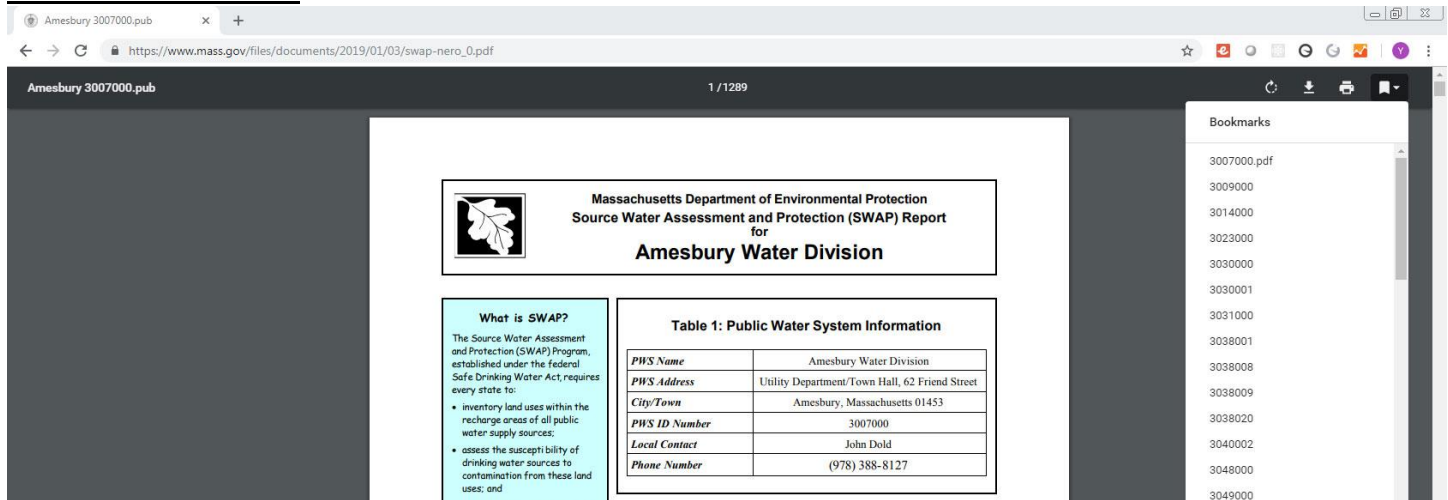


# HOW TO USE THIS PDF FILE

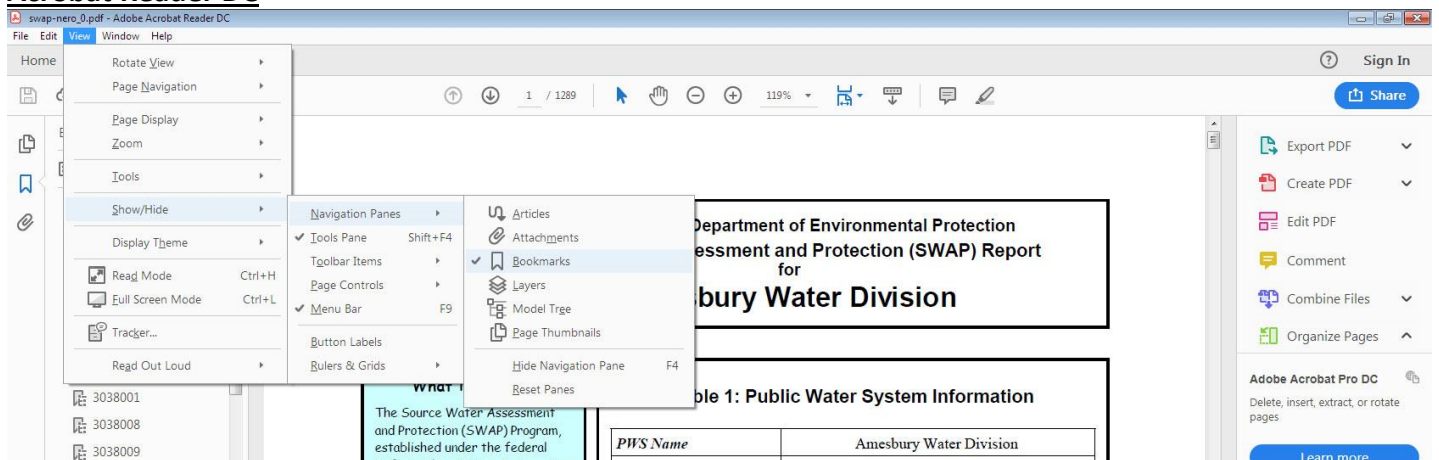
This PDF SWAP report file contains bookmarks which can be used to locate a particular SWAP report (see screenshots below for common PDF programs). The bookmarks are named using the PWS ID # of the public water system.

If you do not know the PWS ID #, you can also perform a search of the document by holding down the “CTRL” (⌘ on Mac) and the “F” key. This will open up the Find functionality. Type the name of the PWS into the textfield provided.

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Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for

Amesbury Water Division

Wh

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

Table 1: Public Water System Information

PWS Name	Amesbury Water Division
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Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for

Wee Forest Folk

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? Inventory land uses within the recharge areas of all public water supply

Table 1: Public Water System (PWS) Information

PWS NAME	Wee Forest Folk
PWS Address	887 Bedford Road
City/Town	Carlisle, Massachusetts 01921
PWS ID Number	3051019



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Adams Fire District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Adams Fire District
<i>PWS Address</i>	3 Columbia Street
<i>City/Town</i>	Adams
<i>PWS ID Number</i>	1004000
<i>Local Contact</i>	Richard Pizani
<i>Phone Number</i>	413-743-0978

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water directly to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*Zone II #: 259*

*Susceptibility: High*

<i>Well Names</i>	<i>Source IDs</i>
Well #2	1004000-02G
Well #3	1004000-03G
Well #4	1004000-04G

Adams is a small, community with a population of approximately 9,500 residents in northwestern Massachusetts. The Hoosic River flows north through the center of town, bisecting the community. The majority of the residential, commercial and industrial development is along the river valley with the remainder of the town consisting of the rolling Berkshire hills, including a portion of the Mount Greylock State Reservation. Adams Fire District maintains three active supply wells located east of Route 8 in the neighboring community of Cheshire. The wells and the recharge area are entirely located in Cheshire. Adams Fire District also maintains the emergency source, Bassett Brook Reservoir and records show an emergency well #1 (which is scheduled to be abandoned); the emergency sources are not addressed in this report. It is recommended that Adams Fire District officially abandon well #1 (Source ID #1004000-01G) as soon as possible. The active wells are located east of Route 8 along the western edge of the Hoosic River and each has a Zone I protective radius of 400-foot.

Bedrock at the well site is mapped as the Kitchen Brook dolomite, a fine-grained massive dolomite with a quartz and calcite-rich region in the upper section. The dolomite contributes to the hardness of the water in the aquifer. The complex bedrock geology of the lowlands and surrounding uplands is mapped as folded and faulted schists, quartzites as well as some marbles and dolomites.

Water from the wells is treated by adding "Calciquest" (blended orthophosphate/polyphosphate compound) to sequester hardness (calcium and magnesium) in the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

The Zone II for Adams' wells was delineated utilizing geological mapping, conceptual, numerical and analytical modelling and approved by the Department in 1996. Hydrogeological parameters were determined using data collected from an extended duration pumping test conducted while developing well #4 in the 1970's. Please refer to the attached map to view the boundaries of the Zone II.

### Section 2: Land Uses in the Protection Areas

The Adams' wells and Zone II are located within the Town of Cheshire, immediately south of the town line. Cheshire is a small rural community and like Adams, the majority of the development and Town center is along the river valley. The remainder of land in the community is rolling hills of forest, residential and agricultural use. The land uses in the Zone II are primarily a mixture of wetlands, forest agriculture and residential with some limited



commercial development (refer to attached map for details). State Route 8 runs north along the edge of the valley through Cheshire into Adams. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

## Section 2: Land Uses in the Protection Areas

The Zone I radius for both wells is 400-feet, and is predominantly owned by the Adams Water District although there is a small area coincident with the bike path (Ashuwillatuck Trail) that is owned by the Massachusetts Department of Environmental Management. The trail which transects the Zone I has an intended use of passive (non-motorized) recreation. Although historically the old rail bed was used by snowmobiles, DEM rules prohibit motorized vehicles on the trail.

Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Residential Land Uses
2. Transportation corridors
3. Agricultural activities
4. Hazardous materials storage and use

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 20% of the Zone II consists of residential areas. While the town of Adams has municipal sewer, Cheshire does not have public sewers and the entire Zone II is served by on-site septic systems. The most significant concentration of septic systems is at the Pine Valley Mobile Home Park. The mobile home park is currently evaluating how to comply with Title 5 septic system requirements for their facility.

There is no clear count of how many residential homes utilize oil versus gas or whether the oil tanks are above or below grade. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

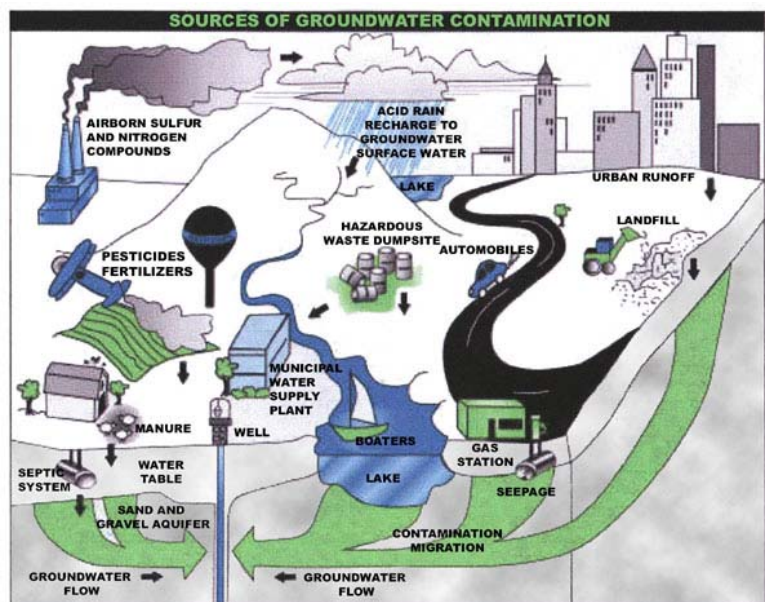
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can also be a potential source of microbial and nitrate contamination.
- **Household Hazardous Materials** - Hazardous materials may include

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) are potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Inventory residential fuel sources and encourage residents to remove any underground tanks and contain all other tanks.
- ✓ Work with planners to manage new residential developments in the water supply protection areas considering density and management of household hazards.
- ✓ Promote BMPs for stormwater management and pollution controls.

**2. Transportation Corridors** - Route 8 runs along the western border of the Zone II, just west of the wells. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to be sure that catch basins are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. Request a copy of the State Highway Department’s schedule for catch basin cleaning and supply them with a copy of the Zone II map.
- ✓ Coordinate with local emergency response teams to ensure they are aware of the boundaries of the Zone II so that any spills within the Zone II be effectively contained and you are notified.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town and State officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

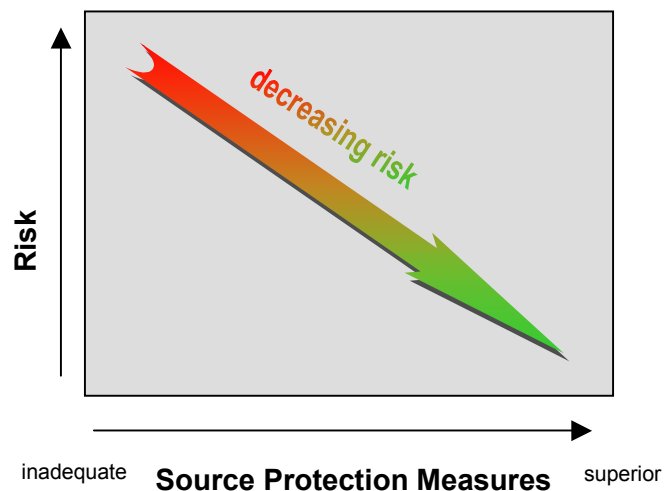


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Pesticide Storage or Use	Numerous	High	Pesticides: leaks, spills, improper handling, or over-application
Crop Lands, Pasture, Manure storage and management	101.2 acres	High	Dairy farm
Fertilizer Storage or Use	Numerous	Moderate	Fertilizers: leaks, spills, improper handling, or over-application
<b>Commercial</b>			
Sand and Gravel Mining/Washing	2	Moderate	Heavy equipment, fuel storage (AST), clandestine dumping: spills
<b>Residential</b>			
Fuel Oil Storage	Numerous	Moderate	Fuel oil, kerosene: spills, leaks, or improper handling (ASTs/USTs)
Lawn Care / Gardening	Numerous	Moderate	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	Moderate	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Underground Storage Tanks	Numerous	High	Stored materials: spills, leaks, or improper handling
Aboveground Storage Tanks	Numerous	Moderate	Materials stored in tanks: spills, leaks, or improper handling

Activities	Quantity	Threat*	Potential Source of Contamination
Aboveground Storage Tanks	Numerous	Moderate	Petroleum products and hazardous materials: spills, leaks, or improper handling
Floor Drains in Commercial/Industrial Facilities	Numerous	High	An inspection of the Zone II found several non-complaint floor drains in facilities where hazardous materials were stored.

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**3. Agricultural Activities** – There are several farms with animals and crop lands within or immediately proximal to the Zone II (the Zone III). Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water sources.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Although the dairy farm is outside of the Zone II it is located within the Zone III. Supply the land owners with maps of the Zone II.

**4. Hazardous materials storage and use** — Many small businesses, municipal facilities and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials in UST/AST. These include a 10,000 gallon UST at the Cheshire School, and a 1000 gallon UST at the First Baptist Church. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Encourage the Board of Health to work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information. Encourage the Board of Health to enforce the local floor drain regulation.

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Other land uses and activities within the Zone II that pose potential threats include the bike path. Although passive recreation poses minimal threat, the use of motorized vehicles poses a more significant threat. Request that DEM enforce their rules for no motorized vehicle access. Monitor activities and report any violations to the DEM. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. The final report of the findings of an Underground Injection Control Inspection is included as Attachment E of this report to help identify some potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

**Section 3: Source Water Protection Conclusions and Recommendations**



**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Maintain current signs. Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988 if needed.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring along bike path and non-water supply activities in Zone Is. Request DEM enforce their rules for access.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	The Cheshire "Aquifer Protection District" bylaw meets DEP's wellhead protection requirements. However, the district does not include the Adams' well Zone II.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Ask Cheshire to bring to Town Meeting a request to expand wellhead protection controls to include Adams' Zone IIs.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Prepare a Wellhead Protection Plan and work with Cheshire to implement.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community. Propose bylaws for Adam's Zone II.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>Partial</b>	For guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Encourage Board of Health to adopt guidelines as a requirement and request guidance on conducting inspections.
Does the PWS provide wellhead protection education?	<b>NO</b>	Work with Cheshire to continue and expand the public education program.

### Current Land Uses and Source Protection:

As with many water supply protection areas, the system's Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Passing wellhead protection bylaws to protect the land areas near the Cheshire Water Department wells.
- Implementing a Public Education program on wellhead protection.
- Working with the board of Health to pass floor drain regulations.
- Installing fencing to prohibit access to the Zone I.

### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with the Town of Cheshire to bring a proposal to Town Meeting to pass wellhead protection bylaws and request that the Board of Health include floor drain regulations to protect the Zone II for Adams' wells located in Cheshire.
- ✓ Inspect the Zone I and Zone II regularly.
- ✓ Abandon the old, emergency source, #1004000-01G.
- ✓ Request that DEM enforce their rule prohibiting motorized vehicle access on the bike path.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Notify Massachusetts Highway Department regarding the location of the Zone II and coordinate with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Contact farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

### Resources for Drinking Water Source Protection:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and

### For More Information

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.

2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

### Conclusions:

The assessment and protection recommendations in this SWAP report are

provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection
- E. UIC Report for the town of Cheshire



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Amherst DPW Water Division**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Amherst DPW Water Division
<i><b>PWS Address</b></i>	586 South Pleasant Street
<i><b>City/Town</b></i>	Amherst
<i><b>PWS ID Number</b></i>	100800
<i><b>Local Contact</b></i>	Mr. Robert Pariseau
<i><b>Phone Number</b></i>	413-256-4050

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

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### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

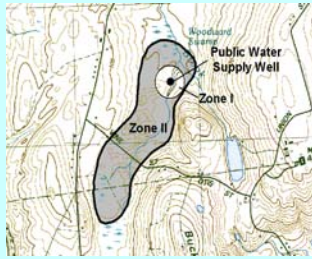
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### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

### Groundwater Sources Zone II #: 208

*Susceptibility: High*

<i>Well Name</i>	<i>Source ID</i>
Well #1	1008000-01G
Well #2	1008000-02G
Well #3—Brown Well	1008000-03G
Well #4—Baby Carriage Brook	1008000-04G
Well #5	1008000-06G
Well #6	1008000-07G

### Surface Water Sources

*Susceptibility: High*

<i>Reservoir Name</i>	<i>Source ID</i>
Hawley—Hills (Pelham) Reservoir	1008000-01S
Atkins Reservoir	1008000-02S

Amherst is a mid-sized, rural community in western Massachusetts that is the home to the main campus of the University of Massachusetts and two private colleges. The population and consequently the water demands, fluctuate with the academic seasons. The Town of Amherst maintains two main surface water sources (the Atkins Reservoir and the Pelham Reservoir) and five groundwater sources (Wells #1 through #5) to meet their water needs. Wells #4 and #5 are used primarily to meet seasonal high demand. One additional proposed groundwater source (Well #6) has been tested and approved, however since final construction of the pumping and treatment facilities has not been completed, that source is currently not available for use.

The surface water supplies are located in the foothills of the central highlands in the rural communities of Pelham and Shutesbury. The watersheds are underlain primarily by metamorphic bedrock underlain by thin till. Small deposits of sand and gravel are noted in the immediate vicinity of the reservoirs. The Pelham Reservoir is comprised of the Hills and Hawley Reservoirs and a small intake reservoir. Water from the surface water supplies is treated through conventional filtration plants at the Centennial and Atkins Treatment Plants. The plants utilize flocculation, sedimentation and filtration. Chloramination is utilized to disinfect the water, sodium hydroxide is added for pH adjustment, and fluoride is added prior to distribution. The Atkins plant also has ozone and granular activated carbon available for additional treatment as required.

The wells for the Amherst DPW Water Division are located in the Lawrence Swamp/Hop Brook Basin in South Amherst. Each of the wells has a Zone I of 400 feet. The wells utilize water from a confined to semi-confined, sand and gravel aquifer located within a buried, bedrock valley. The bedrock valley, comprised primarily of metamorphic and sedimentary rocks, was deepened by advancing glaciers and later filled in with sand and gravel from the receding glaciers and overlain by silt and clay from glacial Lake Hitchcock and Lake Lawrence some 18,000 years before present. Recent alluvial deposits cover the entire valley area. The confining clay layer is primarily contiguous through the center of the buried valley with the clay layer pinching out toward the edges of



the aquifer allowing significant recharge along the basin boundaries. The wells are of various depths ranging from approximately 57 feet along the valley walls to 168 feet below grade in the center of the valley.

Wells #1, #2, #3 and #5 are located along the perimeter of the basin where the silt and clay units are discontinuous and inter-fingered with sand and gravel deposits resulting in a semi-confined aquifer. This type of aquifer has a high vulnerability to contamination due to the absence of a continuous hydrogeologic barrier (i.e. clay) that can prevent contaminant migration. Wells #4 and #6 are located in the confined portion of the aquifer. This type of aquifer has low vulnerability to contamination due to the presence of the hydrogeologic barrier (i.e. clay) that can prevent contaminant migration. Specific information about the wells is as follows:

The Zone II for these wells was delineated based on conceptual, numerical and analytical modeling with aquifer parameters determined from multiple, extended duration pumping tests. The Zone II was delineated as part of the New Source Approval Process and Water Management Act requirements for the development of Well #6 and increased withdrawal of existing wells. Please refer to the attached map to view the boundaries of the Zone II.

### Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

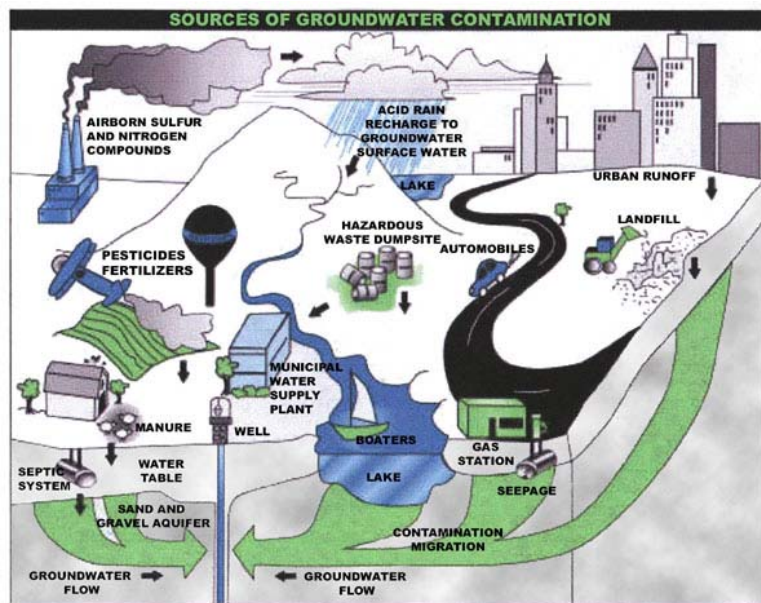
**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

For current information on water quality monitoring results and treatment processes, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Amherst's wells is a mixture of residential, agricultural, and some light commercial and industrial areas (refer to attached map for details). The land uses in the watersheds is rural, low density residential. The most significant threat to the surface water supplies is from natural, microbial threats from beavers. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Tables of Regulated Facilities and Underground Storage Tanks attached in Appendix B.



### Key Land Uses and Protection Issues include:

1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Protection Planning
6. Agricultural activities
7. Railroad Right of Way
8. Presence of Beavers in Surface Water Sources

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Nonconforming Zone I** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water

regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone I for Wells #1 and #2 is not entirely owned by the town. There is a railroad right-of-way and a bike path running through the Zone I, and a portion of the Zone I for Well #1 includes a hayfield. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

#### Zone I Recommendations:

- ✓ Obtain a Right of First Refusal for acquiring the land within the Zone I currently not owned by the town.
- ✓ Consider purchasing the land or acquiring a conservation restriction on the land to minimize potential threats.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I. ✓
- ✓ Contact the property owner to be sure they are aware they are within the Zone I and Zone II of the well. Provide information about BMPs.

**2. Residential Land Uses** – Approximately 14% of the Zone II consists of residential areas. The Zone C has about 4% of the land use as residential. From this perspective, residential land uses are more of a potential threat within the Zone II than in the Zone C areas. None of the areas have public sewers; all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. There are some residential uses within the Zone A of the reservoirs as well. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include

automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

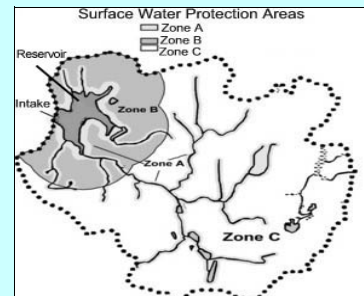
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal

### Source Protection Decreases Risk

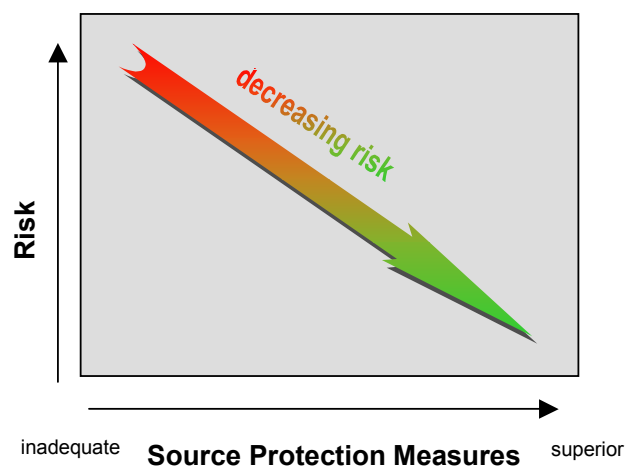


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Protection Zone	Potential Contaminant Sources*
<b>Agricultural</b>				
Dairy Farms	1	Moderate	Zone II	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	Numerous	Moderate	Zone II	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	4	Moderate	Zone II	Manure (microbial contaminants): improper handling [2 horse farms, 1 emu farm, 1 rabbit farm]
Nurseries	1	Moderate	Zone II	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application [1 Greenhouse]
Pesticide Storage or Use	Numerous	High	Zone II	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Gas Stations	1	High	Zone II	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	1	High	Zone II	Automotive fluids and solvents: spills, leaks, or improper handling
Railroad Tracks	1	High	Zone I (Well 1 & 2) Zone II	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	1	Moderate	Zone II	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Industrial</b>				
Fuel Oil Distributors	1	High	Zone II	Fuel oil: spills, leaks, or improper handling or storage
Hazardous Materials Storage and Waste Storage	Numerous	High	Zone II	Hazardous materials: spills, leaks, or improper handling or storage
<b>Miscellaneous</b>				
Aboveground Storage Tanks	Numerous	Moderate	Zone II	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Numerous	Low	Zones A & C	Microbial contaminants
Farm Composting Facilities	1	Low	Zone II	Organic material, animal waste, and runoff: storage and improper handling
Small quantity hazardous waste generators	1	Moderate	Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	Low	Zone C Zone II	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	Moderate	Zone C Zone II	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	1	High	Zone II	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	3	Low	Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage

Land Uses	Quantity	Threat	Protection Zone	Potential Contaminant Sources*
<b>Residential</b>				
Fuel Oil Storage (at residences)	Few	Moderate	Zones C Zone II	Fuel oil: spills, leaks, or improper handling (All USTs in Amherst removed, unknown in Belchertown)
Lawn Care / Gardening	Numerous	Moderate	Zones C Zone II	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	Moderate	Zones C Zone II	Hazardous chemicals: microbial contaminants, and improper disposal

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**Potential Source of Contamination vs. Actual Contamination**

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

(BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Continue catch basin cleaning routines.

**3. Transportation Corridors** - Route 9 runs through part of the Zone II, and local roads are common throughout the Zone II, Zone A and Zone C. The transportation corridors are more heavily traveled in the Zone II than in the Zone C, and are therefore a greater threat in the Zone II; however, it is equally important to use best management practices in both areas. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that



drains discharge stormwater outside of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Hazardous Materials Storage and Use** – A very small percentage (<1%) of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**5. Protection Planning** – Forested land covers 64% of the Zone II and 34% is protected open space for the District. Amherst has worked diligently to pass bylaws that are in compliance water supply protection control regulations 310 CMR 22.21(2), including the floor drain prohibitions. However, Belchertown has

**Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



not passed protective bylaws for the Lawrence Swamp Zone II area.

A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public education and outreach. The development of a successful Wellhead Protection Plan is outlined in five steps in DEP's “Developing a Local Wellhead Protection Plan” (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Wellhead Protection Area
- Identify potential sources of contamination
- Protect and manage the wellhead protection area
- Conduct ongoing public education and outreach

Although Amherst has the majority of the components for a Wellhead Protection Plan in place, they do not have a formal plan. Please use the guidance booklet “Developing a Local Wellhead Protection Plan” to help you find what Amherst is missing. Compile the information supplied in the Zone II reports, this and other reports; include copies of maps outlining the Zone II and detail the protection measures in place. Outline a plan to complete any components of the plan not in place with a time line for completion. Submit your written report to the DEP Regional office and/or Boston office for approval.



Amherst is currently working with their consultant to prepare Watershed Protection Plans for the surface water supplies. Amherst owns 25% of the Atkins Reservoir watershed and 38% of the Pelham Reservoir watersheds. Forested land covers 91% of the watershed lands and 38% of the watersheds are protected open space.

#### **Protection Planning Recommendations:**

- ✓ Formalize the Wellhead Protection Plan. Refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan" (see Appendix A).
- ✓ Continue to work with Belchertown to adopt protective bylaws and regulations for Lawrence Swamp Zone II. The Department will be instrumental in assisting Amherst in this effort.

**6. Agricultural Activities** – There are several farms on the western edge of the Zone II. Crop and pasture lands make up about 16% of the land use in Zone II, 2% in the Zone C. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

#### **Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

**7. Railroad Right-of-Way** – The railroad runs through the entire Zone II, and transects the Zone I of wells #1 and #2. Rail corridors that serve passenger and/or freight trains are a potential source of contaminant due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of a railroad right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on railroad right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train/track maintenance

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

Land uses within the Zone III are not assessed for SWAP reports unless the source is under the direct influence of groundwater.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

chemicals are also potential sources of contamination to the water supply.

#### **Railroad Right of Way Recommendations:**

- ✓ Review the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the railroad rights-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

**8. Presence of Aquatic mammals in Surface Water Watershed** – There is evidence and past history of aquatic mammals (beavers and muskrats) living in and near the surface water supplies. Aquatic mammals pose a potential threat of microbial contamination of the source from *Giardia Lamblia* and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water.

**Presence of Beavers in Surface Water Sources Recommendations:**

- ✓ Monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake. Monitor raw water quality and assess potential impacts.

Other land uses and activities within the Zone II that have potential for contamination include auto repair shops, gas stations, large equipment storage, and a greenhouse. Refer to Table 2 and Appendix 2 for more information about these land uses.

As previously noted, the Zone II has a confining clay layer which pinches out toward the edges of the aquifer allowing significant recharge along the basin boundaries. This allows for the majority of the recharge to the aquifer to occur through the Zone III. In this instance, identifying potentially threatening land uses within the Zone III is equally important to those in the Zone II. It would be in the best interest of Amherst Water Division to consider the recommendations outlined in this report for both the Zone II and Zone III areas.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply.

**Section 3: Source Water Protection Conclusions and Recommendations****Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Implementing a hazardous waste collection plan
- Removing most of the USTs within the Zone II associated with businesses and residences
- Establishing source protection committee and implementation of protection measures.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watersheds when responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

**Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I and Zone C</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I/Zone As?	<b>NO</b>	Majority of Zone I and Zone A are owned. Follow and educate land owners about Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Include strategy for additional land acquisition as appropriate.
Is the Zone I and Zone C posted with "Public Drinking Water Supply" or other signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I and watershed regularly inspected?	<b>YES</b>	Continue frequent inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I/Zone A?	<b>YES</b>	Allowable Passive Recreation (Bike Path) within the Zone I of Well #1 and #2. Residential development in Zone A. Continue monitoring non-water supply activities.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>YES</b>	The Town "Aquifer Protection District" bylaw meets DEP's requirements in Amherst. Amherst meets best efforts for wellhead protection in Belchertown. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II/Zone C areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include Zone II/Cs in source protection controls.
<b>Planning</b>		
Does the PWS have Wellhead/Watershed Protection Plans?	<b>YES</b>	Implement the watershed protection plans and formalize your wellhead protection plan. Work with communities where watersheds are located to enhance local protection.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead/watershed protection committee?	<b>YES</b>	Continue committee work. Include representatives from citizens' groups, neighboring communities where watersheds are located and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> .
Does the PWS provide source water protection education?	<b>YES</b>	Continue and expand educational efforts.

**Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection



# Source Water Assessment Program (SWAP) Report

## For

### Ashfield Water District

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 14, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Ashfield Water District
<i>PWS Address</i>	412 Main Street
<i>City/Town</i>	Ashfield, Massachusetts
<i>PWS ID Number</i>	1013000
<i>Local Contact</i>	Mr. Peter Johnson
<i>Phone Number</i>	413-628-3297

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1013000-01G	332	1,187	High
Well #2	1013000-02G	330	1,158	High

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

#### 1. Description of the Water System

Ashfield is a small, rural, agricultural/residential community located in southwestern Franklin County in the foothills of the Berkshire Hills. Ashfield Water District maintains water supply Wells #1 and #2 that provide water to the center of town and the Ashfield Lake area. The District also maintains a surface water reservoir as an emergency source that will not be addressed in this assessment. Some water from the reservoir is directed to an area near the old storage tank, discharging to a channel maintaining a minimum flow in a brook adjacent to Well #1. The wells are both bedrock wells drilled to depths of 400 and 440 feet, respectively, and have approved



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

withdrawal rates of 24.6 and 23.7 gallons per minute based on continuous rate pumping tests. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 332 feet and 1,187, respectively for Well #1 and 330 feet and 1,158, respectively for Well #2. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The wells are located within a bedrock aquifer with relatively thin till covering. The predominant bedrock is mapped as highly contorted schist with granofels, marble or quartz of the Waits Formation. There is no record indicating a confining, protective clay layer or artesian conditions in the vicinity of the wells. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

Water from the Ashfield wells does not require and does not have treatment at this time. However, the District does have the capability to chlorinate water from the wells if it is necessary. For current information on water quality monitoring results, please refer to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Zone I ownership**
2. **Transportation corridors**
3. **Residential uses**
4. **Hazardous materials**

The overall ranking of susceptibility to contamination for the system is high based on the presence of at least one land use or activity ranked as high in the Zone I and IWPA of the wells, as seen in Table 2.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridors	Well # 1	Both	Moderate	Limit road salt usage and provide drainage away from wells
Residential use	Well #1	Both	Moderate	Septic and household hazardous materials
Hazardous materials	Well #1	Both	High	Chemicals, lawn equipment and Small Quantity Generator
Livestock operations (noncommercial)	Well #1	Well #1	High	Manure and household hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/den/hrn/dws/](http://www.state.ma.us/den/hrn/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Non-conforming Zone I** – Currently, the water supplier does not own or control the entire Zone I area for Well #1. There is a residence and the associated farm within the Zone I of Well #1. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The water supplier owns or controls through a Conservation Restriction the entire Zone I for Well #2.

### Recommendations:

- ✓ Control access to the wellhead area and make every effort to acquire Zone I control or ownership.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store petroleum products, pesticides, fertilizers or road salt within the Zone I.
- ✓ The Water District should continue to monitor activities at the residence to assure that BMPs are used at the facility. If the facility becomes commercial in nature, consult with the NRCS to determine if assistance is available to mitigate problems if they ever arise. Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).

**2. Residential Land Uses** – The protection areas have a few residences within them. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and at [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

### 3. Transportation Corridors and Utility Right-of-Ways

There are roads located within the Zone I of Well #1 and within the IWPA of both wells. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater. Roadways can often be sites for illegal dumping of hazardous or other potentially harmful wastes.

Catch basins and drainage swales transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include

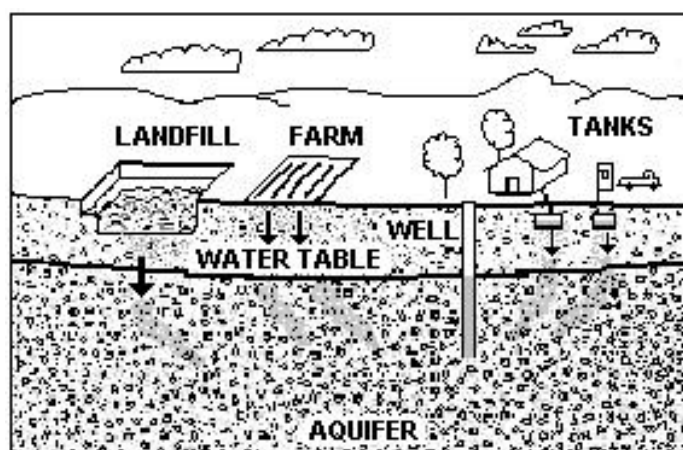


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

contaminants from automotive leaks, maintenance, washing, pesticides and fertilizers or accidental spills.

There is one utility Right-of-Way within the IWPA for Well #1 and within close proximity to the IWPA for Well #2. Continue your current practice of reviewing the Yearly Operational Plan (YOP) of the utility and meet with them to review the locations and maps of their easements for accuracy. Be sure that they contact you regarding changes in maintenance of the right-of-way.

### Transportation Corridor Recommendations:

- ✓ Regularly inspect Zone Is and IWPA's for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained and be sure that team is aware of the protection areas.
- ✓ Where catch basins are installed, work with the municipality or State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff. For information on DEP's S. 319 Nonpoint Source Competitive Grants Program and upcoming funding opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ Storm Drain Stenciling Program - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. Smaller communities may not have maps available. Work with town officials to investigate mapping options. The NPDES Phase II Stormwater Rule requires some communities to complete stormwater mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the utility right of way Yearly Operating Plans (YOPs) to ensure that water supplies are protected during vegetation control or maintenance of the utility.
- ✓ Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Rita Thibodeau, at the local office (Greenfield at 413-772-0384 - e-mail address is [rita.thibodeau@magreenfie.fsc.usda.gov](mailto:rita.thibodeau@magreenfie.fsc.usda.gov)). Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**4. Hazardous Materials Storage and Use** – The storage tank and motor control building for the District is located immediately adjacent to Well #1. The building is utilized to store equipment for the District including lawn mowers and associated petroleum products. The company, Harris & Gray Contractors a Small Quantity Generator of hazardous materials is located within the IWPA of Well #2. If hazardous materials are improperly stored, used, or disposed, they become potential sources of

contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground. All petroleum products should be stored away from the well. Any products utilized by the water supplier should be kept in secondary containment to avoid accidental release.

### Hazardous Materials Storage and Use Recommendations:

- ✓ Remove equipment and petroleum products not directly related to supplying water.
- ✓ Provide secondary containment for all products that are required and minimize the amount of product stored on site.
- ✓ Request that the Board of Health adopt a hazardous materials handling regulation.
- ✓ Closely monitor deliveries of chemicals.

Other activities that have been identified in the protection areas were a beaver swamp located topographically downgradient of Well #2 but within the IWPA and farming. Beaver swamps may flood wellhead areas causing a potential threat from bacteria and viruses. Monitor the beaver activity to be sure that the ponding does not encroach on the wellhead. The residential home with a small livestock operation is within the Zone I and IWPA of Well #1. The residence appears to be located topographically downgradient from the wellhead so that runoff is directed away from Well #1. The Water District should monitor activities at the residence to assure that BMPs are used at the facility. If the facility is commercial in nature, consult with the NRCS to determine if assistance is available to mitigate problems if they arise. Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Rita Thibodeau, at the local office (Greenfield at 413-772-0384 - e-mail address is [rita.thibodeau@magreenfie.fsc.usda.gov](mailto:rita.thibodeau@magreenfie.fsc.usda.gov)). Review the fact sheet available online at the website <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Ashfield is commended for its current high level of awareness of activities in the protection area and efforts to secure a conservation restriction for the Zone I of Well #2. Ashfield should continue efforts to protect water supplies by reviewing and adopting the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Review use and storage of hazardous materials stored in the Zone I of Well #1.
- ✓ Work with Ashfield to adopt bylaws/regulations to protect water supplies such as hazardous materials handling regulations, floor drain regulations and water supply protection area Zoning Bylaws.
- ✓ Review the Wellhead Protection Plan prepared in the early 1990s and update the plan as appropriate. Include Town Boards, other water suppliers in Ashfield and local citizens in the protection planning process. Review the attached guidance for wellhead protection planning.

#### Zone I:

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ When feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Continue to prohibit public access to the well and control building by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If the District intends to continue utilizing the structures in the Zone I for storage of equipment, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction or Memorandum of Understanding (MOU) that would prohibit potentially threatening activities or a Right of First Refusal agreement to purchase the property.
- ✓ Redirect road drainage in the Zone I away from the well.
- ✓ Do not use or store pesticides, fertilizers, petroleum products or road salt within the Zone I.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations as appropriate.
- ✓ Incorporate groundwater education into the local school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff near Well #1 is directed away from the well and is treated according to DEP guidance.

#### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Upgrade any oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Concrete pads around wellheads should slope away from the wells and well casings should extend above ground.

- V For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- V Work with local officials in Ashfield to develop **Aquifer Protection District Bylaws** and include the IWPA areas for the District wells and other public water supplies wells in Ashfield to assist in improving protection for all PWSs.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead and Source Water Protection Grant Programs provide funds to assist public water suppliers in addressing protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the grant programs. Please note: each program year, if funds are available, the Department posts a new Request for Response for the grant program (RFR) at <http://www.mass.gov/portal/index.jsp?pageID=aghome&agid=osd>. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

The Massachusetts Department of Food and Agriculture's Agricultural Environmental Enhancement Program (AEEP) provides funding to farmers to install a variety of water quality protection practices. For more information on the program contact the coordinator, Susan Phinney, at (617) 626-1772, [Susan.Phinney@state.ma.us](mailto:Susan.Phinney@state.ma.us).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Consider reviewing the fact sheet available online and call the local office Amherst 413-253-4350 of the NRCS for assistance at the following website <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheets
- Other Source Protection information



# Source Water Assessment Program (SWAP) Report

## For

### Sanderson Academy



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
March 29, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	<b>Sanderson Academy</b>
<i>PWS Address</i>	<b>808 Cape Street</b>
<i>City/Town</i>	<b>Ashfield, Massachusetts 01330</b>
<i>PWS ID Number</i>	<b>1013001</b>
<i>Local Contact</i>	<b>Principal, Ms. Anne Marie Mislak</b>
<i>Phone Number</i>	<b>413-628-4404</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1013001-01G	255	640	Moderate

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

#### Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting or storage, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to you or your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attached Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

#### Well #1

Sanderson Academy has a total staff and student population of approximately 250 people and is located in a rural setting surrounded primarily by woodland, wetland, rural residential and agricultural land uses. Well 1 is the sole source of water for the school. The well is located on a wooded parcel of land, approximately 700 feet south of Spruce Corner Road and 1,100 feet west of Route 112. A brook and wetland are adjacent to the well with a fire pond approximately 200 feet from the well. The Zone I protective radius for Well #1 is 255 feet and the Interim Wellhead Protection Area (IWPA) radius is 640 feet. The well was developed and tested under the DEP's New Source Approval Process in 1995 at a pumping rate of 10 gallons per minute (gpm). The Zone I and IWPA protective radii are based on the well's approved safe yield of 7.5 gpm (10,800 gallons per day). Please refer to the attached map that shows the Zone I and IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 is a 6-inch diameter well drilled to a final depth of 380 feet with steel casing grouted from ground surface to 105 feet below ground; 23 feet into solid bedrock. Bedrock was encountered 83 feet below ground however the drilling logs do not describe the nature of the overburden material drilled through before hitting the bedrock. Bedrock geologic mapping of the area indicates the bedrock is micaceous, quartz/quartzite schist of the Goshen Formation, and that the site is close to the contact between the Goshen and Waits Formation, which is also schist. The pump is set approximately 310 feet below ground. The driller recorded water-bearing zones at 111 feet, 169 feet and 289 feet below ground; under static (non-pumping) condition water freely flowed out of the top of the casing. Following completion of the well, a hole was drilled in the side of the casing to allow the overflow to freely flow out onto the ground. Recently a pitless adapter and casing drain were installed to eliminate the free flowing water onto the ground. The ground around the wellhead was raised and graded away from the casing to eliminate ponding of water near the wellhead. The School has applied for and received a Wellhead Protection Grant from the Department to install a wellhouse and fencing around the wellhead to prevent access and conduct other system modifications.

The sanitary seal around the wellhead, the relatively deep overburden and the flowing artesian condition of the well provide some protection from potential surface sources of contamination. However, there is no evidence of a clay layer or significant barrier to contaminants. Bedrock wells drilled in these conditions are considered to be moderately vulnerable to potential contamination from the ground surface.

### Water Quality

The Sanderson Academy well water does not require and does not have treatment at this time. For current information on monitoring results, please contact the Principal, Ms. Anne Marie Mislak listed above.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are very few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The school's current operator is diligent in monitoring activities that may pose a threat to the school's water supply. The water source for the school is generally well protected. Please refer to Table 2.

**Table 2: Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Agricultural activities	No	Yes	Moderate	Haying and cattle grazing within the IWPA has minimal threat to the water quality provided they are properly managed. Monitor activities.
	School and Recreational Activities	No	Yes	Low	Continue policy of no fertilizer or pesticide usage. Passive recreation.
Highway Department	Covered Municipal Salt Shed	No	No	Moderate	Although the shed is outside of the IWPA, runoff may flow past the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Key issues include:

1. Agricultural activities
2. The Town's Salt Shed is topographically upgradient from the well

Currently, there are no non-conforming activities within the Zone I. The overall susceptibility ranking of the well to contamination is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA.

1. **Agricultural activities** – The wet meadow, south and east of the well is hayed and sometimes used for animal grazing. Haying poses minimal threat to the water quality, provided that no fertilizers or soil enhancers are used. Although, animal grazing poses a more significant potential threat, animals are kept outside of the Zone I and surface water drainage from the wet meadow flows away from the well.

✓ **Recommendation** - The school must be diligent in ensuring grazing is kept outside of the Zone I and buffers are maintained along the surface waters to protect water quality.

2. **Town's Salt Shed** – The aerial photograph (map) attached to this report was taken in 1997. Therefore the salt shed does not appear on the photograph. The shed is located south of the well, just outside of the IWPA at the end of the long driveway that does appear on the map.

Although the salt shed is covered and the tarmac is paved, there is no drainage control at the facility. The site visit for the assessment was conducted in the winter, and significant runoff from the site was observed flowing off of the tarmac toward the wetland to the north. The potential threat from the covered salt shed would be minimal provided the runoff from the site is controlled. However, the current conditions pose a potential threat to the well from runoff. Additional concern regarding the facility comes from the potential storage of vehicles or equipment at the facility. Release of hydraulic fluid, fuel or other petroleum products from the loaders and sanders should be monitored and controlled. Careful consideration must be made of the activities conducted within the IWPA and adjacent land that may impact the well.

✓ **Recommendation** - The IWPA provides interim protection for a water supply well but the actual recharge area to the well may be significantly larger or smaller. Therefore, the Town should carefully consider the activities conducted in the vicinity of the well, prohibit those that pose a significant threat to the public water supply and use Best Management Practices and controls for those activities that are allowed in this area.

The Department can offer technical assistance to the Town to determine what types of activities should be prohibited and/or controlled within close proximity to the well and the Best Management Practices that should be employed for those activities that will be allowed.

Other activities noted during the assessment:

A small portion of the school and recreational fields are within the IWPA of the well. Generally, schools pose a moderate threat. However, due to the distance from the well, the fact that no

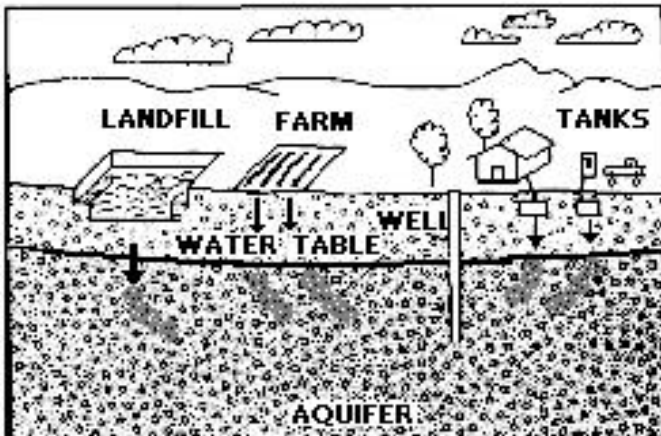


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### **For More Information:**

Contact Catherine V. Skiba at DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

fertilizers or pesticides are used on the lawns, the relatively thick overburden and (static) upward gradient in the aquifer, the recreational activities represent a low potential threat to the well.

There is also low-density, residential use within the vicinity of the school well. In general, normal residential activities pose a low threat to public and private water supplies. The use of best management practices minimizes the potential threats to both private and public wells. Therefore, the Town should encourage and educate Town residents in the judicious use and management of pesticides and petroleum products, maintenance of septic systems and management of animal manure.

Implementing the following recommendations will help minimize the system's susceptibility to contamination.

### **3. PROTECTION RECOMMENDATIONS**

The Sanderson Academy and Town of Ashfield should review and adopt the following recommendations.

#### **Zone I and IWPA:**

- ✓ Secure the wellhead area with a fence.
- ✓ Contain or control all materials that could pose a potential hazard to public water supplies.

- ✓ Control the runoff from the salt shed.
- ✓ Restrict animal grazing to outside of the Zone I and maintain buffers along wetlands and waterways. Attached are several fact sheets regarding pasture and manure management. Although these fact sheets were prepared primarily for family or hobby horse owners, the information is general in applicability.
- ✓ Work with the Selectmen, Board of Health and Planning Board to monitor land uses within and proximal to the IWPA. Refer to the Wellhead Protection Plan guidance and the model bylaws for types of activities that should be prohibited and managed in the vicinity of public or private water supplies.
- ✓ Post drinking water protection area signs at key visibility locations of the Zone I.
- ✓ Keep all non-water supply activities out of the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I and IWPA. Look for illegal dumping and evidence of vandalism.

#### **Training and Education:**

- ✓ Train staff on proper hazardous material use, storage, use, disposal, emergency response, and best management practices. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training. To learn more, see the hazardous materials guidance manual at [www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm](http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm). Also contact Hilary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us).
- ✓ Arrange to have potentially hazardous materials (i.e. floor stripping residuals) disposal available for the school staff, primarily the custodial staff, either through the Town's hazardous waste collection days or through other means. The school may have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials.
- ✓ Incorporate groundwater education into the school's curriculum (K- Grade 6 curricula available from DEP; DEP can suggest other agencies' curricula as well).

#### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, handling, use and disposal of potentially hazardous materials.
- ✓ Septic system components should be inspected and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Due to the age of the school it is highly improbable that PCBs are present, however the fluids required in the transformers are oils. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in Ashfield to assist you in improving and maintaining protection of the school's water supply.
- ✓ It is recommended that the Town consider zoning bylaws to protect the public water supply area for the school. Refer to the Department's model bylaws for examples of activities that should be prohibited within the Wellhead Protection Areas and those that should be restricted or controlled. Utilize BMPs where appropriate.
- ✓ Prepare a Wellhead Protection Plan and Emergency Response Plan to address short-term water shortages, long-term water demands and management. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional, new information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion to promote local drinking water protection measures for all public and private water supplies.

**Attachments:**

- Map of the Public Water Supply (PWS) Protection Area.
- Septic System Brochure
- Developing a Local Wellhead Protection Plan
- Summary of Recommended Source Water Protection Measures
- The Very Small Quantity Generator of Hazardous Waste – Fact Sheet
- One Day Hazardous Waste Collections - Fact Sheet
- Fact Sheets – References for pasture and manure management

**Additional Reference Documents:**

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- Water Supply Protection Guidance Materials such as model regulations,
- Best Management Practice information, and general water supply protection information.
- MA DEP SWAP Strategy
- Land Use Pollution Potential Matrix
- Draft Land/Associated Contaminants Matrix





**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**for**  
**Athol DPW, Water Division**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Athol DPW, Water Division
<i><b>PWS Address</b></i>	584 Main Street, Room 24
<i><b>City/Town</b></i>	Athol, Massachusetts
<i><b>PWS ID Number</b></i>	2015000
<i><b>Local Contact</b></i>	Douglas Walsh
<i><b>Phone Number</b></i>	(978) 249-4542

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### **Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

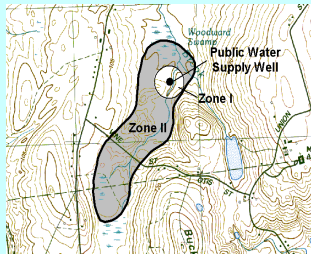
#### **This report includes the following sections:**

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

#### Zone II #: 469

*Susceptibility:* High

Well Names	Source IDs
South Street Well #1	2015000-01G

#### Zone II #: 406

*Susceptibility:* High

Well Names	Source IDs
Tully Well #1	2015000-02G
Tully Well #2	2015000-03G
Tully Well #3	20154000-04G

The town of Athol gets its water supply from four wells. One well, the South Street well was installed along the Millers Rivers in 1961. The well is located off South Street just southwest of downtown Athol. The well is an 18-inch diameter, gravel packed well installed to a depth of 90 feet below grade. The other three wells, the Tully Brook wellfield are located off Pinedale Street also in the Town of Athol, adjacent to the West Branch of the Tully River. Each well has a Zone I of 400 feet. According to a Bedrock Geologic Map of Massachusetts, the area near the South Street is underlain by massive biotite-plagioclase gneiss, amphibolite and microcline augen gneiss. The area is characterized by extensive kame and kame terrace deposits. These deposits were created by the action of meltwater streams within and beside glacial ice. The study area is composed of predominantly fine-grained, relatively homogeneous soil units. Specifically, the surficial material consists of fill, fine to coarse sand, silt to very fine sand and till. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Water from the South Street well is treated through a GAC contactor system consisting of three pressure type carbon contactor vessels. Following carbon treatment, chlorine is added for disinfection, sodium hydroxide is added to adjust the pH, orthophosphate is added for corrosion control, fluoride is also added. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

## Section 2: Land Uses in the Protection Areas

The Zone IIs for Athol is a mixture of residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, for all the wells, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Inappropriate Activities in Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Of the four (4) Zone Is for the wells, only one of the Zone Is (01G) is owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

**Zone I: South Street Well 2015000-01G** - The well has been in operation since the early 1960s. The Zone 1 contains a pond, where fishing and boating occur.

**Zone 1: Tully Wells 02G, 03G & 04G**– The owner does not own or control the Zone 1s for these wells. These wells are located adjacent to Tully Brook where fishing occur.

#### Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such

as water supply chemicals and maintenance chemicals.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

**2. Residential Land Uses** – Approximately 35% of the Zone IIs consist of residential areas. Only some of the areas have public sewers, so all homes use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

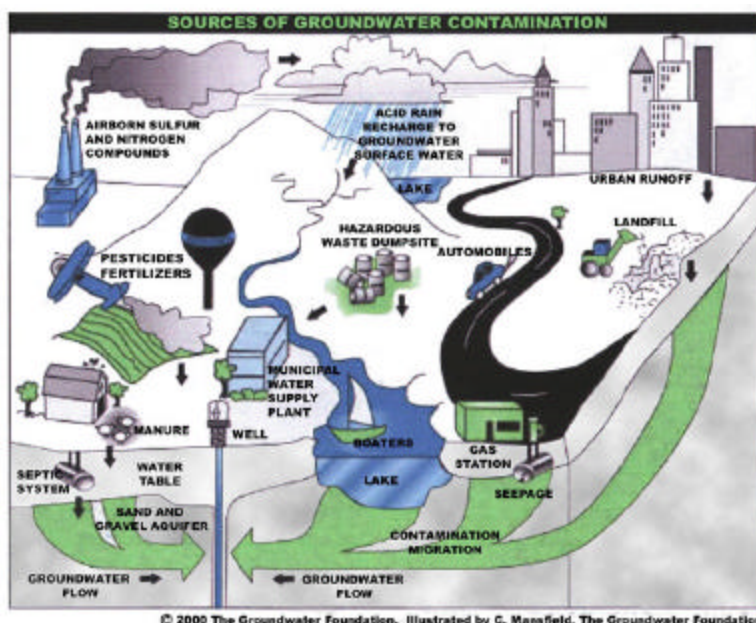
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

2A and Route 32 run through the Zone IIs. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

#### 4. Hazardous Materials Storage and Use –

Approximately thirteen (13) percent of the land area within the Zone II is commercial or industrial

(Continued on page 7)

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

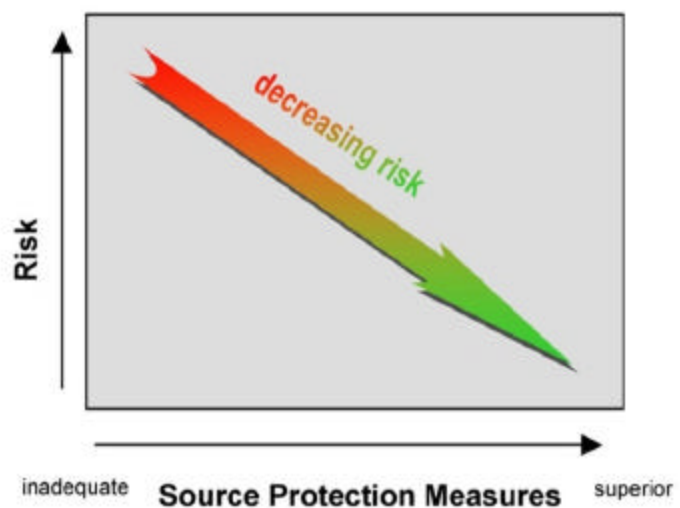


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Zone 11 #	Threat*	Potential Source of Contamination
<b>Commercial</b>				
Car/Truck/Bus Washes	2	469	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Body Shops	2	469	H	Vehicle paints, solvents, and primer products: improper management
Gas Stations	4	469	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	3	469	H	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders		469	H	Fuels, paints, and solvents: spills, leaks, or improper handling
Cemeteries	2	469	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	469	H	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	2	469	L	Hazardous chemicals: spills, leaks, or improper handling
Laundromats	1	469	L	Wash water: improper management
Medical Facilities	1	469	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Photo Processors	1	469	H	Photographic chemicals: spills, leaks, or improper handling or storage
Printer And Blueprint Shops	3	469	M	Printing inks and chemicals: spills, leaks, or improper handling or storage
Railroad Tracks And Yards	---	469	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or
Repair Shops (Engine, Appliances,	1	469	H	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Research Laboratories	1	469	M	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage



Activities	Quantity	Zone II #	Threat*	Potential Source of Contamination
<b>Industrial</b>				
Chemical Manufacture Or Storage	4	469	H	Chemicals and process wastes: spills, leaks, or improper handling or storage
Electroplaters	1	469	H	Solvents and other chemicals: spills, leaks, or improper handling or storage
Hazardous Materials Storage	1	469	H	Hazardous materials: spills, leaks, or improper handling or storage
Industry/Industrial Parks	1	469	H	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Jewelry or Metalplating	1	469	H	Solvents, other chemicals, and process wastes: spills, leaks, or improper handling or storage
Machine/Metalworking Shops	4	469	H	Solvents and metal tailings: spills, leaks, or improper handling
Metal and Drum Cleaning/Reconditioning	2	469	H	Residual chemicals in used drums and solvents: spills, leaks, or improper handling or storage
<b>Residential</b>				
Fuel Oil Storage (at residences)	Several		M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Several		M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	8		M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aboveground Storage Tanks	5		M	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	---		L	Microbial contaminants
Fishing			L	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste	3		H	Hazardous materials and waste: spills, leaks, or improper handling or storage
NPDES Locations	1		L	Hazardous material and wastes: improper disposal
Oil or Hazardous Material Sites	4		--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified
Road And Maintenance Depots	1		M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1		M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	3		M	Hazardous materials and waste: spills, leaks, or improper handling or storage

land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 2-12490, 2-10498, 2-10902, 2-13107. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

**6. Autobody shop** — Chemicals such as paints and thinners are used in the nearby auto body shop. Water from the auto repair shop flows into a floor drain located in the shop.

**Recommendations:**

- ✓ The owner of the autobody shop should be made aware of the location of the source of drinking water.
- ✓ Work with the autobody shop to ensure that Best Management Practices are used for the storage, use, and disposal of all paints and solvents.
- ✓ Contact the UIC coordinator for the Central Region Office of the Department

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



for additional technical assistance (Kurt Jacobson Tele. # 508.767.2731).

**7. Septic system**– Septic systems for residential homes lie within the IWPA of the water supply. A neighbor’s septic system and the septic system for the condominium building are located within the IWPA. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

**Recommendations:**

- ✓ The neighbors should be made aware of the location of the source of drinking water.
- ✓ The residents should be instructed to participate with the Town of Leicester in its household hazardous waste collection to discard of spent chemicals.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Other land uses and activities within the Zone II that have include auto repair shops, gas stations, Machine shops, Residential fuel oil storage, Septic

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>YES</b>	The Town "Aquifer Protection District" bylaw meets DEP's best efforts for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

systemsPrinter and Blueprint Shops, Dry Cleaners, Gas Stations, Bodyshops, Service Stations/Autobody Repair Shops, Golf Courses and an Elementary school. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The implementation of land site use questionnaire for builders applying for building permits.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water

#### For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

- supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Snow Dump	1	All	M	Melt water containing de-icing and other chemicals from roads and parking lots: improper handling
Stormwater Drains/ Catch basins	Several	All	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Schools, Colleges, and Universities	1	469	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	3	All	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Snow Dump	1	469	M	Melt water containing de-icing and other chemicals from roads and parking lots: improper handling
Transmission Line Rights-of-Way - Type:	1	406	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	All	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Utility Substation Transformers	1	406	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	9	All	L	Hazardous materials and waste: spills, leaks, or improper handling or storage
Wastewater Treatment Plant/Collection Facility/	1	406	M	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

## APPENDIX B: Regulated Facilities Within The Water Supply Protection Area

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
331745	ATHOL DPW MAINTENCE FACILITY	338 UNITY AVE	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
331745	ATHOL DPW MAINTENCE FACILITY	338 UNITY AVE	ATHOL	Generator of Hazardous Waste	Small Quantity Generator of Hazardous Waste
106146	ATHOL FIRE DEPARTMENT	206 EXCHANGE ST.	ATHOL	Non-Notifier AQ Facility subject to REGS –NOT PERMITTED	Non-Notifier AQ Facility subject to REGS –NOT PERMITTED
125080	ATHOL PRESS INC.	225 EXCHANGE ST.	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
130151	ATHOL TABLE MANUFACTURING CO.	151 HARRISON ST.	ATHOL	Toxic Use Reduction Filer	Large Quantity Toxic User
130151	ATHOL TABLE MANUFACTURING CO.	151 HARRISON ST.	ATHOL	Plant	Air Quality Permit
130151	ATHOL TABLE MANUFACTURING CO.	151 HARRISON ST.	ATHOL	Ground Water Facility	Below Industrial
130151	ATHOL TABLE MANUFACTURING CO.	151 HARRISON ST.	ATHOL	Ground Water Facility	Below Industrial
130151	ATHOL TABLE MANUFACTURING CO.	151 HARRISON ST.	ATHOL	Generator of Hazardous Waste	Small Quantity Generator of Hazardous Waste
344723	ATHOL TEXACO	1590 MAIN ST	ATHOL	Fuel Dispenser	Fuel Dispenser
315461	BAXTER CHIROPRACTIC	123 SOUTH ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
31557	BOSWORTH AUTO REPAIR	375 EXCHANGE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

131686	BUNZL EXTRUSION MASS INC	764 S ATHOL RD	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
131686	BUNZL EXTRUSION MASS INC	764 S ATHOL RD	ATHOL	Industrial Sewer Waste Water	Industrial Waste Water to Sewer
131686	BUNZL EXTRUSION MASS INC	764 S ATHOL RD	ATHOL	Toxic Use Reduction Planner	Large Quantity Toxic Use
131686	BUNZL EXTRUSION MASS INC	764 S ATHOL RD	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
132452	CAMBIUM CORP	339 MAIN ST	ATHOL	Plant	Air Quality Permit
132452	CAMBIUM CORP	339 MAIN ST	ATHOL	Generator of Hazardous Waste	Small Quantity Generator of Hazardous Waste
131313	CLARKS GARAGE	29 CHURCH ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
136283	CUMBERLAND FARMS #2143	297 MAIN ST	ATHOL	Fuel Dispenser	Fuel Dispenser
208881	D & M COUNTRY CONVENIENCE	49 SOUTH MAIN ST	ATHOL	Fuel Dispenser	Fuel Dispenser
36019	DALES AUTO BODY	BICKFORD DR	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
299205	DB AUTO REPAIR	223 MAIN ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
136279	GETTY 30695	223 MAIN ST	ATHOL	Fuel Dispenser FULDSP	Fuel Dispenser FULDSP
330626	GIRARDI DISTRIBUTORS CORP	5 RAILROAD PLACE	ATHOL	Fuel Dispenser	Fuel Dispenser
299430	GMG PRECISION MFG	185 EXCHANGE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
125592	HIGHLAND PRESS	59 MARBLE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
125592	HIGHLAND PRESS	59 MARBLE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator-Waste oil/PCBs ONLY

125592	HIGHLAND PRESS	59 MARBLE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
125592	HIGHLAND PRESS	59 MARBLE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator-Waste oil/PCBs ONLY
130149	LS STARRET COMPANY	121 CRESCENT ST	ATHOL	PLANT	RES Application Approved
130149	LS STARRET COMPANY	121 CRESCENT ST	ATHOL	Industrial Waste Water Surface Water Major	Industrial Waste Water Surface Water Discharge
130149	LS STARRET COMPANY	121 CRESCENT ST	ATHOL	Toxic Use Reduction Filer	Large Quantity Toxic User
223106	MA ELECTRIC CO	20 HARRISON AVE	ATHOL	Generator of Hazardous Waste	Large Quantity Toxic User
223106	MA ELECTRIC CO	20 HARRISON AVE	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
223106	MA ELECTRIC CO	20 HARRISON AVE	ATHOL	Fuel Dispenser	Fuel Dispenser
136288	MR MIKES MOBIL 72	243 MAIN ST	ATHOL	Fuel Dispenser	Fuel Dispenser
125832	NIAGRA CUTLER ATHOL INC	LORD POND PLZ	ATHOL	Generator of Hazardous Waste	Large Quantity Generator of hazardous Waste
222914	ORIGINAL TIRE CO	443 445 S. ATHOL RD	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
222914	ORIGINAL TIRE CO	443 445 S. ATHOL RD	ATHOL	Toxic Use Reduction Filer	Below Toxic Use Reduction Regulated Levels
222914	ORIGINAL TIRE CO	443 445 S. ATHOL RD	ATHOL	Sewer Connection or Groundwater Discharge	Below Industrial
222914	ORIGINAL TIRE CO	443 445 S. ATHOL RD	ATHOL	Plant	Air Quality Permit
37671	PIONEER CLEANERS	293 EXCHANGE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37671	PIONEER CLEANERS	293 EXCHANGE ST	ATHOL	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

182229	SOUTH STREET WELL	TOWN HALL	ATHOL	Surface Water Facility	Surface Water Discharge
130149	STARRETT L S CO THE	121 CRESCENT ST	ATHOL	Generator of Hazardous Waste	Large Quantity Generator

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
ATHOL POST OFFICE	242 MAIN ST	ATHOL	Federal/Non-Municipal	2 Walls	N/A	4000	N/A
D & M CONVENIENCE	49 S MAIN ST	ATHOL	Gas Station	1 Walls	A	5000	Gasoline
CUMBERLAND FARMS #2143	297 MAIN ST	ATHOL	Gas Station	1 Walls	A	8000	Gasoline
ATHOL SATELLITE OFFICE	20 HARRISON AVE	ATHOL	Utilities	2 Walls	I	4000	Gasoline
GETTY PROPERTY #30695	223 MAIN ST	ATHOL	Gas Station	2 Walls	I	10000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
2-0013707	223 MAIN ST	ATHOL	Oil and Hazardous Material
2-0013017	SANDERS ST	ATHOL	Oil
2-0012490	49 SOUTH MAIN ST	ATHOL	Oil
2-0010902	11 EXCHANGE ST	ATHOL	Oil and Hazardous Material
2-0010498	243 MAIN ST	ATHOL	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For BECKET SPRING



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Becket Spring
<i>PWS Address</i>	557 Main Street
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022001

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I (feet)</i>	<i>Zone II</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 Spring	122001-01G	271	Refer to the map	Moderate	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and a Contribution Area or Zone II. The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The Contribution Area is the larger area that is likely to contribute water to the spring. Refer to **Figure 1** on page 2 for an example of a Zone I and Contribution Area.

The Contribution Area of Zone II is the primary recharge area for the aquifer and the spring source. This area was defined by hydrogeologic study conducted for the MA DEP SWAP program by the USGS. The Zone II was approved by DEP. Refer to the attached map to determine the land within your Zone II.

## What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Contribution Area (Zone II). Please see the enclosed map for your well's Zone I and Zone II areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

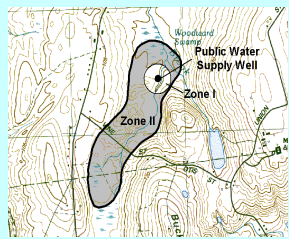
Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source Protection  
Area for Well #1 Spring  
(1022001-01G)**

Zone I = 271 ft.  
Refer to map for the  
Contribution Area

## What is a Protection Area?

A spring's water supply protection area is the land around the spring where protection activities should be focused. Each spring has a Zone I protective area and a contribution area (Zone II).



## How was my Well's Susceptibility Determined?

Your spring's **moderate** susceptibility to potential microbial threats is based on the septic system components within the Zone II contribution area. The **moderate** susceptibility to potential non-microbial threats is based on the local road and residence within the Zone II contribution area.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

## Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
BONNY RIGG INN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 18, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Bonny Rigg Inn
<i>PWS Address</i>	71 Chester Rd
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022004

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1022004-01G	100	414	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

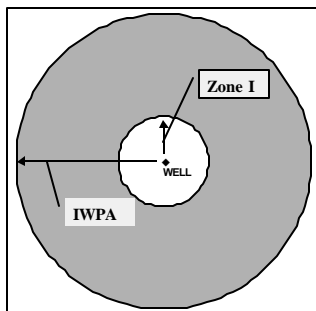
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1022004-01G)**

Zone I = 100 ft.  
IWPA = 414 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the fuel oil storage tanks, local roads and parking within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
CAMP WATITOH



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Camp Watitoh
<i>PWS Address</i>	State Route 8
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1022009-01G	239	587	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

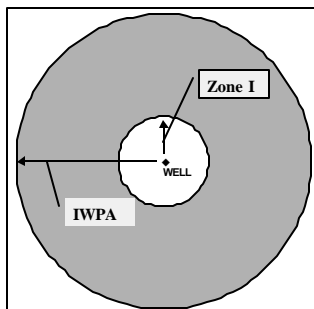
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #  
1 (1022006-01G)**

Zone I = 239 ft.  
IWPA = 587 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components and leachfields within the Zone I and the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and vehicle parking within the Zone I and above ground fuel oil storage within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Reports, water quality data, Sanitary Survey and other sources of information. DEP has not verified the accuracy of the information submitted by you with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Becket/Washington School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 31, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS NAME</b></i>	Becket/Washington School
<i><b>PWS Address</b></i>	Maple Street
<i><b>City/Town</b></i>	Becket, Massachusetts
<i><b>PWS ID Number</b></i>	1022011
<i><b>Local Contact</b></i>	Mr. William S. Enser, Jr.
<i><b>Phone Number</b></i>	(413) 243-1416

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA</b></i>	<i><b>Source Susceptibility</b></i>
Well #2	1022011-02G	158	454	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Becket/Washington School is a small, rural school with a total student and staff population of approximately 245 people per day, located on the corner of Main Street and Maple Road in the town of Becket, Massachusetts. The school is located between Yokum Brook to the west and a steep embankment to the southeast. The school is located just south of the confluence of Yokum Brook and the West Branch of the Westfield River. Becket is a residential, recreational community situated in the Berkshire Hills in eastern Berkshire County. The Town of Becket does not have

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

municipal water or sewer; therefore, the school operates a single public water supply well and disposes of wastewater through an on-site septic system. The school uses propane as a heating fuel and has storage tanks adjacent to the school. Recently, the school underwent an expansion that included the replacement of the original school Well #1 (01G) with Well #2 (02G). There was little information regarding the depth or construction of 01G. That well is believed to have been the original shallow dug well for the site that had been a hotel built in the late 1880s. The well was located beneath the loading dock of the school. The original school was constructed in 1940 with an addition built in 1980 with the most recent addition completed in 2002. The new school Well #2 (02G), is a 6-inch diameter, 395-foot deep bedrock well that is located approximately 125 feet from the addition to the school building. The well casing is finished above grade and is located near the school playground. The Department agreed upon the location of the replacement source after the school was unable to secure land for a well conforming to Zone I requirements. Well #1 is to be abandoned as a water source and decommissioned; that source has been designated as an emergency source and Well #1 will not be discussed further in this report.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. An Interim Wellhead Protection Area (IWPA) is a primary recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA. The Zone I and IWPA protective radii for Well #1 are 158 feet and 454 feet, respectively. The protective radii for the well were based on an approved withdrawal rate determined through a pumping test as part of the New Source Approval Process. As previously noted, the school was recently expanded and the original well replaced. The fuel oil UST was removed (the heating system was converted to propane) and the septic system was upgraded; the leachfield is located across the street, outside of the protection areas.

Geologic mapping and field observations indicate the school is located in the Berkshire uplands with thin till overburden covering the bedrock. Sand and gravel deposits are mapped just north of the school in the Westfield River valley, but drilling logs and observations of bedrock outcrops confirm thin overburden at the site. Drilling indicated a relatively thin layer (13 feet) of sandy loam, most likely alluvium over fractured bedrock. Sound bedrock was encountered at approximately 25 feet below grade. The bedrock structure is mapped as a complex series of folds and faults

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system/facility.
Septic system components	Yes	Yes	Moderate	Maintain septic systems.
Transportation corridors and school parking	No	Yes	Moderate	Control the use of deicers and coordinate with emergency response personnel. Monitor for leaks and spills near the well.
School	Yes	Yes	Moderate	Use BMPs for school facilities.
Residential	No	Yes	Moderate	Provide information on BMPs.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

with bedrock mapped as various metamorphic rocks of the Taconic-Berkshire Zone. The bedrock in the immediate vicinity of the school is mapped as Tyringham Gneiss. There is no evidence of a continuous confining, clay layer or a thick till layer in the immediate vicinity of the well. Wells located in these conditions are considered to be located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from activities on the ground surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is not treated prior to distribution. The DEP requires public water suppliers to regularly monitor the quality of the water. For current information on monitoring results and treatment, please refer questions to the Public Water System contact person listed above in Table 1 for the most recent information. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the EPA's website for Envirofacts.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

## 2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **School/Institutional facilities;**
3. **Residential; and**
4. **Transportation corridor/parking.**

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA of the well, as seen in Table 2.

**1. Non-conforming Zone I** – Well #1 has a non-conforming Zone I with respect to ownership and activities within the Zone I. There is a play structure within the Zone I of Well #1 however, the DEP may allow some passive recreation and other non-threatening activities within the Zone I. The DEP approved this replacement source with a non-conforming Zone I as part of the school upgrade and improvement to replace a more vulnerable shallow well. There are also non-conforming activities in the Zone I, such as part of a tennis court and the school.

### Recommendations:

- ✓ Continue to work toward prohibiting/limiting activities in close proximity to the well and using BMPs to protect the water supplies.
- ✓ Do not allow any additional non-conforming activities within Zone I. Inspect the well cap regularly to ensure the security of the cap and that there is no standing water at the well.
- ✓ Monitor the runoff from the parking area and roadways to ensure there is no runoff directed toward the well.
- ✓ If Well #1 has not been decommissioned yet, contact the Springfield Regional office of the DEP for assistance.

**2. School/Residential and Institutional use**– The school facilities, several residential properties, a church and the library are within the Zone I or IWPA of the well. Elementary schools and these institutional facilities generally use only household hazardous materials and the recommendations for small schools are similar to those for residents. There are state and federal controls on some activities and products used at schools to promote “healthy schools”. Potential exists for contamination of the well by onsite use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. Storm drains in the parking areas or the roads and residences drain directly into the ground or to the brook. If managed



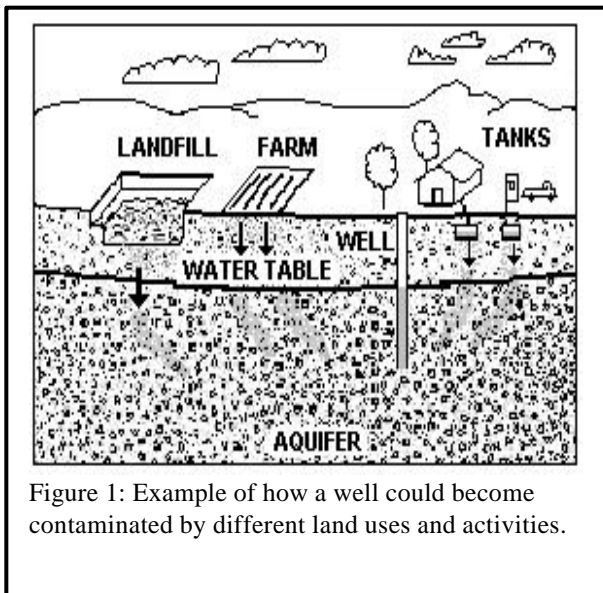


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

improperly, activities associated with residences and the school can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, petroleum products for home equipment and lawn maintenance equipment and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at the following MADEP website <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### School/Institutional and Residential Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and online at [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), the MA DEP website which provides BMPs for common residential issues.
- ✓ Continue the use and maintenance of BMPs for activities within close proximity to the well.
- ✓ Continue to prohibit the use of pesticides or fertilizers within the Zone I of the well. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers.
- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.

- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Association's Healthy Schools website at the following website [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information
- ✓ Prepare a policy and a plan for maintenance operation regarding the boiler. DEP recommends that you require your boiler maintenance contractor to use containment and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should also be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**6. Transportation corridor and parking** – The parking areas for the school as well as Main Street and Maple Street are within the IWPA of the well. Most of these activities are topographically downgradient of the well. Accidents and normal

use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The School is commended for utilizing propane as a fuel source and working to provide a more protective source at the school. The DEP encourages continued diligence in monitoring activities within and near protection areas. The water supplier should review and adopt the key recommendations above.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Pittsfield at 413-443-6867 ext. 3 or assistance. This may be appropriate for the local Highway Department.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
YMCA CAMP BECKET



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	YMCA Camp Becket
<i>PWS Address</i>	48 Hamilton Rd
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022019

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 Infirmary Well	1022019-01G	190	489	High	Moderate
Well #2 Kitchen Well	1022019-02G	235	578	High	High

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

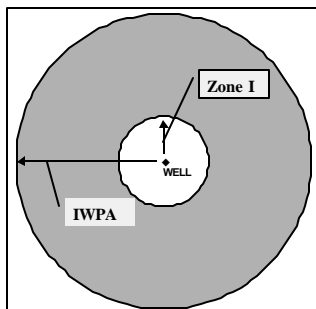
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
Infirmary Well (1022019-  
01G)**

Zone I = 190 ft.  
IWPA = 489 ft.



## How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone Is / IWPA's. The **high** susceptibility to potential non-microbial threats for Well #2 is based on the local roads, parking, and maintenance garage within the Zone I and/or the IWPA. The **moderate** susceptibility to potential non-microbial threats for Well #1 is based on the absence of local roads, parking, or other threats within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 2000 Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report For Kushi Institute

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 4, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Kushi Institute</b>
<b>PWS Address</b>	<b>308 Leland Rd.</b>
<b>City/Town</b>	<b>Becket, Massachusetts</b>
<b>PWS ID Number</b>	<b>1022027</b>
<b>Local Contact</b>	<b>Mariana Pina-Bergtold</b>
<b>Phone Number</b>	<b>413-623-5741</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
West Well	01G	165	460	High
East Well	02G	135	438	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

## 1. Description of the Water System

The 2 wells for the facility are located near the driveway, northeast of the dormitory. West well has a Zone I of 165 feet and an Interim Wellhead Protection Area (IWPA) of 460 feet. East well has a Zone I of 135 feet and an IWPA of 438 feet. The two wells are within close proximity to one another, approximately 35 feet apart. The public water system for the facility also includes the Mountain Spring 1022027-03G, an emergency source that is currently disconnected from the system and not included in this report. The IWPAs provide an interim protection area for water supply wells when the actual recharge areas have not been delineated. The actual recharge areas to the wells may be significantly larger or smaller than the IWPAs.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

USGS mapping shows the area as till over bedrock, with the structural geology mapped as complex folds and faults of gneissic formations. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs. The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

At the time this report was prepared, the well water for Kushi Institute does not require and does not have treatment. The DEP requires public water suppliers to monitor the quality of the water. For current monitoring results, please refer questions to the local contact identified in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming Activities in Zone Is;**
2. **Confirmed Hazardous Materials/Oil Release Sites;**
3. **Aboveground Storage Tanks (ASTs) With Heating Oil;**
4. **Floor drains in boiler rooms;**
5. **Septic system in IWPA; and**
6. **Improper storage of household hazardous materials.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of many moderate threat land uses or activities in the IWPA, as seen in Table 2.

**1. Zone Is** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The West and East wells' Zone I contain a 22-room dormitory, driveways and waste transfer stations (dumpsters). Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Kushi reportedly has relocated the dumpsters further away from the wells.

#### Recommendations:

- ✓ Since Kushi Institute owns much of the land in the surrounding area. Consider installing a well in a location away from the facility.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage - Above Ground	No	Both wells	High	Oil tanks should be at 110% containment
Waste Transfer Stations	Both wells	Both wells	Moderate	Relocate dumpsters outside of the Zone I
Confirmed hazardous materials/oil release sites (2) - (tank overfills)	No	Both wells	**	RTN 1-0012103 and 1-0012229, Tier 1B; See Appendix A
Floor Drains in boiler room	Both wells	Both wells	Moderate	Bring the floor drains into compliance with Department Regulations
Septic System	Both wells	Both wells	Moderate	See septic systems brochure in the appendix
Storage of household hazardous materials	No	Both wells	Moderate	Provide secondary containment; do not store in area of basement with dirt floor
Parking lot, driveways & private access roads	No	Both wells	Moderate	Limit road salt usage and provide drainage away from wells

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/). \*\* - See Appendix A.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Do not use or store pesticides, fertilizers, petroleum products (including equipment that use petroleum) or road salt within the Zone I.

**2. Confirmed Oil Release Site** - The IWPA's of both wells contain DEP Bureau of Waste Site Cleanup Tier 1B Classified Oil and/or Hazardous Material Release sites indicated on the map as Release Tracking Numbers 1-0012103 and 1-0012229. The releases of oil were discovered after the filling of ASTs in November 1997 and March 1998 respectively. Contaminated soil was removed from both sites. For further information on the status of both of these spills, please contact the DEP-Bureau of Waste Site Cleanup at 413-784-1100. For information regarding the location of the site refer to the attached map. Appendix A includes additional information regarding the Massachusetts Contingency Plan (MCP) and where additional information is available.

### Recommendation:

- ✓ Comply with the requirements of the MCP process and continue monitoring as prescribed by DEP.

**3. Aboveground Storage Tank (AST)** – There are three ASTs located within the IWPA's containing heating oil. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store. None of the tanks have containment.

### Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface and contained in an area large enough to hold 110% of the liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs. Diligently monitor the delivery of oil.

**4. Floor Drain in boiler room** - Floor drains in an area that contains hazardous materials must be sealed or discharged to a tight tank or a sewer. It is not known whether the floor drain in the boiler room discharges to a dry well or the septic system. The floor drain must therefore either be sealed or connected to a tight tank since there is no sanitary sewer available.

### Recommendations:

- 3 Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - \* Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
  - \* Interim Actions: cease using the floor drains.
- ✓ Install a containment structure around the ASTs to contain 110% of the tank volume near the boiler to protect from any potential oil leaks caused by overfill or tank failure.

**5. Septic System in IWPA's** – Within the IWPA's of both wells are three leach fields; two are in use and one is disconnected from the system. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

### Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

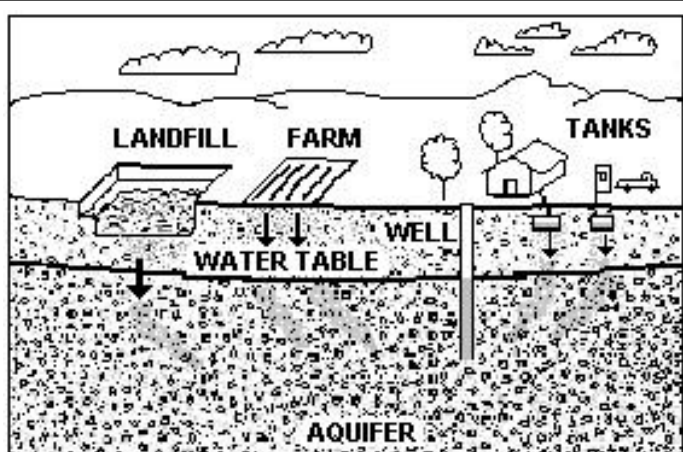


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**6. Improper storage of hazardous household materials** – Paint, wood stains and varnishes, and used oil were found stored on open shelves in small basement room with a gravel and dirt floor.

#### Recommendations:

- ✓ Store in area with a sealed floor and within stable, enclosed cabinets.
- ✓ Provide secondary containment for storage of potentially hazardous items.

Other issues noted during the site visit were lawn maintenance equipment and gasoline being stored within the Zone I behind the dormitory. These should be contained and removed from the Zone I.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Kushi Institute should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Seal the floor drains in the boiler rooms or provide a tight tank. (See attachment)
- ✓ Provide proper storage and containment for ASTs and hazardous materials.

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Protect the well by using secure well caps and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider upgrading to propane gas for an alternate fuel or back-up power source.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations such as parking areas.

#### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf>.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in

areas using hazardous materials, discharge drains to a tight tank or seal floor drains.

- ✓ Remove hazardous materials from rooms or store them in a contained area.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete or earthen collars around wellheads should slope away from well and the well casing should extend above ground.

#### Planning:

- ✓ Work with local officials in Becket to include the IWPA's of Kushi Institute in Aquifer Protection District Bylaws.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Source Protection Sign Order Form

#### **5. Appendix**

- Table of DEP Regulated Chapter 21E Hazardous Materials Release Sites

Y:/SWPQRT/WERO/10220127 Kushi

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
LANE FARM ROAD



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 13, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Lane Farm Road
<i>PWS Address</i>	Lane Farm Road
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022029

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Lane Farm Road Well	1022029-01G	100	408	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

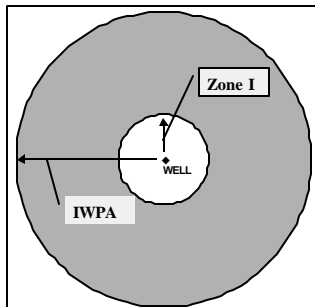
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for LANE  
FARM ROAD WELL  
(1022029-01G)**

Zone I = 100 ft.  
IWPA = 408 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on buildings and access road and parking within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
BECKET TOWN HALL



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Becket Town Hall
<i>PWS Address</i>	557 Main St
<i>City/Town</i>	Becket, Massachusetts
<i>PWS ID Number</i>	1022030

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1022030-01G	100	409	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

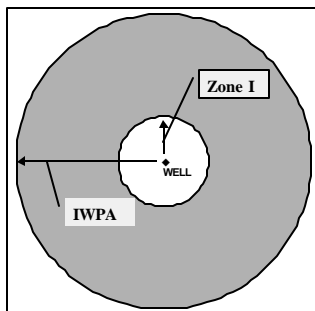
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1022030-01G)**

Zone I = 100 ft.  
IWPA = 409 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the underground fuel oil storage tank in the IWPA. Moderate threats are parking and local roads within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Belchertown Water District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Belchertown Water District
<i><b>PWS Address</b></i>	206 Jabish St., PO Box 801
<i><b>City/Town</b></i>	Belchertown
<i><b>PWS ID Number</b></i>	1024000
<i><b>Local Contact</b></i>	Mr. Timothy Lofland
<i><b>Phone Number</b></i>	413-323-6987

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

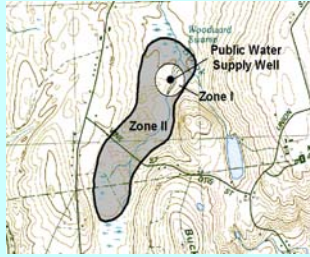
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Groundwater Sources

#### *Zone II #: 208*

*Susceptibility: High*

<i>Well Name</i>	<i>Source ID</i>
Daigle Well	1024000-05G

#### *Zone II #: 112*

*Susceptibility: High*

<i>Source Name:</i>	<i>Source ID</i>
Jabish Brook Well #1	1024000-01G
Jabish Brook Well #2	1024000-02G
Jabish Brook Well #3	1024000-03G
Jabish Brook Well #4	1024000-04G

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Belchertown Water District supply consists of by five groundwater sources: Jabish Brook wells #1, 2, 3, and 4 (1024000-01G, 02G, 03G, and 04G), and Daigle well (1024000-05G). Each well has a Zone I radius of 400 feet. The Jabish Brook wells are located off Johnson Road, east of the center of town. These wells are equipped with submersible pumps and are manifolded together to produce a cumulative yield of 324,000 gallons per day (gpd) with a pumping capacity of 355 gallons per minute (gpm). Well #1 is 16 x 24-inch gravel-packed, 38 foot deep well. Wells 2, 3, and 4 are all 8 x 12-inch gravel packed wells, with depths of 40, 39, and 38 feet respectively. The Daigle well is located off of Federal Street in the northwest section of town. It is a 12 x 18-inch, gravel-packed well with a well screen set to 89 feet to 104 feet below grade, and has an approved yield of 1.3 millions of gallons per day (mgd). The Jabish Brook Wellfield (1024000-06G) is an emergency source and is not addressed in this report, however 06G is proximal to wells 1, 2, 3 and 4.

The Daigle well utilizes water from a confined sand and gravel aquifer, upgradient and in the same formation as the Amherst water supply wells. The bedrock valley was deepened by advancing glaciers and later filled with sand and gravel overlain by silt and clay from glacial Lake Hitchcock and Lake Lawrence some 18,000 years before present. The confining clay layer is primarily contiguous through the center of the buried valley with the clay layer pinching out toward the edges of the aquifer allowing significant recharge along the basin boundaries. The Zone II for this well includes the perimeter of the basin where the silt and clay units are discontinuous and inter-fingered with sand and gravel deposits resulting in a semi-confined recharge area. The Zone II was delineated as required under the Department's New Source Approval Process and was based on conceptual, numerical and analytical modeling of the aquifer. Please refer to the attached map to view the boundaries of the Zone II.

The Jabish Brook wells utilize a different aquifer, and have a different Zone II. These wells are located in a complex depositional environment of outwash deposits and ice-channel sediments exhibiting distinct layers of sand and gravel. This aquifer is semi-confined, with only a partial confining layer of clay or silt.

Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The District is conducting a pilot study on corrosion control using sodium carbonate on the water pumped from the Daigle and Jabish Brook wells. The chemical is injected directly into the discharge line to the distribution system. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

### For More Information

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

## Section 2: Land Uses in the Protection Areas

The Zone IIs for Belchertown's wells is a mixture of residential, agricultural,

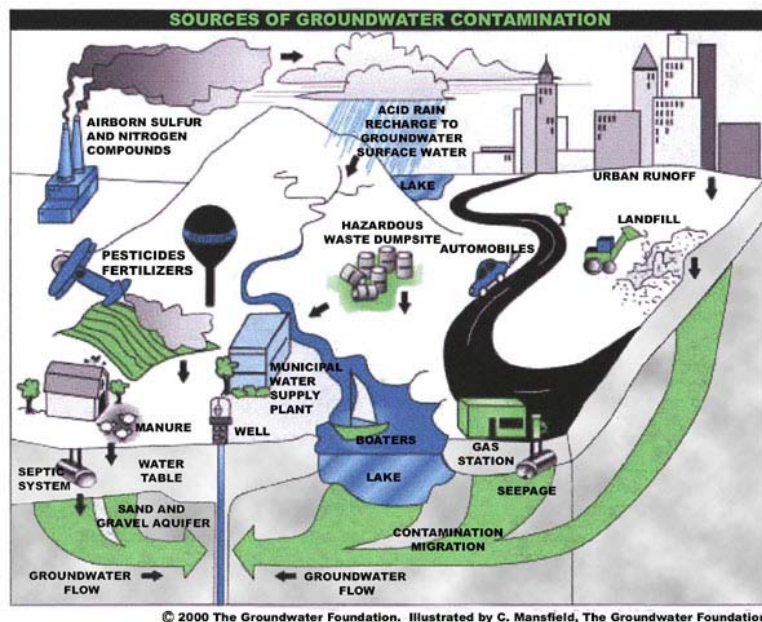
and some light commercial and industrial areas (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Residential land uses
2. Transportation corridors
3. Hazardous materials storage and use
4. Comprehensive wellhead protection planning
5. Agricultural activities

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 14% of the Zone II #208 consists of residential areas, and about 38% in the Zone II #112. From this perspective, residential land uses are more of a potential threat within the Zone II #112 than in #208. None of the areas have public sewers; all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:



- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and



AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Continue catch basin cleaning routines.

**2. Transportation Corridors** - Route 9 and local roads are common throughout the both of the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency

response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**3. Hazardous Materials Storage and Use** – A very small percentage (<1%) of the land area within the Zone II #208 is commercial or industrial land uses, about 2% in the Zone II #112. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal

### Source Protection Decreases Risk

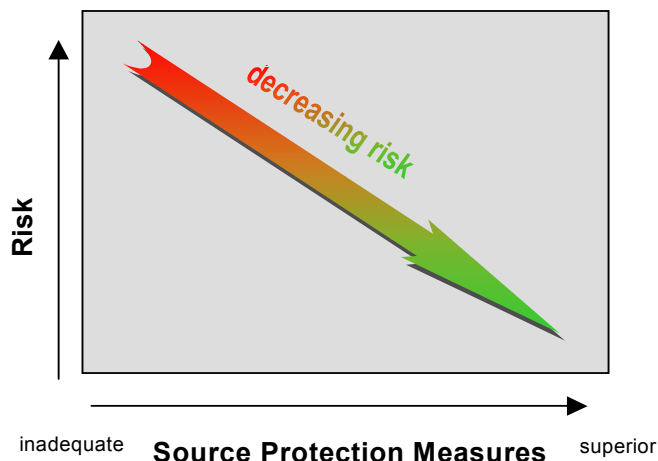


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II Effected	Potential Contaminant Sources*
<b>Agricultural</b>				
Dairy Farms	1	Moderate	208	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	Numerous	Moderate	208	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	4	Moderate	208	Manure (microbial contaminants): improper handling [2 horse farms, 1 emu farm, 1 rabbit farm]
Nurseries	1	Moderate	208	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application [1 Greenhouse]
Pesticide Storage or Use	Numerous	High	208	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Gas Stations	1	High	208	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	2	High	208 & 112	Automotive fluids and solvents: spills, leaks, or improper handling
Railroad Tracks	1	High	208	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	1	Moderate	208	Heavy equipment, fuel storage, clandestine dumping: spills or leaks (another operation very near but outside of Zone II #112)
<b>Industrial</b>				
Fuel Oil Distributors	1	High	208	Fuel oil: spills, leaks, or improper handling or storage
Hazardous Materials Storage and Waste Storage	Numerous	High	208	Hazardous materials: spills, leaks, or improper handling or storage
<b>Miscellaneous</b>				
Aboveground Storage Tanks	Numerous	Moderate	208 112	Materials stored in tanks: spills, leaks, or improper handling
Composting Facilities	1	Low	208	Organic material, animal waste, and runoff: storage and improper handling
Small quantity hazardous waste generators	2	Moderate	208 112	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	Low	208	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	Moderate	208	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	2	High	208 112	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	5	Low	208 112	Hazardous materials and waste: spills, leaks, or improper handling or storage



Land Uses	Quantity	Threat	Locale	Potential Contaminant Sources*
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	Moderate	208	Fuel oil: spills, leaks, or improper handling (Most USTs have been removed)
Lawn Care / Gardening	Numerous	Moderate	208	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	Moderate	208	Hazardous chemicals: microbial contaminants, and improper disposal

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**Potential Source of Contamination vs. Actual Contamination**

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**4. Protection Planning** – Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells. Amherst has approximately 90% of the Wellhead Protection Planning Components in place; the plan needs to be formalized and submitted to the Department, and public education and outreach needs to be strengthened and continued.

### Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to review local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). There are no local controls for the Lawrence Swamp aquifer. Adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**5. Agricultural Activities** – There are several farms on the western edge of the Zone II. Crop and pasture lands make up about 16% of the land use in Zone II #208, 4% in the Zone II #112. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

### Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

Other land uses and activities within the Zone IIs that have potential for contamination include auto repair shops, gas stations, large equipment storage, and a greenhouse. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply.

### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



## Section 3: Source Water Protection Conclusions and Recommendations

### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Implementation of protective bylaws for the Jabish Brook watershed. We encourage Belchertown to expand the protection district to the Lawrence Swamp aquifer and adopt floor drain regulations throughout the Town.

### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with the planning board to propose protective bylaws for the Lawrence Swamp aquifer area.
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.

- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Conduct a survey of all USTs in the Zone IIs and encourage or fund as feasible the removal of those threats.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement Wellhead Protection Plans.

#### **Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

Land uses within the Zone III are not assessed for SWAP reports unless the source is under the direct influence of groundwater.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

#### **Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Investigate purchasing the Zone I land.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>NO</b>	The Town "Aquifer Protection District" has bylaws for well-head protection in Jabish Brook. There is no protection for the Daigle Well. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>YES</b>	Amherst has wellhead controls, however, Belchertown does not for the Daigle Well.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>NO</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim education at schools and commercial, industrial and municipal uses within the Zone II.



# Source Water Assessment Program (SWAP) Report for Sports Haven Mobile Home Park

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 11, 2002

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	<b>Sports Haven Mobile Home Park</b>
<i>PWS Address</i>	<b>Mill Valley Road, State Route 21</b>
<i>City/Town</i>	<b>Belchertown, Massachusetts</b>
<i>PWS ID Number</i>	<b>1024001</b>
<i>Local Contact</i>	<b>Ms. Trudy Drosehn</b>
<i>Phone Number</i>	<b>413-323-7206</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1024001-01G	341	1296	High
Well 2	1024001-02G	341	1296	High

## INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

The Sports Haven Mobile Home Park is a year round, residential mobile home park with a population of approximately 150 people. The 52.9-acre facility has 54 closely located mobile homes, all utilizing on-site septic systems. Some units have individual septic systems while some share a system between two units. The facility has one active supply well, new dug well 02G. Very little information is available regarding the structure and functioning of the old dug well, 01G. A 6 x 6 foot vault is partially filled with water approximately 25 feet from the edge of the pond. There are no records for this source and there is no connection to the distribution system from that vault. However, active distribution pipes pass through the vault. The new dug well 02G was constructed in 1974, replacing the old well and is a 3-foot diameter by 16-foot deep, tile, dug well. The Zone I protective radii for Well 01G and 02G is 341 feet. The Interim Wellhead Protection Area (IWPA) radii for 01 and 02G is 1,296 feet. The protective



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

radii were based on the pump capacity rate of 28 gallons per minute, as measured during site visits. Although the pump reportedly runs continuously, 24-hours per day, the metered usage for the two highest months on record for well 02G is in excess of the pumping capacity rate. A new meter was installed in September 2000 and the facility manager is attempting to address leaks and uncontrolled water use at the facility. However, until consistent reduction in water usage is documented and verified, the conservative water usage is based on the capacity rate of the pump. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller. Please refer to the attached map that shows the Zone I and IWPA radii.

The wells are shallow surficial sand and gravel wells located within a stratified drift deposit mapped as a moderate yield aquifer; there is no fine-grained confining unit, such as clay, mapped in this area. The bedrock is mapped as the Belchertown Complex, an intrusive quartz monzodiorite. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The shallow nature of the dug well provides minimum natural filtration.

The Sports Haven Mobile Home Park well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

A number of land uses and activities within the drinking water supply protection areas are potential sources of contamination. Therefore, the overall ranking of susceptibility to contamination for the wells is high, based on the number and proximity of land uses and activities in the Zone I and IWPA, as seen in Tables 2 and 3.

### Key Land Use Issues for the Wells include:

1. **Non-conforming activities in the Zone Is**
2. **Septic Systems within Zone I**
3. **Above Ground Storage Tanks (ASTs)**

**Table 2: Table of Activities Common to the Protection Areas**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Trailers, lawns and residential parking	Both Wells	Both Wells	Moderate	Household hazardous materials, pesticides and herbicides
All components of septic systems	Both Wells	Both Wells	Moderate	Conventional and cesspools
Parking lots and driveways	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Internal transportation corridor	Both Wells	Both Wells	Moderate	Road salt, spills and runoff
Aboveground Storage Tanks (AST, home heating kerosene)	Both Wells	Both Wells	Moderate	Kerosene

\*- For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



**1. Non-conforming activities in the Zone Is** – The Zone Is for wells 01G and 02G are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone I for Well 02G contains 16 homes and related facilities including septic disposal. (One trailer was removed and one of the 16 trailers has been destroyed by fire but remains on-site). In addition, off of the facility property, there is a vault that may be an old well within the Zone I of 02G. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I. Normal residential activities generally pose minimal threat to the water quality of the public water supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and septic systems and they utilize best management practices. Due to the close proximity of the residents to the shallow well, the potential threat is significant if not properly managed.

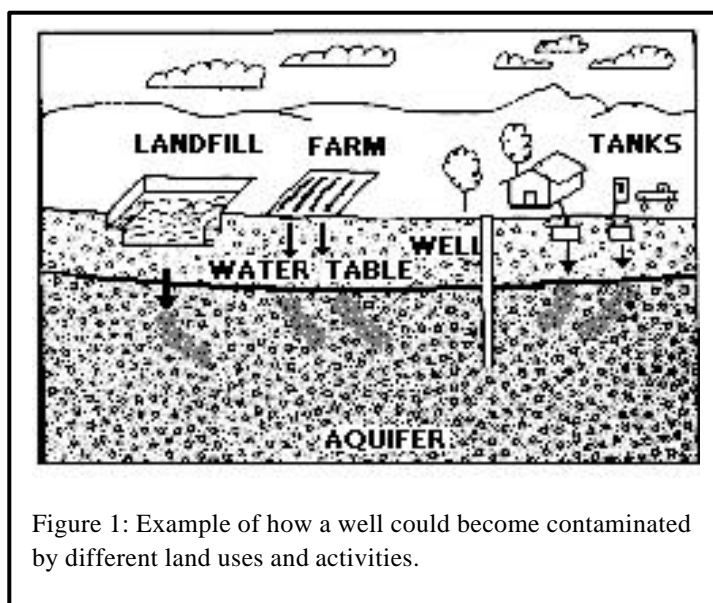


Figure 1: Example of how a well could become contaminated by different land uses and activities.

The metered water use for the system is, at times, significantly higher than the anticipated usage for a facility of this size. This excess use may be due to unchecked, excessive water use by tenants or leakage. Excessive water use expands the area of contribution to the well, increasing the potential impact from activities in the area.

**Recommendations:**

- ✓ Investigate the viability of the Old Dug well 01G. Abandon and decommission that well, as you have proposed.
- ✓ Continue your on-going efforts in leak detection and repair.
- ✓ Establish a policy for the use of low flow plumbing units and conservation measures and remind tenants to conserve water.
- ✓ Relocate well to mitigate threat to the water supply.
- ✓ Ensure that any old connection to the system are severed, such as to the old farm house.
- ✓ Monitor existing activities within Zone I. Do not conduct any additional activities within the Zone I.
- ✓ Provide information to residents about the potential hazards and liability of household chemicals, lawn care chemicals and fertilizers. Include information on Best Management Practices (BMPs) for the use of those items and proper septic system maintenance and disposal practices.
- ✓ Prepare a wellhead protection and emergency response plan.
- ✓ Contact MA DEP prior to conducting any new activities within Zone I.
- ✓ Contact the property owner to gain access to the property to investigate the open vault. If there is a potential open conduit, such as an abandoned well, request that the owner decommission the unit and fill in the vault.

**2. Septic system components** – Eight shared septic systems, four individual systems and one cesspool, are located within the Zone I of 02G. An equivalent number of systems are within the Zone I of 01G. Improper disposals of household hazardous waste through septic systems as well as, close proximity of the systems to the shallow well, pose a significant potential threat to water quality.

**Recommendations:**

- ✓ Refer to recommendations under Item 1.
- ✓ Continue the current practice of routine maintenance and replacement as appropriate, of the systems.

**3. Aboveground Storage Tanks** – All of the homes have aboveground kerosene and/or propane storage tanks. The facility does not have a tank replacement or maintenance policy.

**Recommendations:**

- ✓ Establish a policy for replacement of aging tanks (consider 10-15 years); require containment, at a minimum a concrete pad and maintenance, such as painting, for all new tanks. Require at a minimum, routine inspection and painting of existing tanks.
- ✓ Monitor for leaks and spills periodically, especially during delivery.

Work with the DEP and local officials regarding protecting the water supplies through emergency response coordination.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

## 3. PROTECTION RECOMMENDATIONS

To reduce the system's susceptibility to contamination, the Sports Haven Mobile Home Park should review and adopt the following recommendations:

### Priority Recommendations:

- ✓ Reduce water usage through leak repair, conservation measures and informing tenants of the necessity to conserve water.
- ✓ Abandon and decommission well 01G and consider replacing well 02G.

### Zone I and IWPA:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs. Check the integrity of the well caps regularly and replace as necessary.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any aboveground tanks for leaks, etc.
- ✓ Investigate alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Work with the DEP and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents.

### Facilities Management:

- ✓ Encourage residents to utilize the Town's household hazardous waste collection days. To learn more, see the hazardous materials guidance manual at <http://www.state.ma.us/dep/consumer/consumer.htm>
- ✓ Establish policies regarding vehicle maintenance, lawn care and oil/hazardous material storage tanks, especially in Zone I.
- ✓ Repair leaks as soon as practical. Continue the current practice of on-going leak detection and repair. Establish water use restrictions as necessary to control excess water usage.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. Especially the transformers in Zone I. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Belchertown to include the facility IWPA in the Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment will be provided to the public water supplier, town boards, and the local media.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. ATTACHMENTS**

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Developing a Local Wellhead Protection Plan
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet
- Septic system brochure
- Household Hazardous Waste information



# Source Water Assessment Program (SWAP) Report for Pine Valley Plantation

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 24, 2001

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	<b>Pine Valley Plantation</b>
<i>PWS Address</i>	<b>281 Chauncey Walker Street, State Route 21</b>
<i>City/Town</i>	<b>Belchertown, Massachusetts</b>
<i>PWS ID Number</i>	<b>1024002</b>
<i>Local Contact</i>	<b>Mr. Paul Cook</b>
<i>Phone Number</i>	<b>413-323-7206</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1024002-01G	300	880	Moderate
Well 2	1024002-02G	280	754	Moderate
Well 3	1024002-03G	303	904	Moderate
Well 4	1024002-04G	225	552	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Pine Valley Plantation is a retirement community, mobile home park. The park is a 150-acre facility, currently with 385 prefabricated homes and a total population of approximately 770 residents and staff. The facility has recently connected all of the homes to the Town sewer system. The facility has four supply wells that are all located within relatively close proximity to each other in the northeast section of the property. The Zone I protective radii for Wells 1 through 4 are as follows: Well #1 (01G), 300 feet; Well #2 (02G), 280 feet; Well #3, 303 feet; Well #4, 225 feet. The Interim Wellhead Protection Area (IWPA) radii for wells 1 through 4 are: Well #1 (01G), 880 feet; Well #2 (02G), 754 feet; Well #3, 904 feet; Well #4, 552 feet. The protective radii

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

were based on metered usage for the two highest months on record for each well. Please refer to the attached map that shows the Zone I and IWPA radii. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller.

Wells #1 through #4 are all 8-inch diameter wells drilled into the bedrock aquifer. Wells #1 and #2 were drilled in 1971 while wells #3 and #4 were drilled in 1977. Well #1 is located approximately 100 feet northwest of the motor control building and drilled to a depth of 140 feet below grade. Well #2 is located 85 feet west of the building and drilled to a depth of 225 feet. Well #3 is located approximately 200 feet southeast of the building and is drilled to a depth of 440 feet with 57 feet of casing set into bedrock. Well #4 is located 75 feet southwest of the building and drilled to a depth of 120 feet with 47 feet of casing set into bedrock.

The wells are located within a stratified drift deposit mapped as a moderate to high yield surficial aquifer and there is no fine-grained confining unit, such as clay, mapped in this area. The bedrock is mapped as the Belchertown Complex, an intrusive quartz monzodiorite. There are no detailed records of the well construction or of the materials encountered during drilling. However, the length of casing in wells #3 and #4 indicates that the overburden is approximately 30 to 40 feet of sand and gravel. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Pine Valley Plantation Cooperative Corporation (PVPCC) well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

A number of land uses and activities within the drinking water supply protection areas are potential sources of contamination. Therefore, the overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of moderate threat land use or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

### Key Land Use Issues for the Wells include:

1. **Non-conforming activities in the Zone Is**
2. **Solid waste transfer station (facility only)**
3. **Aboveground storage tanks - ASTs**

**Table 2: Table of Activities Common to the Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Dumpster, recycle station, other storage	Well 1	All Well	Moderate	Accidents and illegally disposed of hazardous materials pose a potential threat
Parking lots and driveways	No	All Wells	Moderate	Limit road salt usage and provide drainage away from wells
Internal transportation corridor	No	All Wells	Moderate	Road salt, spills and runoff
Sewage pipelines/pump station	No	All Wells	Moderate	Gravity and pressure mains
ASTs (home heating kerosene)	Well 1	All Wells	Moderate	Kerosene

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



**Table 2: Table of Activities Common to the Protection Areas (Continued)**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Trailers, lawns and residential parking	Well 1	All Wells	Moderate	Household hazardous materials, pesticides and herbicides
Storm drains	No	All Wells	Low	Road salt, spills and runoff

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**1. Non-conforming activities in the Zone Is** – The Zone I for Well #1 is nonconforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone I for Well 1 contains a trailer and the facility solid waste transfer station, trash dumpster. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendation:**

- ✓ Do not conduct any additional activities within the Zone I and continue your commendable and diligent monitoring of activities within Zone I, use of BMPs and training for emergency response. Contact MA DEP prior to conducting any activities within Zone I.

**2. Facility Transfer station and storage** - The solid waste transfer station and facility storage is within the Zone I of Well #1. Improper disposal of household hazardous waste in the trash poses a potential threat if a release from the dumpster occurs.

**Recommendations:**

- ✓ Relocate the dumpster and storage facilities outside of the Zone I. If it is not possible to relocate the dumpster, protect the area with containment such as a concrete pad and monitor the waste stream.
- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Conduct household hazardous waste collection.

**3. Aboveground Storage Tanks** – All of the homes have aboveground kerosene storage tanks. The facility has a policy requiring all tanks 15 years of age or older to be replaced or have secondary containment. All tanks must be painted.

**Recommendations:**

- ✓ Continue the current policy and monitor for leaks and spills during delivery.

Other activities noted within the protection areas of the wells are residential development including the PVPCC and an abutting residential neighborhood. Normal residential activities pose minimal threat to the water quality of the public water supply as well as their own private supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and septic systems and they utilize best management practices. Provide information to residents about the potential hazards of household chemicals, lawn care chemicals and fertilizers. Include information on Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides, household hazardous waste and septic system maintenance and disposal practices.

Stormwater discharge is located within the Zone I and IWPA of the wells. The PVPCC should use BMPs and include periodic cleaning of catch basins and street sweeping. Street sweepings and catch basin cleanings are considered solid waste and should be handled as described in the DEP's policy. Coordinate with the Town to manage these wastes. Work with the DEP, State highway and local officials regarding protecting the water supplies through emergency response coordination, especially with respect to spills and accidental releases that may be discharged through storm drains.

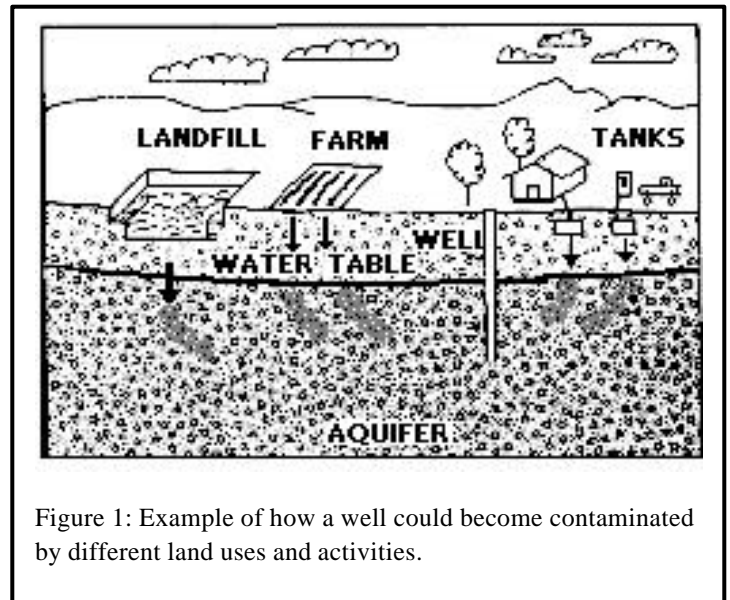


Figure 1: Example of how a well could become contaminated by different land uses and activities.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

## 3. Protection Recommendations

To reduce the system's susceptibility to contamination, the Pine Valley Plantation Cooperative Corporation should review and adopt the following recommendations:

### Priority Recommendation:

- ✓ Relocate the dumpster and storage facilities outside of the Zone I. If it is not possible to relocate the dumpster, protect the area with containment such as a concrete pad and monitor the waste stream.

### Zone I and IWPA:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs. Check the integrity of the well caps regularly and replace as necessary.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any aboveground tanks for leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Work with the DEP, State highway and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents.

### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, certified operator, and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Monitor all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. Especially the transformers in Zone I. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in the Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment will be provided to the public water supplier, town boards, and the local media.

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Developing a Local Wellhead Protection Plan
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet

W:/brp/ws/wsd/doc/swap doc/1024002

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
MILL VALLEY GOLF LINKS



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 18, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Mill Valley Golf Links
<i>PWS Address</i>	380 Mill Valley Rd
<i>City/Town</i>	Belchertown, Massachusetts
<i>PWS ID Number</i>	1024006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1024006-01G	100	406	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

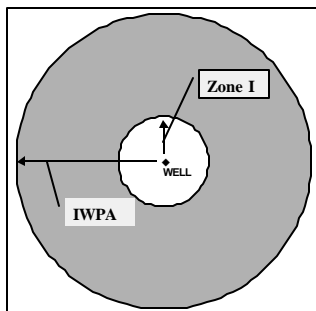
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1024006-01G)**

Zone I = 100 ft.  
IWPA = 406 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I. The **high** susceptibility to potential non-microbial threats is based on the hazardous materials storage, UST and local roads within the Zone I and IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection

## Source Water Assessment Program (SWAP) Report

### for Cedarwood Apartments

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 22, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Cedarwood Apartments</b>
<b>PWS Address</b>	<b>154 Amherst Road</b>
<b>City/Town</b>	<b>Belchertown, Massachusetts</b>
<b>PWS ID Number</b>	<b>1024009</b>
<b>Local Contact</b>	<b>Mr. George Adams</b>
<b>Phone Number</b>	<b>508-385-4430</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1024009-01G	164	459	Moderate

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

Cedarwood Apartments is a small rural, residential apartment complex that serves 12 homes in southeastern section of Belchertown with a community of approximately 30 people. Although municipal water and sewer serve parts of Belchertown, the systems do not extend to this part of town. The community utilizes on-site septic disposal systems and maintains one water source, Well #1. The well is located in the back of the parcel immediately adjacent to one of the two apartment buildings. The well, approximately 275-feet deep, has an 8-inch diameter casing set above grade and is located at the base of a steep slope.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Little is known about the well as there are no detailed records currently available. The well casing has been raised above grade to about 24-inches and partially protected with a sanitary seal and stone to improve drainage away from the well. Although annual yield of the well has been submitted, maximum month yield data for the well is not available. Therefore, the Zone I and Interim Wellhead Protection Area (IWPA) radii are 163 feet and 469 feet, respectively based on an estimated use from Title 5 flows.

The surficial deposits in the immediate area of the apartments are mapped as thin (0-50 feet) of till. The facility is on the edge (side slope) of a buried bedrock valley. The geology at the apartment is mapped as thin till over granite bedrock, intrusive rocks of the Belchertown complex. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are several activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Non-conforming Zone I,**
2. **Transportation corridor including railroad, and**
3. **Residential homes**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2. Because the railroad is located topographically downgradient and on the edge of the IWPA, the railroad has been reduced from high to moderate threat activity.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	--	--	--	Zone I is not entirely owned and non-conforming land use
Transportation corridors/railroad track	Yes	Yes	Moderate	Monitor drainage to ensure storm water flows away from the well and YOP for railroad.
Residential homes w/parking	Yes	Yes	Moderate	Lawn chemicals and household hazardous materials, including petroleum products
Septic system leachfield	Yes	Yes	Moderate	Microbial threat and improper disposal of hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Non-conforming Zone I** – Currently, the water supplier does not own or control the entire Zone I area. Systems that do not meet DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I area includes both apartment buildings, a storage shed and the septic system for the apartments. Each building has one septic tank and a leachfield for the septic system. The apartments are heated with electricity and there is one pole-mounted transformer on the edge of the Zone I across the street.

### Recommendations:

- V Monitor access to the well casing and runoff from the hillside to prevent potential impacts from surface water.
- V Inform residents regarding the use of BMPs for household hazardous waste management and make available the opportunity for proper disposal of those materials for the tenants.
- V Monitor any proposed land use on Zone I land that is not owned or controlled by Cedarwood.
- V Consider options for acquiring additional property in Zone 1.

**2. Residential Land Uses** – The Zone I and IWPA have high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Although the apartments are heated by electricity, neighboring homes may use a variety of fuels. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the MA DEP website, [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor including railroad** – The well is located approximately 200 feet from the road and the railroad track is along the edge of the IWPA. Accidents and normal use and maintenance of roads and railroads pose a potential threat to water quality. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance, car washing, and accidental spills as well as waste from wildlife and pets. Railroad rights-of-way may pose a potential threat from accidents and maintenance practices.

### Recommendations:

- V Monitor the area to ensure that runoff during heavy storms does not threaten the well. If it is determined that

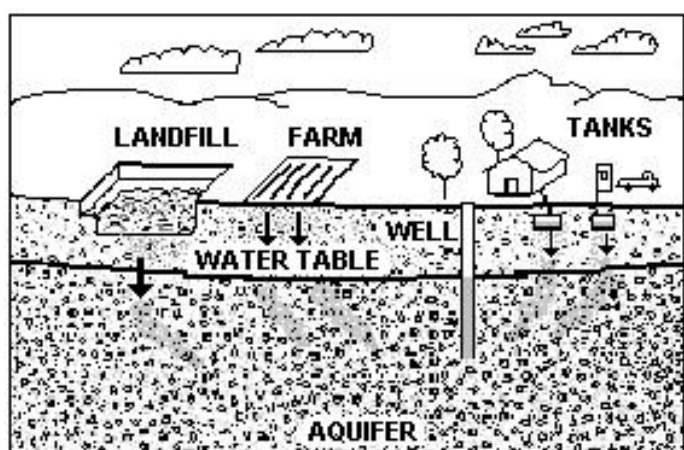


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

runoff backs-up toward the well, consider modifying the ground surface around the well casing to ensure that stormwater does not discharge near the well.

- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, and the Town emergency response (ER) team in the event of an accident near the wellhead. The Town ER team should be made aware of the location of your water system so that they can notify you in the event of an accident near your system.
- ✓ Request that the Selectmen or Conservation Commission, review the Yearly Operating Plan for the railroad to ensure that the railroad is aware of the location of your system's IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Please review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Consider options to control access to the well casing and runoff around the well casing.

### Zone I:

- ✓ Prohibit any new, non-water supply activities within Zone I area that are within your control.
- ✓ As is feasible, remove, relocate or control activities within the Zone I areas that are within your control that may pose a threat to the water quality.
- ✓ Consider well relocation if Zone I threats cannot be mitigated and water quality becomes impaired.
- ✓ Ensure that the well cap is water tight and secure and inspect the cap and the drainage around the well periodically.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism; check parking areas for leaks, etc
- ✓ Continue to maintain road and parking lot drainage in the Zone I away from well.
- ✗ Do not use or store pesticides, fertilizers or road deicing material in the Zone I area that you own or control.

### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete or earthen pads or collars around the well should slope away from the casing to prevent ponding around the well.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead

protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described on the DEP website <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf> - "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation".

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for

## Quabbin Administration Building

### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Quabbin Administration Building
<i>PWS Address</i>	485 Ware Road
<i>City/Town</i>	Belchertown
<i>PWS ID Number</i>	1024011
<i>Local Contact</i>	William Pula
<i>Phone Number</i>	(413) 784-1750

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Section 3 for recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments

## Section 1: Description of the Water System

*Susceptibility: High*

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Well Names	Source IDs
Well No. 1	1024011-01G

The Quabbin Administration Building is located in Belchertown, western/central Massachusetts, immediately adjacent to the Quabbin Reservoir. There is no municipal water supply available or municipal wastewater disposal available at the site, therefore, the facility is served by one on-site groundwater source and on-site septic disposal. The well is a 6-inch diameter bedrock well, 130 feet deep and serves a population of approximately 80 people per day.

Well No. 1 is located along the south shore of the Quabbin Reservoir in Belchertown, Massachusetts inside the hangar facility in the paint shop. Geologic maps indicate thin overburden material on the uplands with some stratified drift deposits in the lowlands along the Swift River valley. The bedrock map indicates the well is located in close proximity to contacts among, metamorphic sequences of sulfidic, mafic and pelitic schist.

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 108 feet and 425 feet, respectively, based on historic, metered water use at the facility.

There is no evidence of a protective clay layer or a thick till layer in the vicinity of the facility. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) throughout the IWPA that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and IWPA.

Currently the well water does not receive treatment. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

## Section 2: Land Uses in the Protection Areas

The land uses for the IWPA for Quabbin Administration Building are predominantly related to the facility's operations. Land uses and activities that are potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Paint Shop
3. Vehicle and Boat Repair/Maintenance
4. Underground Storage Tank
5. Laboratory and Very Small Quantity Hazardous Waste Generator

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.



**1. Non-conforming Zone I** – The Zone I radius for Well No. 1 is 108-feet around the well. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction and restrict the activities in the Zone I to water supply related or other non-threatening activities. Many public water supplies were developed prior to the Department's regulations and contain activities that pose a potential threat to the water supply. The following non- water supply activities occur within the Zone I:

**Non-conforming Zone I:** Although Quabbin Administration Building owns the entire Zone I area, the Zone I contains a portion of Windsor Dam Road, a paint shop, a garage containing diesel and gasoline powered equipment, and some parking spaces.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated and/or water quality is impacted by existing activities.
- ✓? Prohibit any new, non-water supply activities from Zone I.

**2. Paint Shop** – A paint shop is located within the Zone II. If handled improperly leaks and spills of paints and other solvents or chemicals used can potentially contaminate the water supply.

**Recommendations:**

- ✓ Continue to use Best Management Practices for storage, use, and disposal of paints, solvents, and other hazardous materials.

**3. Vehicle and Boat Repair/Maintenance** – A limited amount of vehicle maintenance occurs at the facility. If handled improperly leaks and spills of automotive fluids and cleaning solvents can potentially contaminate the water supply.

**Recommendations:**

- ✓ Continue to use Best Management Practices for storage, use, and disposal of paints, solvents, and other hazardous materials.

**4. Underground Storage Tanks (USTs)** – One 10,000 gallon UST containing No. 2 fuel oil is located within the IWPA at the facility. If managed improperly, underground storage tanks can be potential sources of contamination due to leaks or spills of the chemicals they store.

**Recommendation:**

- ✓ When considering the upgrade and replacement of the UST, consider an above ground tank (AST) located on an impervious surface with proper spill containment. Grant money may be available for the UST removal through the Massachusetts Department of Revenue. See the conclusions in Section 3 below for more information regarding grant/loan programs.

## Glossary

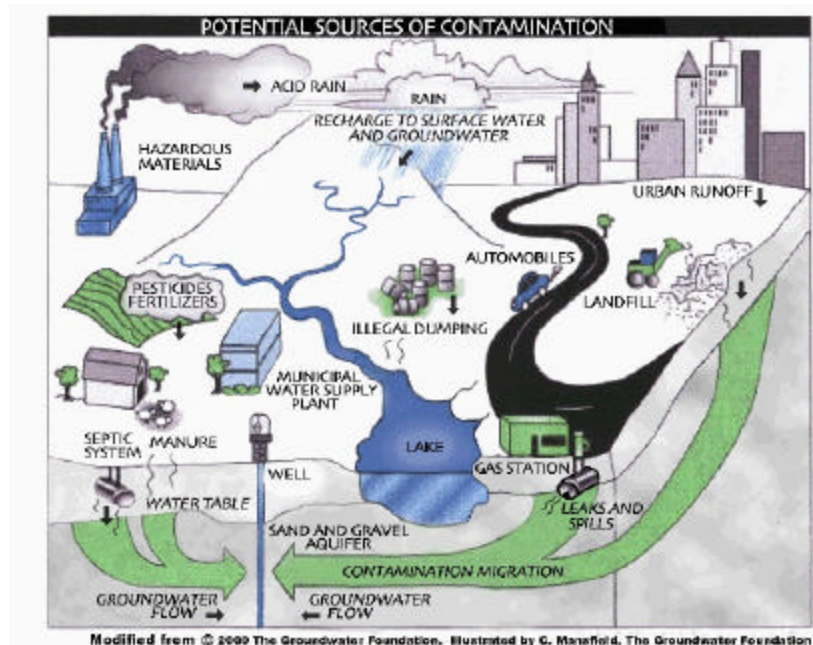
**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.





### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

**5. Laboratory and Very Small Quantity Hazardous Waste Generator –** A laboratory at the facility is listed as a very small quantity generator of hazardous waste. The facility has appropriate permits, and they contract with a licensed hauler to remove the hazardous waste off site. Hazardous waste is a potential source of contamination if it is improperly handled or stored.

#### Recommendation:

- ✓ Continue to handle hazardous waste in compliance with regulations.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

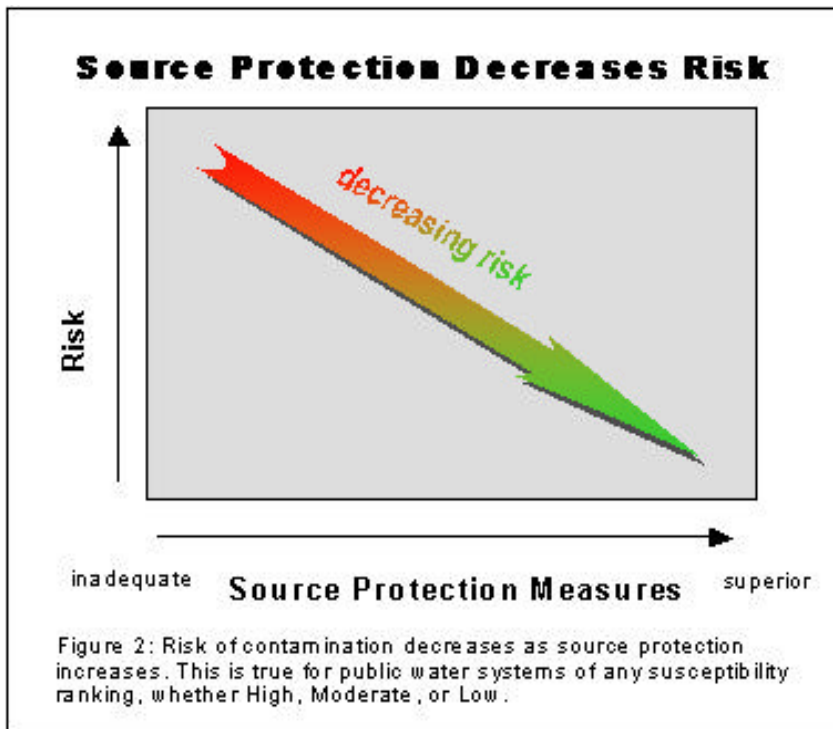
Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Quabbin Administrative Building is commended for implementing BMPs in its paint shop and laboratory and for directing stormwater drainage away from the well. Quabbin Administrative Building should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Regularly inspect all pathways where contaminants could enter the ground from the paint shop and the maintenance garage, including electrical conduits.

#### Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated and water quality is impacted by existing used .
- ✓ Continue to use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and IWPA)**

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Paint Shop	1	High	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Laboratory	1	Moderate	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage
Vehicle/Boat Repair Shop	1	High	Automotive fluids and solvents: spills, leaks, or improper handling
Underground Storage Tanks	1	High	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	1	Low	Hazardous materials and waste: spills, leaks, or improper handling or storage
Lawn Care	1	Moderate	Pesticides: over-application or improper storage and disposal.
Septic Systems	1	Moderate	Hazardous chemicals and microbial contaminants: improper disposal.
Stormwater Drains/Retention Basins	-	Low	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns.

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

(Continued from page 4)

- ✓ Continue to keep the storage of pesticides, fertilizers and road salt outside of the Zone I.

### Training and Education:

- ✓ Continue to train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides within the IWPA.
- ✓ Septic system components should be inspected and maintained on a regular basis.
- ✓ Verify that MODF in the transformers has been replaced with no-PCB oils. Keep the area near any transformer free of tree limbs that could endanger the transformer in a storm.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Quabbin Administrative Building management and staff should use this SWAP report to review drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



# Massachusetts Department of Environmental Protection

## Source Water Assessment Program (SWAP) Report

### For Washington Acres

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 20, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Washington Acres
<i>PWS Address</i>	N. Washington Road
<i>City/Town</i>	Belchertown, Massachusetts
<i>PWS ID Number</i>	1024015
<i>Local Contact</i>	Mr. George Adams
<i>Phone Number</i>	508-385-4430

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1024015-01G	163	459	Moderate

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

Washington Acres is a small rural, residential apartment complex that serves 12 homes in southeastern section of Belchertown with a community of approximately 30 people. Although municipal water and sewer serve parts of Belchertown, the systems do not extend to this part of town. The community utilizes on-site septic disposal systems and maintains one water supply well #1. The well is located in the front of the parcel and has a 6-inch casing of unknown depth.

The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

significantly larger or smaller than the IWPA. Little is known about the well as there are no records currently available. The well casing had previously been below grade in a well tile but was recently raised above grade to protect against inundation of the casing by stormwater. There is no yield data for the well and the source has only recently had a meter installed to determine actual usage. The Zone I and Interim Wellhead Protection Area (IWPA) radii for the apartment's well are 163 feet and 469 feet, respectively based on an estimated use from Title 5 flows

The surficial deposits in the immediate area of the apartments are mapped as thin (<50 feet) stratified drift deposits with some higher areas of till or bedrock covered with a thin layer of till. The bedrock is mapped as intrusive rocks of the Belchertown complex, predominantly quartz diorite and monzodiorite. Based on the geologic maps of the area, the well is assumed to be drawing from the bedrock aquifer. The well is located in an area of thin unconfined sand and gravel deposits where there is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are several activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Zone I ownership,**
2. **Transportation corridor including railroad,**
3. **Residential homes**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridors/railroad	Yes	Yes	Moderate	Monitor drainage to ensure storm water flows away from the well
Residential homes w/parking	Yes	Yes	Moderate	Lawn chemicals and household hazardous materials, including petroleum products
Septic systems	Yes	Yes	Moderate	Microbial threat and improper disposal of hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Non-conforming Zone I** – Currently, the water supplier does not own or control the entire Zone I area. Systems that do not meet DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I area includes two of the apartment buildings, one private residence, part of the road and the septic system for one of the buildings. Each building has two septic tanks, a drywell for the laundry and a leachfield for the septic system. The parking areas are paved with curbs and no drains. The curb next to the well protects the well from parking lot and street runoff. The apartments are heated with electricity and there is one pole-mounted transformer on the edge of the Zone I across the street.

### Recommendations:

- ✓ Continue to control access to the wellhead area and make every effort to acquire Zone I control or ownership.
- ✓ Inform residents regarding the use of BMPs for household hazardous waste management and make available the opportunity for proper disposal of those materials for the tenants.

**2. Residential Land Uses** – The Zone I and IWPA have high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Although the apartments are heated by electricity, neighboring homes may use a variety of fuels. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

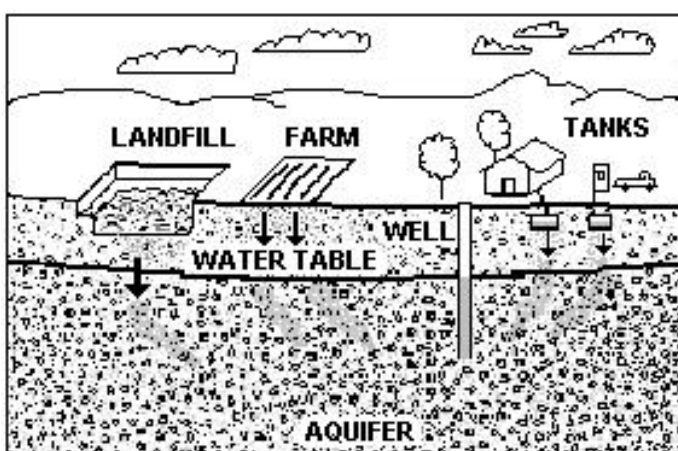


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor including railroad** – The well is located less than 25 feet from the road and the railroad track is within the IWPA. Accidents and normal use and maintenance of roads and railroads pose a potential threat to water quality. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. Railroad right-of-ways may pose a potential threat from accidents and maintenance practices. Because the railroad is on the edge of the IWPA, the



### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

threat associated with that activity was reduced from high to a moderate threat.

### Recommendations:

- ✓ Monitor the area to ensure that runoff during heavy storms does not threaten the well. If it is determined that runoff backs-up toward the well, consider modifying the ground surface around the well casing to ensure that stormwater does not discharge near the well.
- ✓ Prepare an Emergency Response Plan that includes coordination among the DEP, you (the water supplier), and the Town emergency response (ER) team in the event of an accident near the wellhead. The Town ER team should be made aware of the location of your water system so that they can notify you in the event of an accident near your system.
- ✓ Request that the Selectmen or Conservation Commission, review the Yearly Operating Plan for the railroad to ensure that the railroad is aware of location of your systems' IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. You are commended for current protection measures such as paving the parking area and installing curbs to protect the well casing and for extending the well casing above ground. Please review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Continue to maintain septic systems and monitor activities around the well casing.

### Zone I:

- ✓ Prohibit any new, non-water supply activities within Zone I.
- ✓ As is practical, relocate or control activities that are within the Zone I that are not specific to the supplying of water.
- ✓ Consider well relocation if Zone I threats cannot be mitigated and water quality becomes impaired.
- ✓ Periodically inspect the well casing to ensure the cap is water tight and secure.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism; check parking areas for leaks, etc
- ✓ Continue to maintain road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road deicing material within the portions of the Zone I that are within your control.

### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

- ✓ Concrete or earthen pads or collars around the well casing should slope away from well to prevent ponding of water at the casing.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described on the DEP website <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf> - "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation".

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Village Greene Condominium Association

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
October 16, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Village Green Condominium Association</b>
<b>PWS Address</b>	<b>40 Ware Road</b>
<b>City/Town</b>	<b>Belchertown, Massachusetts</b>
<b>PWS ID Number</b>	<b>1024016</b>
<b>Local Contact</b>	<b>Mr. John Sullivan</b>
<b>Phone Number</b>	<b>413-323-0649</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone 1 (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well Bldg #1	1024016-01G	100	410	Moderate
Well Bldg #2	1024016-02G	100	410	Moderate
Well Bldg #3	1024016-03G	100	410	Moderate
Well Bldg #4	1024016-04G	100	410	Moderate
Well Bldg #5 & #8	1024016-05G	100	415	High
Well Bldg #6	1024016-06G	100	410	High
Well Bldg #7	1024016-07G	100	410	High
Well Bldg #9	1024016-08G	100	410	High
Well Bldg #10	1024016-09G	240	592	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## 1. Description of the Water System

Village Greene Condominium Association (Association) is a small, residential condominium community in Belchertown, with twenty-one homes in ten buildings. Although Belchertown has municipal water and sewer, the area where the Association is located, is not connected to either the municipal water or sewer systems. Therefore, the Association homes as well as the surrounding homes and facilities, are served by on-site septic disposal systems and non-municipal, public or private water supplies. The Association maintains nine water supply wells 01G through 09G with one well per building with the exception of one source (05G) that serves two buildings. Wells 01G through 07G are clustered together in the southeastern section of the property and are located distances ranging from approximately 60 to 80 feet apart. There presently, is no metered flow data to determine actual water use from each well. The one exception is well 09G, which is a flowing artesian well that free flows at an estimated rate of 6 gallons per minute (gpm) or 8,640 gallons per day (gpd). The estimated water use from each of the other wells (01G through 08G) was based on the Title 5 septic system design flow volumes of 110 gallons per bedroom. Therefore the estimated use from each well is less than 1,000 gallons per day.

The Zone I is the protected area immediately surrounding the wellhead, while the Interim Wellhead Protection Area provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPA's are based on the amount of water withdrawn from each well. Wells 01G through 08G have an estimated use of less than 1,000 gallons per day. The Zone I radius for wells 01G through 08G, based on estimated use, is 100 feet. The IWPA radius for wells 01G, 02G, 03G, 04G, 06G, 07G and 08G is 410 feet. The IWPA radius for well 05G is 415 feet because it serves two buildings and is assumed to use more water. The Zone I and IWPA radii for well 09G are 240 feet and 592 feet, respectively, based on the free flow rate of 6 gpm.

There is very little data available about the wells, other than the pumps are set at

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	Wells 05G-09G	--	--	Septic systems, homes, parking, roadway
Hazardous materials storage and use	--	Well 09G	High	Encourage the Board of Health to inspect facilities to encourage the use of BMPs and assist in regulatory compliance.
Septic systems	05G-07G	All	Moderate /High	Microbial contaminants and potentially hazardous materials from improper disposal.
High density residential with on-site parking	Wells 05G-09G	All	Moderate	Use BMPs for household hazardous waste, heating fuel, septic system management, and lawn care and stormwater runoff.
Gravel operation	--	Wells 01G-07G	Moderate	Accidental release from heavy equipment, potential for illegal dumping
Transportation corridor: local roads and State Route 9	08G	08G & 09G	Moderate	Limit road salt usage and provide drainage downgradient from wells

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

approximately 70 to 80 feet below grade. Well drilling invoices obtained from the Belchertown Board of Health for the Association's wells, show the depths to which the wells were drilled and the amount of casing used to complete the well. Based on that information, it was determined that all of the wells are completed in bedrock and range in depth from 80 to 125 feet deep. There are no drillers' records available of the type of material encountered during drilling. The geologic maps published for the area indicate stratified glacial drift (sand and gravel deposits) to depths of approximately 60 feet. The maps do not indicate a continuous clay protective layer in the area. A well log for a recently installed well on an adjacent property indicated a clay layer at a depth of approximately 30 feet. However, there is no indication of a continuous confining protective clay unit in the area. The bedrock in the area is mapped as quartz monzodiorite gneiss associated with the Belchertown Complex and is highly folded and faulted rock. Wells located in this type of hydrogeologic environment are considered to have a high vulnerability to contamination due to the absence of a continuous hydrogeologic barrier that can prevent contaminant migration from activities conducted on the ground surface in the immediate vicinity of the well(s).

The wells serving the facility do not have treatment at this time. For current information on water quality monitoring results, please request a copy of the most recent Consumer Confidence Report from the Public Water System contact person listed above in Table 1. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for the wells are entirely within the town of Belchertown and include several activities that pose a threat to the water supplies.

### Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential land uses with on- site septic disposal and parking,**
3. **Transportation corridors,**
4. **Hazardous materials handling, and**
5. **Comprehensive Protection Planning.**

The overall ranking of susceptibility to contamination for the Village Greene Condominium Association is high, based on the presence of at least one high threat ranked land use or activity in the Zone I and IWPA of one of the sources. Please refer to Table 2 for more details.

**1. Non-conforming activities within Zone I** – Currently, the water supplier does not own or control the entire Zone I area for the sources. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I for Wells 05G through 07G have portions of septic systems within the Zone I protection area. One or two of the cesspools on site either are in failure or are anticipated to be in failure in the near future. Therefore, the threat ranking for the septic systems has been increased from a moderate to a high-risk ranking. The Zone I for well 09G includes one of the residential units and its yard and a portion of Route 9. The Zone I for well 08G includes residential units, driveways, roadways and at least one septic system. Well 08G is secured within a cement covered pit in the driveway of one of the units.

### Recommendations:

- V To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- V Inspect the ground around the casings and the integrity of the casings and caps to ensure the wells are protected from surface influences and the caps are secure.

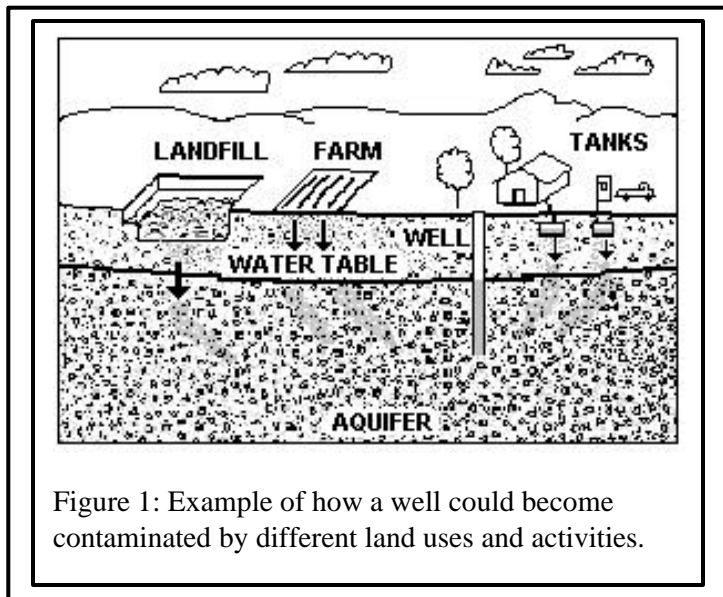


Figure 1: Example of how a well could become contaminated by different land uses and activities.

- ✓ Inspect the abandoned casing near the cluster of wells to ensure the casing is secure and the ground around the casing is sloped to prevent infiltration along the casing annulus. Consider developing a long-term plan to decommission the boring in the future to prevent accidental contamination of the aquifer through that boring.
- ✓ Where it is feasible, remove all hazardous materials from Zone I including household hazardous materials. Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals, maintenance chemicals and vehicles used to access the area. Include all pool chemicals in you management plans.
- ✓ Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.
- ✓ Ensure that residents are aware of best management practices (BMPs) with respect to hazardous materials handling, household hazardous materials handling and disposal and proper use of lawn chemicals.

- ✓ Short term and long term plans must consider wastewater and water supply protection options. Consider consolidation of the system, relocation of source(s) and wastewater disposal options.

**2. Residential Land Uses** – The Zone Is for some of the wells and IWPA for all of the wells have high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridors** – The access road and Route 9 are located within the Zone I and/or IWPA of the wells. Accidents and normal use and maintenance of roads pose a potential threat to water quality. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- ✓ Inspect the roadways to determine the discharge points of road runoff, as is feasible, for well 08G and 09G. If it is determined that runoff discharges toward the wells, consider modifying the ground surface around the well casings to ensure that stormwater does not discharge near the wells.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the Association, and the Town emergency response (ER) team in the event of an accident near the wellhead. The Town ER team should be made aware of the location of your water system so that they can notify you in the event of an accident near your system.



#### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

**4. Hazardous Materials Storage and Use** – Within the IWPA of Well 09G, there is at least one commercial facility that stores or utilizes hazardous materials. In addition, portions of a gravel operation are located within the IWPA of several of the wells: 01G through 04G. Many businesses use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Gravel operations in and of themselves do not necessarily impact water supplies. However, proximity of excavation to the water table, use, storage and refueling of heavy equipment in a gravel pit pose a risk from petroleum products. Gravel pits can be sites of illegal disposal of potentially hazardous materials unless access is controlled.

#### Hazardous Materials Storage and Use Recommendations:

- V Educate local businesses and municipal departments regarding the use of best management practices for protecting water supplies. Distribute the fact sheets “Businesses Protect Drinking Water” and “DPWs Protect Drinking Water” available in Appendix A; they are also available online at the DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common business issues.
- V Work with the local Board of Health, the municipality and businesses to register facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- V Educate local businesses and town officials and assist the Board of Health in understanding the Massachusetts and local floordrain requirements. See the brochure “Industrial Floor Drains” for more information.

**5. Comprehensive Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Belchertown does have aquifer protection bylaws and health regulations. Although the protection measures are not fully in compliance with DEP requirements, according to the health agent, the Board will be considering suggested revisions to bring the regulations into compliance with the DEP requirements. Wellhead protection planning identifies protection strategies and establishes a timeframe for implementation. The Association has a number of issues to address for short and long term planning for protection of the water supplies and a Wellhead Protection Plan could be a useful tool for organizing a strategy for future protection.

#### Protection Planning Recommendations:

- V Consider preparing a Wellhead Protection Plan. Contact Northeast Rural Water Association for some assistance in developing a comprehensive plan.
- V For short and long term planning, the Association should consider consulting with a professional to review all water and wastewater issues at the facility.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Association should carefully review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- V Conduct a comprehensive review of water and wastewater issues at the facility.
- V Monitor activities near the wells. Use BMPs and avoid the use and misuse of household hazardous materials near the wells, especially those proximal to homes.

#### Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- V If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that

would prohibit potentially threatening activities, a Memorandum of Understanding or a Right of First Refusal to purchase the property. Consider consolidating sources and utilize the most protected source with consistent, good water quality.

- V Redirect road drainage in the Zone I away from well area.
- V Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.

### **Training and Education:**

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- V Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- V Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

### **Planning:**

- V Have a plan to address short-term water shortages and long-term water demands and wastewater issues.
- V Keep the phone number of a bottled water company readily available in the event of an emergency.
- V Work with the Board of Health in their continuing efforts to adopt floor drain regulations and aquifer protection regulations.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, the Department posts a new Request for Response for the Grant program (RFR). Funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheets

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## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
MAV000015090	Dory Jeep	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Sale & Service
MV4133235435	Devon Lane Power Equipment	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Sales & Service
MAV000016693	H F Greene & Son	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Construction

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

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# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
EVERGREENE GOLF CENTER



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Evergreene Golf Center
<b>PWS Address</b>	Ware Rd
<b>City/Town</b>	Belchertown, Massachusetts
<b>PWS ID Number</b>	1024018

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1024018-01G	100	422	Low	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

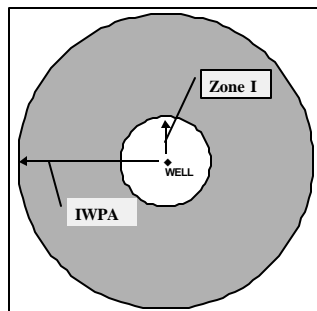
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1024018-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How Was My Well's Susceptibility Determined?

Your well's **low** susceptibility to potential microbial threats is based on no septic system components within the Zone I or IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the gravel mining operation and golf driving range within the IWPA.

This source water assessment report is based on information provided by you on your New Source Approval Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Bernardston Fire & Water District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Bernardston Fire & Water District
<i><b>PWS Address</b></i>	259 Bald Mountain Road
<i><b>City/Town</b></i>	Bernardston
<i><b>PWS ID Number</b></i>	1029000
<i><b>Local Contact</b></i>	Mr. Russell Dean
<i><b>Phone Number</b></i>	413-648-9088 or 413-648-9656

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

<b>Zone II #: 443</b>	<b>Susceptibility: High</b>
<b>Well Names: Barton Road Wells</b>	
Well #2—New drilled well	1029000-02G
<b>Zone II #: 444</b>	<b>Susceptibility: High</b>
Sugarhouse Well	1029000-03G

Bernardston is a small, rural community in western Massachusetts along the Vermont border. The town is predominately hilly, with a portion of the south central and south eastern portions of town within a valley area and a narrow valley along the Fall River. As with most hilltowns, the town center and developed areas are located primarily along the valley floors. There are two wells serving the Bernardston Fire and Water District; one additional well, (1029000-01G) is severed from the system and designated as an emergency source. Although the emergency well (01G) is not discussed further in this report, 01G is physically adjacent to and within the same aquifer as Well #2 (02G). Well #2 (1029000-02G) is located within the Deerfield River Basin in the southern edge of town, west of Greenfield Road off Barton Road near the baseball diamond. Well #2 is an eight-inch diameter, 87-foot deep well, has an approved pumping rate of 50 gallons per minute (GPM) and a Zone I protective radius of 379-feet. Well #3, the Sugarhouse Well (1029000-03G) is located within the Connecticut River Basin, south of Burke Flat Road between Route 5 and Interstate 91. Well #3 is an 18 x 24-inch gravel packed well, 88 feet deep,

has an approved pumping rate of 430 GPM (0.62 MGD), and a 400-foot Zone I radius. The Zone II, primary recharge areas, were delineated for well #2 and #3 based upon their approved pumping rates. The Zone IIs were delineated through the SWAP program utilizing data develop during long duration pumping tests, geologic mapping and analytical modeling.

Well #2 utilizes water from a buried valley, sand and gravel aquifer adjacent to the Mill Brook. Although there is some evidence of fine sand and silt, the aquifer is unconfined. The bedrock underlying the well site is mapped as the Sugarloaf Formation, a Triassic age red or gray arkose that laterally and vertically grades into a coarse arkose conglomerate.

As noted previously Well #2 and Well #3 are located in different watersheds and therefore distinct aquifers. Well #3 is located in the buried valley, sand and gravel, unconfined aquifer adjacent to the Fall River. There is no evidence of a potentially confining (protective) clay layer. The bedrock mapped in the vicinity of well #3 is the Bernardston Formation, a fine-grained phyllite with interbeds of thin quartzite. Both wells are located in unconfined aquifers. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

Water from both sources is treated with potassium hydroxide as pH adjustment for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

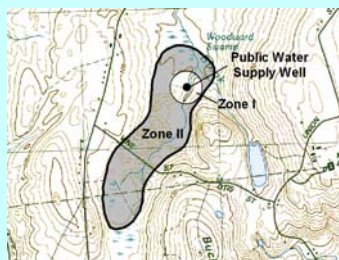
## Section 2: Land Uses in the Protection Areas

Although the wells are within two distinct Zone IIs, there are similar some land use activities that area common within both Zone IIs. The Zone II for Bernardston is a mixture of residential, agricultural, forested, and minimal industrial/commercial land uses (refer to attached map for details). Land uses and activities that are potential sources

of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Key Land Uses and Protection Issues include:

1. Nonconforming activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Comprehensive wellhead protection planning
6. Agricultural activities

The overall ranking of susceptibility to contamination for well #2 is moderate, while well #3 (Sugar House Well) has a high ranking, based on the threatening land uses within the water supply protection areas, as seen in Table 2.

**1. Nonconforming Activities in Zone Is** – Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and the Zone I may contain non-water supply activities such as homes and public roads. The

District does not own or control all of the Zone I for either well. Passive recreation at the baseball field, associated parking and a commercial, light manufacturing facility are located within the Zone I of Well #2. Cornfield and derelict farming facilities associated with the annual maple sugaring activities are located within the Zone I of Well #3.

### Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities and debris from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Monitor all activities and proximal to the Zone I.
- ✓ Investigate the potential of acquiring the remaining land in Zone I or entering into conservation restrictions or an agreement of Right of First refusal for the land.

**2. Residential Land Uses** – Approximately 16% of the Zone II areas consist of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**3. Transportation Corridors** – Within the Zone II areas, 13% of the land is used for transportation corridors. Interstate 91 runs through the entire Zone II #444, and local roads are common throughout both Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Provide a map of the Zone II area to MA Highway Department to ensure they are aware of the location of Bernardston's wells. Consider requesting the areas be designated low salt application areas.

**4. Hazardous Materials Storage and Use** – One percent of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or

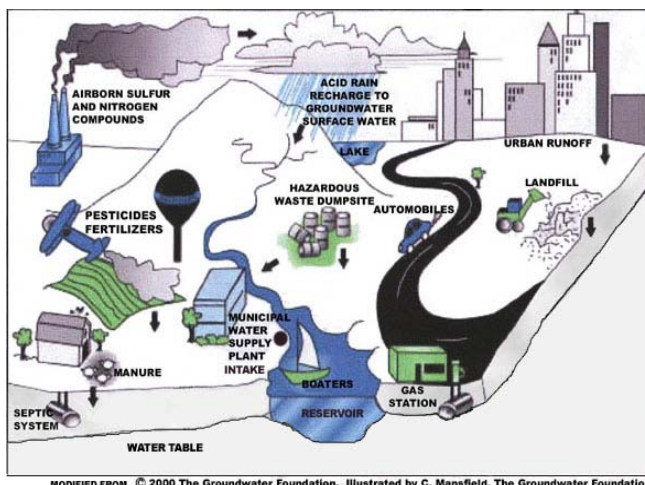


Figure 1: Sample watershed with examples of potential sources of contamination

disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

#### Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II	Potential Contaminant Sources*
<b>Agricultural</b>				
Dairy Farms	1	M	444	Manure (microbial contaminants): improper handling
Livestock Operations	1	M	444	Manure (microbial contaminants): improper handling
Manure Storage or Spread-	1	H	444	Manure (microbial contaminants): improper handling
<b>Commercial</b>				
Service Stations/ Auto Repair	1	H	444	Automotive fluids and solvents: spills, leaks, or improper handling
<b>Residential</b>	<b>85.3 acres total</b>			
Fuel Oil Storage (at resi-	Numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cess-	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Stormwater Drains/ Retention Basins	Numerous	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	66.7 acres	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



practices.

- ✓ Work with the Board of Health to inspect and educate local businesses with respect to Massachusetts floordrain requirements and hazardous materials handling (including household type hazardous materials). See brochure “Industrial Floor Drains” for more information.

**5. Agricultural Activities** – Within both Zone II areas, a total of 44% of the land is used as crop or pasture land. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Provide a map of the protection areas to ensure the farmers have accurate information about the protection areas.

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased groundwater monitoring and treatment
- Water supply clean up and remediation
- Replacing a water supply
- Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**Potential Source of Contamination vs. Actual Contamination**

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

- ✓ Provide the attached information on BMPs for manure and pesticide management to land owners

**6. Protection Planning** – Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). Refer to recommendations in the SWAP Zone II report.
- ✓ Work with the Board of Health to adopt floordrain controls that meet 310 CMR 22.21(2).
- ✓ Recommend that the Planning Board and board of Health contact the Department if they require assistance with implementation of protection controls.

Other land uses and activities within the Zone II areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.



### Additional Information:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

## Section 3: Source Water Protection Conclusions and Recommendations

### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Utilizing tight tanks at the baseball diamond facility.

### Source Protection Recommendations:

To better protect the sources for the future:

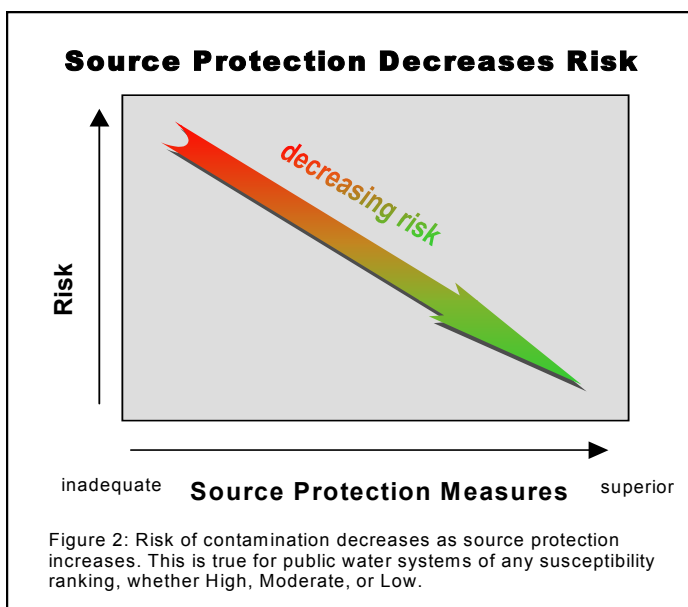
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
  - ✓ Educate residents on ways they can help you to protect drinking water sources.
  - ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents. Where possible, utilize deep sump pits for stormwater drainage management.
  - ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Encourage the use of Best Management Practices by farmers, residents, businesses, and industries.
  - ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
  - ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
  - ✓ Develop and implement a Wellhead Protection Plan.
  - ✓ Work with the Board of Health to develop and implement a floor drain regulation to further protect your water supply.

### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the



**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	To the extent possible, remove non-water supply activities from each Zone I to comply with DEP's Zone I requirements. Investigate options for gaining ownership or control of the Zone I. Require nutrient management in cornfield and removal of junk near Sugar house well.
Are the Zone I areas posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone 1 areas regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone 1?	<b>NO</b>	Monitor non-water supply activities in Zone I and investigate options for removing these activities.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)	<b>YES</b>	Continue working with the Planning Board and the Board of Selectmen to maintain land use controls that meet 310 CMR 22.21(2). Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a local wellhead protection plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	<b>NO</b>	Create committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	Work with the Board of Health to develop and implement a floor drain regulation to further protect your water supply. For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide watershed protection education?	<b>NO</b>	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Blandford Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Blandford Water Department
<i><b>PWS Address</b></i>	Main Street, P.O. Box 7
<i><b>City/Town</b></i>	Blandford
<i><b>PWS ID Number</b></i>	1033000
<i><b>Local Contact</b></i>	Mr. Frank Burkott
<i><b>Phone Number</b></i>	413-848-2098

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

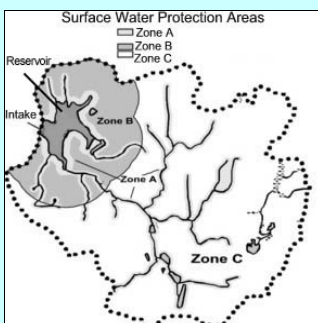
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

*Susceptibility:* Moderate

<i>Source Name:</i>	<i>Source ID:</i>
Long Pond Reservoir	1033000-01S

Blandford is a small, rural hilltown community in southwestern Massachusetts. The Blandford Water Department utilizes Long Pond Reservoir as the sole source of water for a portion of the Town of Blandford. Long Pond (1033000-01S) is an 81 acre impoundment holding approximately 65 million gallons of water. The watershed is part of the Cobble Mountain Reservoir watershed, the water source for the Springfield Water and Sewer Commission. The land uses within the Long Pond watershed is primarily forested upland (78%) with the remaining watershed consisting of residential and non-commercial agricultural activities, primarily hay. The Water Department owns approximately 60% of the watershed. Due to loss of their waiver from filtration in 2000, Blandford has signed an Administrative Consent Order to either develop an alternate water supply or filter the source. Please refer to the attached map to view the boundaries of the protective zones.

Prior to distribution, the pH of the water from the reservoirs is raised with soda ash for corrosion control and the water is disinfected with chlorine prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoir. However, due to the nature of surface water supplies and the current unfiltered status of the reservoir, the source is considered highly vulnerable to potential contamination. In fact naturally occurring bacteria present in the intestines of animals and in the soils can pose a significant threat to water quality of surface water supplies through runoff. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Residential land use in Zone A and watershed
2. Forest/Watershed management
3. Transportation corridors

The overall ranking of susceptibility to contamination for the system from controllable land use activities is moderate, based on the presence of several moderate threat land use within the water supply protection areas, as seen in Table 2. It is important to reiterate that surface water supplies are considered highly vulnerable to anthropogenic and naturally occurring threats.

**1. Residential Land Uses** – There are three residences located within the Long Pond watershed. None of the areas have public sewers, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the

groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Consider negotiating a Right of First refusal agreement or conservation restrictions for land not currently owned by the Town.

**2. Transportation Corridors** - Gibbs Road transects the watershed of Long Pond on the northwest side, and there are other local roads within the watershed. Gibbs Road and the trail that runs toward the reservoir intake are of particular concern due to their proximity to the pond. Inspect the area regularly for erosion and runoff issues and correct them as appropriate. Typical roadway maintenance and use can pose a potentially significant source of contamination from accidents and washouts along dirt roads. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater washed into catch basins and discharge into the reservoirs.

#### Transportation Corridor Recommendations:

- ✓ Inspect drainage along roads in the watershed. Make every effort to ensure stormwater discharges outside of the protection areas as feasible or allowed to settle before entering feeder streams. Consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of Long Pond.
- ✓ Work with local emergency response teams to ensure effective management of potential spills.

**3. Protection Planning** – Currently, Blandford and Otis do not have Watershed Protection Districts and protective bylaws.

#### Protection Planning Recommendations:

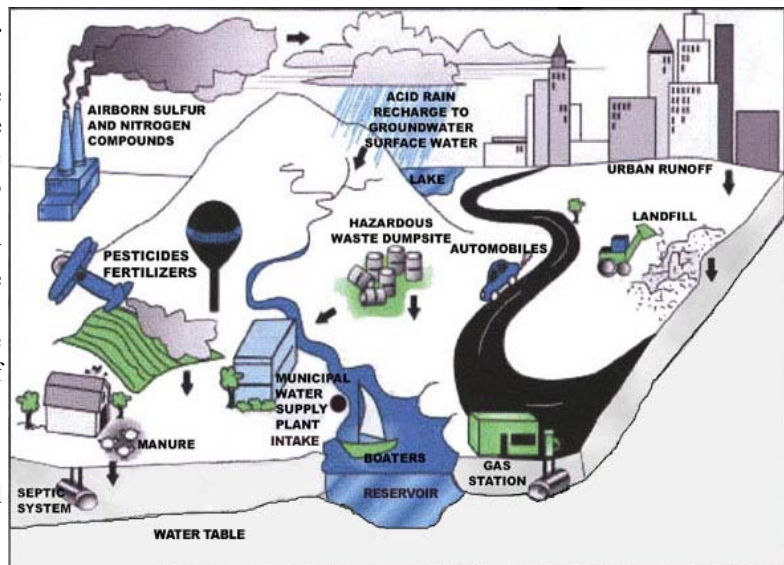
- ✓ Coordinate efforts with local officials to compare local watershed protection

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Figure 1: Sample watershed with examples of potential sources of contamination



controls with current MA Watershed Protection Regulations 310 CMR 22.21(2). Include Otis in the protection plans. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system's Zone C contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership of most of the watershed
- Performing clean-up of old farm dump near Long Pond.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watershed and to cooperate on responding to spills or accidents.
- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a best management practices for residential and recreational uses.
- ✓ Inspect stormwater drainage along roads in the watershed. Make every effort to ensure stormwater discharges outside of the protection areas. Alternatively consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of Long Pond.

- ✓ Inspect, maintain, and clean catch basins on a regular schedule.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring, about May 1, the Department posts a new Request for Response (RFR- the grant application form) for the grant program.



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

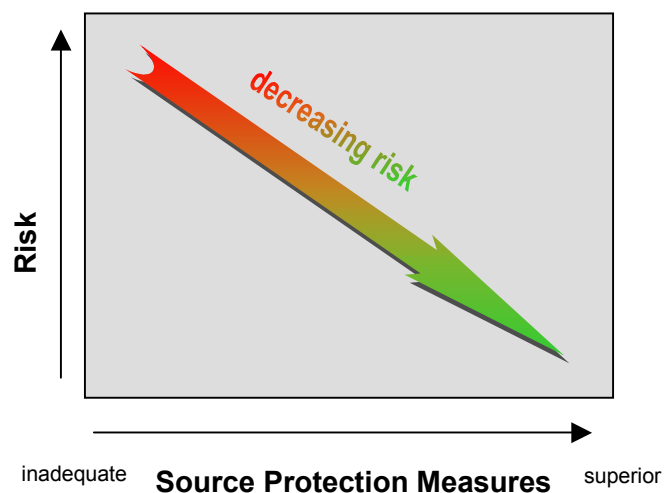


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Haying -- No fertilizers or pesticides	2	M	Accidental fuel spill.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Transportation Corridors/Roads and trails (Legal/illegal access)	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. Illegal access to watershed.
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone C. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## Section 4: Appendices

- A. Protection Recommendations
- B. Additional Documents on Source Protection

### For More Information

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>NO</b>	The Town Watershed Protection bylaw is in compliance DEP's regulations. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include the watershed in their protection controls.
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>YES</b>	Update the surface water supply protection plan as necessary. Follow "Developing a Local Surface Water Supply Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>Not Applicable</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide watershed protection education?	<b>NO</b>	Aim additional efforts at the public and neighboring community.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Meadowbrook Acres Mobile Home Park

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 22, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Meadowbrook Acres Mobile Home Park
<b>PWS Address</b>	State Route 20
<b>City/Town</b>	Brimfield, Massachusetts
<b>PWS ID Number</b>	1043001
<b>Local Contact</b>	Mr. William Enser
<b>Phone Number</b>	(413) 243-1416

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Upper Well	1043001-01G	248	616	High
Lower Well	1043001-02G	248	616	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Meadowbrook Acres Mobile Home Park (the Park) is located on Route 20 in Brimfield near the western border with Monson. The Park is comprised of approximately 95 trailers, an administration building, a clubhouse, and other associated facilities. The total population ranges from approximately 130 people year-round to 150 people seasonally. The facility is served by two potable supply wells, the Upper well (01G) and the Lower well (02G). There is no municipal wastewater disposal facility in

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Brimfield; therefore, wastewater from the facility is disposed of through on-site, individual septic systems. The facility is in the process of changing the wastewater disposal from individual septic systems throughout the park to a combined system away from the wells. The facility has received a groundwater discharge permit and has a system design but presently does not have available funds to complete the construction.

The Upper well is a 280-foot deep, 6-inch diameter, bedrock well located below grade in a vault. The Lower well is a 260-foot deep, 6-inch diameter bedrock well also located in a vault below grade. Geologic mapping in the area indicates thin overburden deposits of sand and gravel less than 50 feet deep. The Lower well is likely in relatively thin stratified drift, deposited by receding glaciers some 14,000 to 18,000 years before present. Recent streams and rivers may have reworked the sand and gravel and deposited recent alluvium. The Upper well is likely on the edge of the valley with only thin till layer over bedrock. The bedrock in the area is mapped as intrusive rocks and their metamorphic equivalents of the Bronson Hill Formation, predominantly schist.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water are allowed to occur or other non-threatening activities. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The Zone I and IWPA protective radii for both wells 248 feet and 616 feet, respectively. These protective radii were calculated based on the metered water use from the two highest months of use from the Upper well. Please refer to the attached map that shows the Zone Is and IWPAs. The Zone I areas are not conforming to current DEP requirements. The Zone I areas include residences, parking areas, roadways, fuel oil/kerosene storage, and septic tanks. The IWPAs include the remainder of the facility, Route 20 and a utility right-of-way.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to regularly monitor the quality of the water. For current information on

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
High density residential land use	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells. Provide information about BMPs
Fuel Storage Above Ground	Yes	Yes	Moderate /High	Require proper maintenance and upgrades to fuel oil/kerosene tanks to prevent releases from occurring. Encourage propane use.
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn care/gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Transportation corridors/right-of-way	Yes	Yes	Moderate	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and,**
3. **Transportation corridors including railroad.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone I or other non-threatening activities. The facility's Zone Is contain septic systems, driveways, roads, and residences. Systems not meeting DEP Zone I requirements must receive DEP approval prior to any activity and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Work with residents within Zone I to encourage the replacement of fuel oil or kerosene heat with propane heat and to properly remove the fuel oil/kerosene tanks from the residence if they do convert to an alternative heating source.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway drainage in the Zone I away from the well.
- ✓ Relocate septic systems outside of the Zone I.
- ✓ Consider establishing age and condition standards for fuel tanks and incentives for converting to propane.

**2. Residential Land Uses** - The residences have on-site septic systems. If managed

improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential

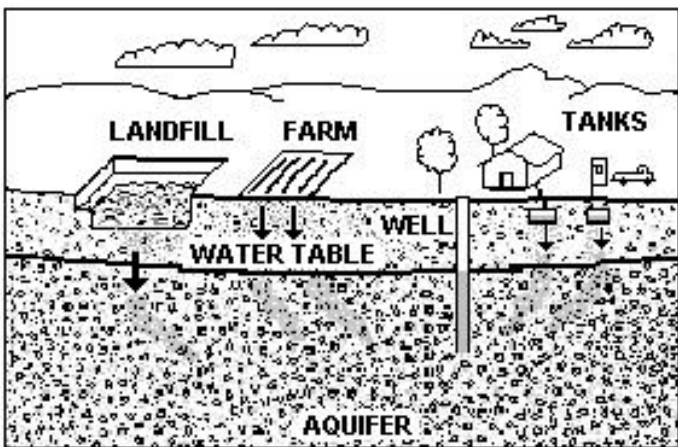


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation corridor including railroad** – The well is located less than 25 feet from the road and the railroad track is within the IWPA. Accidents and normal use and maintenance of roads and railroads pose a potential threat to water quality. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance, car washing, and accidental spills as well as waste from wildlife and pets. Railroad right-of-ways may pose a potential threat from accidents and maintenance practices.

### Recommendations:

- ✓ Monitor the area to ensure that runoff during heavy storms does not threaten the well. If it is determined that runoff backs-up toward the well, consider modifying the ground surface around the well casing to ensure that stormwater does not discharge near the well.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the Town emergency response (ER) team in the event of an accident near the wellhead. The Town ER team should be made aware of the location of your water system so that they can notify you in the event of an accident near your system.
- ✓ Request that the Selectmen or Conservation Commission, review the Yearly Operating Plan for the railroad to ensure that the railroad is aware of location of your systems' IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Park is commended for having securely locked covers over the wellheads and monitoring activities near the wells. Continue to move toward funding the upgrade of the septic systems. The Park should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Encourage the replacement of fuel oil or kerosene heat with propane heat so that oil/kerosene tanks can be removed from the Zone Is.
- ✓ Relocate septic systems outside of the Zone Is.

### Zone I:

- ✓ Aboveground storage tanks that cannot be removed from your Zone Is should be located on an impermeable surface, and should a spill occur, containment should be large enough to hold the complete liquid volume of the tank.
- ✓ Prohibit new, non-water supply activities from the Zone Is.
- ✓ Restrict use of salt within Zone Is and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of Zone Is, check any aboveground tanks for leaks.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to develop and include the IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Source Water Assessment Program (SWAP) Report

## For

### Brimfield Housing Authority



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 5, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Brimfield Housing Authority</b>
<i>PWS Address</i>	<b>Colonial Park, US Route 20</b>
<i>City/Town</i>	<b>Brimfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1043002</b>
<i>Local Contact</i>	<b>Director, Virginia T. Butler</b>
<i>Phone Number</i>	<b>413-245-7056</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	01G	240	590	HIGH

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

#### Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Massachusetts Department of Environmental Protection (MA DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attached Map of the Protection Areas
5. Attachments

## 1. DESCRIPTION OF THE WATER SYSTEM

#### Well # 1

The Brimfield Housing Authority (Housing Authority) is an elderly housing complex located off of Route 20 in the center of town, behind the Town Hall and is classified as a Community water supply. The facility contains three separate apartment buildings, an office building, a maintenance garage with a cement floor and a community center. The single water supply well (Well #1) for the Housing Authority is within an underground vault located in the lawn east of the main building, approximately twenty-five feet south of the paved parking area. The water withdrawal is not metered at the Housing Authority and a pumping test has not been conducted to determine the safe yield of the aquifer and well. Therefore, the water usage was estimated to be approximately 8,550 gallons per

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

day, utilizing Title 5 septic system design flow criteria of 150 gallons per day, per unit. Based on that estimated water usage, the Zone I radius for Well #1 is 240 feet and the radius for the Interim Wellhead Protection Area (IWPA) is 590 feet.

Well #1 has a 6-inch diameter steel well casing set into the bedrock and an open rock boring to the bottom of the well, approximately 467 feet deep. No further details about the well construction are known. The well, the storage tank, the motor controls and the distribution pumps are all located within a locked, underground vault with a cement floor. Although it is unknown if a grout sanitary seal was emplaced around the well during construction, the cement floor of the vault is intact and provides some protection from potential contaminants traveling along the casing.

Geological mapping of the area indicates the metamorphic bedrock aquifer that the well taps is quartzofeldspathic gneiss and sillimanite schist from the Hamilton Reservoir Formation of the Brimfield Group. Stratified drift deposits (sand and gravel) of undetermined thickness overlay the bedrock in this area. During the site visit, some shallow, sand and gravel residential and public supply wells were observed in the vicinity of the Housing Authority. Although the actual depth to bedrock is not known, anecdotal information indicates the sand and gravel over the bedrock is greater than 20 feet in thickness.

Although there is some sand and gravel (approximately 20 feet) material overlying the bedrock aquifer utilized by the Housing Authority, the sand and gravel is highly porous. Sand and gravel does not provide a significant hydrogeologic barrier to prevent contaminant migration from the ground surface into the bedrock aquifer. Bedrock wells drilled in these conditions are assigned a high vulnerability to contamination due to the absence of a hydrogeologic barrier.

### The Water Quality

The water quality from the Brimfield Housing Authority water supply Well #1, currently does not require treatment and meets all US Environmental Protection Agency (EPA) and MA DEP drinking water quality standards. On three occasions, in 1997 and 1998, very low concentrations of Volatile Organic Compounds (VOCs) were reported in a sample from the Housing Authority's water supply. Two neighboring properties, the elementary school and the fire station have also reported very low concentrations of VOCs in their water supplies. In all cases, the reported concentrations were well below the Maximum Contaminant Levels as established by the EPA and the MA DEP. The source(s) of these compounds has not been identified.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Housing Authority	Below Grade Transformers	Yes	Yes	Moderate	Oil/Potentially PCBs – Contact utility to determine
	Storage, use, and handling of hazardous materials	Yes	Yes	High	Maintenance equipment, petroleum products, generator and fertilizer
	Parking lot, driveways & roads	Yes	Yes	Moderate	Continue use of salt alternatives
	Storm drains	Yes	Yes	Low	Roof drain in Zone I; stormwater drains in IWPA
	Septic system: lines, tank and field	Yes	Yes	Moderate	The tank is in Zone I; the leachfield is in the IWPA. See septic systems brochure
USTs	Petroleum products (USTs), Two Tier IC confirmed gasoline release sites	No	No	High	Known gasoline/heating oil storage. Two release sites. No confirmed impact on the Housing Authority well water quality

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

However, there are two confirmed hazardous materials release sites (two gasoline stations on Route 20) in the vicinity of the Housing Authority that are being cleanup and/or monitored. Table 2 also identifies other activities near the Housing Authority's well. Due to these factors, the Housing Authority is required to continue monitoring for VOCs annually. No VOCs were reported in the samples collected in 1999 and 2000. For current monitoring results, please refer to the Housing Authority's most recent Consumer Confidence Report (CCR) or call Virginia Butler, the Public Water System contact person listed above.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas and within close proximity to the Housing Authority that are potential sources of contamination. Please refer to Table 2.

Key issues include:

1. Non-water related activities within Zone I;
2. Below Grade Transformers;
3. Storage, use, and handling of hazardous materials;
4. Parking lot, driveways & roads;
5. Septic System;
6. Storm drains;
7. Underground Storage Tanks (USTs) for petroleum products at two gasoline stations (confirmed, hazardous materials release sites), school and fire station/DPW garage.

One high and three moderate threat activities are located within the Zone I and IWPA. In addition, two confirmed release sites and two other UST facilities are located within proximity of the Housing Authority. Based on these activities and the historical water quality issues, the overall ranking of susceptibility to contamination for the Housing Authority well is high.

1. Activities within Zone I - Currently, the well does not meet DEP's land use restriction that allows only water supply related activities and buildings in the Zone I. The Zone I for Well #1 contains almost all activities related to the facility including apartment

buildings, parking areas and maintenance storage garage. Please note, systems that do not meet DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any other new activities within the Zone I.

2. Below Grade Transformers – All electrical transformers contain oil and depending on the age of the transformer, the oil may contain PCBs. The three transformers at the Housing Authority are recessed below grade in open bottom pits. If one of the transformers were to rupture, the oil would be released to the soils and could potentially impact water quality in the well. Upon request, the electrical utilities change the oil in transformers that contain PCBs and may convert the below grade transformers to above grade systems.

3. Storage, use, and handling of hazardous materials – The maintenance garage is located within the Zone I of the well. The garage was tidy with no evidence of significant amounts of materials storage or spills. Although the garage has a cement floor and there are no floor drains, the materials kept within the

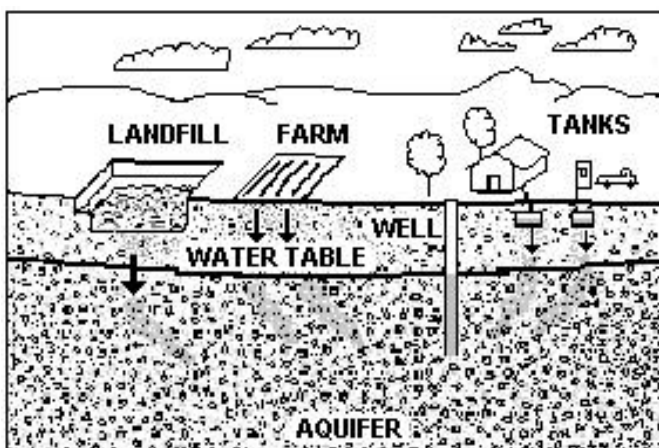


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- ◆ Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- ◆ MA DEP SWAP Strategy
- ◆ Land Use Pollution Potential Matrix
- ◆ Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

garage (gasoline power generator, lawn mower, small amounts of petroleum products and fertilizer) pose a potential treat to the well due to proximity and the potential for accidental release. It is recommended that an alternative storage facility, away from the Zone I be considered. Until an alternative storage site is available, secondary containment and proper management of these materials is important.

4. Parking area, driveway and roads - The parking area is within 25 feet of the well vault and the drive and roadways are within 31 feet of the vault. All of the areas are paved with storm drains that discharge to a single outfall located approximately 180 feet south of the well

5. Septic System – Some components of the Housing Authority's septic system, such as sewer lines and tank are within the Zone I. The leachfield is in the IWPA approximately 250 feet from the well. The Housing Authority maintains the septic system through regular pumping and the tenants are informed regarding proper disposal practices. There is no sewer in Brimfield.

6. Storm drain - .One drywell for roof runoff is located approximately 110 feet south of the well. As previously noted in item 4, parking lot storm drains discharge within the Zone I to a single outfall located approximately 180 feet south, topographically down gradient, of the well

7. USTs - Although none of the USTs are within the IWPA, there are currently four known UST locations within close proximity to the Housing Authority. Two gasoline stations along Route 20, on the corner of Route 19 are confirmed (Tier 1C) gasoline release sites. Both site owners are cleaning up the sites and monitoring private wells and the groundwater quality in the vicinity of their facilities. The Brimfield Elementary School has a relatively new 10,000-gallon UST east of the building just south of the Housing Authority. The Brimfield Fire Station has a new gasoline UST just south of the station and the school. Both the school and fire station USTs have monitoring systems to detect leaks.

## 3. PROTECTION RECOMMENDATIONS

The Brimfield Housing Authority along with its certified operator should review and adopt the following recommendations, some of which may require contact with and cooperation of the Brimfield Town government: Implementing these recommendations will reduce the system's susceptibility to contamination.

### Zone I and IWPA:

3 Remove all potentially hazardous materials (gasoline, petroleum products and fertilizers) from the Zone I. The Housing Authority is eligible and should consider applying for a Wellhead Protection Grant to construct a storage shed outside of the Zone I. Until that time, use containment and caution when using and storing these products.

- 3 Keep all new non-water supply activities out of the Zone I.
- 3 Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- 3 Conduct regular inspections of the Zone I and IWPA. Look for illegal dumping, evidence of vandalism and other activities on and off of your property that may pose a potential threat to your water supply.
- 3 Consider upgrading the current gasoline powered backup generator to a propane or natural gas back-up power source in the future. This is also an eligible grant project.

### Training and Education:

- 3 Continue educating tenants with respect to using cleaning compounds that are safe for the septic system and regarding proper disposal practices, i.e. only sanitary waste in the septic system.

- 3 Post drinking water protection area signs at key visibility locations.

**Facilities Management:**

- 3 Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/brp/dws/dwspubs.html](http://www.state.ma.us/dep/brp/dws/dwspubs.html).
- 3 Upgrade all existing oil/hazardous material storage areas to incorporate secondary containment and safety practices.
- 3 Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on Housing Authority property. Minimize or eliminate fertilizers within Zone I. See Pesticide Fact Sheet.
- 3 Continue the good practice of inspecting and maintaining septic system components on a regular basis. Refer to the appendices for more information regarding septic systems.
- 3 Contact the utility again regarding the below grade transformers. One request has already been made to the utility. Request that the utility make a determination if PCBs are present in the transformers and inquire about upgrading the transformers to above grade units with cement pads. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- 3 Work with local officials in Brimfield to include the Housing Authority IWPA in an Aquifer Protection District with protective bylaws to assist you and other PWSs in improving protection. The DEP can assist the community in developing bylaws.
- 3 Prepare a Wellhead Protection Plan and Emergency Response/Contingency Plan to address short-term water shortages/emergencies and long-term water demands. As an example, keep the phone number of a bottled water company readily available.
- 3 Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**Attachment:**

Map of the Public Water Supply (PWS) Protection Area.

Pesticide Fact Sheet

Septic System Fact Sheet

Sample SWAP language for your CCR

W:\brp\ws\swapdocs\correspondence\1043002

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
WOODBINE COUNTRY STORE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 13, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Woodbine Country Store
<i>PWS Address</i>	Main St
<i>City/Town</i>	Brimfield, Massachusetts
<i>PWS ID Number</i>	1043008

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1043008-01G	131	436	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

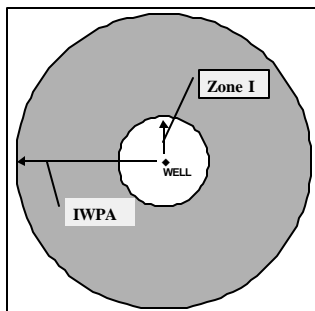
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #  
1 (1043008-01G)**

Zone I = 131 ft.  
IWPA = 436 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as fuel oil and underground storage of gasoline within the IWPA. Other moderate threats include local roads and parking areas within the Zone I and the IWPA. In addition, there is a facility identified as a Confirmed Hazardous Materials Release Site within the IWPA. Contact the Bureau of Waste Site Cleanup for additional information about the site at 413-784-1100.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection

## Source Water Assessment Program (SWAP) Report

### for Brimfield Elementary School

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 31, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Brimfield Elementary School</b>
<i>PWS Address</i>	<b>22 Wales Road</b>
<i>City/Town</i>	<b>Brimfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1043014</b>
<i>Local Contact</i>	<b>Mr. Peter Silverman</b>
<i>Phone Number</i>	<b>413-245-7337</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone 1 (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1043014-02G	250	736	High

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

#### Description of the Water System

The Brimfield Elementary School (the school) is located in the central portion of Brimfield just south of the Town center on Route 19. The school student and staff population is approximately 415 people per day and the school is served by one potable supply well (Well #2-02G). Well #1 is severed from the distribution system but the school maintains Well #1 as an emergency source. The emergency source will not be further addressed in this report. Well #2 was installed to replace Well #1 in 1992 as part of a school expansion and upgrade project. The well is located southwest of the school on the edge of the ball field. There is no municipal wastewater sewer system in

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Brimfield; therefore, the school and surrounding facilities are served by on-site septic disposal.

Well #1 is an 8-inch diameter, bedrock well that is 466 feet deep. Geologic mapping in the area and the well log indicates overburden deposits of 124 feet of sand with some till over the bedrock. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers about 14,000 to 18,000 years ago.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The Zone I and IWPA protective area radii are 250 and 736 feet, respectively. These protective radii were calculated based on the approved withdrawal rate of the well which was based on a 48-hour pumping test conducted during the New Source Approval Process. Please refer to the attached map that shows the Zone I and IWPA.

The Zone I area for the well is conforming to current DEP requirements. The Zone I area for Well #2 includes the playing fields for the school. DEP approved the activity provide no pesticides and fertilizers are used on the fields. The leachfield is located just outside Zone I. All of the school building and facilities, two USTs, three leachfields, the fire station, the DPW Highway garage and part of the Brimfield Housing Authority facilities are also located within the IWPA.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments/threats
USTs (1 gasoline, 1 fuel oil)	No	Yes	High	UST w/leak detection at school and fire station
Floor Drains in Boiler Rooms	No	Yes	Moderate	Consult with UIC program regarding compliance
Athletic fields	Yes	Yes	Moderate	Continue current practice of prohibiting the use of pesticides/fertilizers on fields
School facilities and parking	No	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
High density residential housing	No	Yes	Moderate	Septic systems, household hazardous materials and parking
Transportation Corridor	No	Yes	Moderate	Wales Road (Rt. 19)
Fire Station	No	Yes	Moderate	Vehicle washing and vehicle storage
Septic systems components	No	Yes	Moderate	School housing authority and DPW leachfields in the IWPA
Highway Department - VSQG	No	Yes	Moderate	Hazardous materials storage and use and recycling center

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Geological mapping of the area indicates the metamorphic bedrock aquifer that the well taps is quartzofeldspathic gneiss and sillimanite schist from the Hamilton Reservoir Formation of the Brimfield Group. Stratified drift deposits (sand and gravel) of undetermined thickness overlay the bedrock in this area. During the site visit, some shallow, sand and gravel residential and public supply wells were observed in the vicinity of the school. Although the actual depth to bedrock is not known, anecdotal information indicates the sand and gravel over the bedrock is greater than 20 feet in thickness.

Although there is some sand and gravel (approximately 124 feet) material overlying the bedrock aquifer utilized by the school, the sand and gravel is highly porous. Sand and gravel does not provide a significant hydrogeologic barrier to prevent contaminant migration from the ground surface into the bedrock aquifer. There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information. Please note that the land use descriptions are limited and the school area is described as Urban Open space for lack of a better descriptor.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Zone I**
2. **Floor drains in boiler rooms,**
3. **School facilities and athletic fields,**
4. **Residential housing,**
5. **Transportation corridors and right of ways,**
6. **Underground Storage Tanks**
7. **Hazardous materials/waste**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate based on several high threat activities within the protection areas. Please refer to Table 2.

1. **Zone I** – The water supplier does own the entire Zone I area. The Zone I includes a ball field.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for maintenance and access to the area.
- ✓ Do not use or store pesticides or fertilizers within the

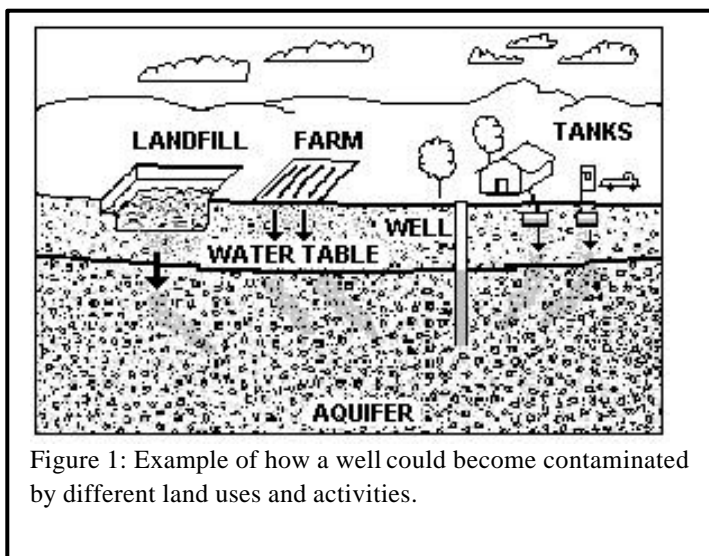


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### Zone I.

**2. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

#### Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**3. School facilities and athletic fields** – Elementary schools generally use only household type hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the Zone I or IWPA of the wells. Potential exists for contamination of the well by onsite use of fertilizers and/or pesticides; continue to prohibit their use in Zone I. Storm drains in the parking areas at the school drain directly into the ground.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**4. Residential Land Use** – There is high-density residential housing at the Brimfield Housing Authority within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**5. Transportation corridors and parking** - Roads and parking areas are potential sources of contamination due to deicing of roadways and leaks or spills of fuels and other hazardous materials during accidents.

**Recommendation:**

- V Contact the local fire department to ensure that the Zone I and IWPA areas are included in Emergency Response Planning.

**6. Underground Storage Tank (UST)** – The school has a 10,000-gallon double-walled, UST with fuel oil and the Fire Department has an UST with gasoline; both are located within the IWPA of the water supply. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store. Both tanks are relatively new and have leak detection.

**Recommendation:**

- V Any modifications to the UST must be accomplished in a manner consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs. Monitor all activities associated with the products especially during delivery.

**7. Hazardous Materials Storage and Use** – The Brimfield Highway Department, Fire Department and recycling facilities are located within the IWPA. The Highway Department is a registered hazardous waste (oil) generator. There were no floor drains observed during the assessment and the hazardous materials appeared to be handled appropriately. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. In addition, there are vehicles stored on site. There is also a well that serves the facility northwest of the garage and it’s cap was loose at the time of the assessment. The cap on the well should be inspected and changed to a watertight cap with a sanitary seal.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Review the attached fact sheet for additional information about vehicle washing activities.
- V Continue to manage any vehicles that are stored on site to ensure there is no leakage of petroleum products.
- V Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- ✓ Request that the Town departments monitor their well and continue to use BMPs for management of hazardous materials in the protection areas.

**Zone I and IWPA:**

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Continue to conduct regular inspections of the Zone I and IWPA.
- ✓ Monitor activities and if there is evidence of increased activity or access to the well, consider limiting access with a fence. Inspect the cap to ensure the integrity of the seal.
- ✓ Post drinking water supply signs in key locations such as along the access road and in the parking areas but away from the wells themselves.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

**Training and Education:**

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.

**Facilities Management:**

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and the certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.

**Planning:**

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- ✓ Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain
- Very Small Quantity Generator (VSQG) information



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Medsource Technologies

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
November 7, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	<b>Medsource Technologies</b>
<i>PWS Address</i>	<b>69 Mill Lane</b>
<i>City/Town</i>	<b>Brimfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1043025</b>
<i>Local Contact</i>	<b>Mr. Joseph Landry</b>
<i>Phone Number</i>	<b>413-245-7144</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1043025-01G	175	471	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Medsource Technologies is located in Brimfield, a small, rural community in south central, Massachusetts. The facility manufactures orthopedic devices and surgical instruments. Brimfield does not have public water or municipal wastewater sewers available. Therefore, the facility is served by an on-site water supply and septic disposal. The facility is a registered small quantity hazardous waste generator (SQG).

The total staff is approximately 85 people per day and is served by a single potable

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

supply well (01G) located at the facility. The well is located within an older building at the facility and is a 6-inch diameter, bedrock well that is approximately 380 feet deep.

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 175 feet and 471 feet, respectively, based on one year of metered water use. Review of currently available data indicates that normal water use may, at times may be greater than that used for the initial Zone I determination.

The overburden in the area is mapped as a relatively thin layer (0 to 50 feet thick) of sand and gravel (stratified drift) covering glacial till and bedrock. The overburden was likely deposited during the recession (melting) of the glaciers some 14,000 to 18,000 years ago. The bedrock in the area is mapped as a sulfidic schist of the Partridge Formation. There is no evidence of protective barrier of either thick till or of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is not treated prior to distribution at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #1 includes the entire facility including the septic system, chemical storage and use, fuel storage (AST), the road, the parking area and residences.

#### Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential/commercial land uses with on-site septic disposal**
3. **Transportation corridors,**
4. **Hazardous materials storage and use.**

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	--	--	--	Non-conforming uses in Zone I
Hazardous materials storage and use	Yes	Yes	High	Continue the use of BMPs and coordinate with emergency responders.
SQG	Yes	Yes	Low	Hazardous materials/SQG
Septic system	No	Yes	Moderate	Microbial threat and potential improper disposal of hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor and parking	No	Yes	Moderate	Limit road deicing materials and monitor parking areas.
Transformer (ground mounted)	Yes	Yes	Low	Although most transformers today do not contain PCBs the oils may pose a threat due to the proximity to the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for Medsource water system is high, based on the presence of at least one high threat ranked land use or activity in the Zone I and IWPA. However, Medsource is commended for their diligent management of hazardous materials on-site. Please refer to Table 2 for more details.

**1. Non-conforming activities within Zone I** – Currently, the water supplier does own the entire Zone I area, however, the activities conducted within the Zone I are non-conforming and pose a threat to the water supply. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I activities prior to increasing water use or modifying systems. The well is located within one of the facility's buildings. Medsource is a registered Small Quantity Hazardous Waste Generator, and heats with fuel oil utilizing one aboveground storage tank (AST) that is located outside of the building. There were no floor drains observed. The parking area is paved and utilizes drywells.

#### Recommendations:

- V Consider relocation of the well if potential threats cannot be mitigated and water quality is impacted by activities.
- V To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- V Where it is feasible, remove all hazardous materials from the Zone I. Continue current good housekeeping practices and the use of BMPs for the storage, use, and disposal of hazardous materials.
- V Continue to carefully monitor the delivery, handling and storage of chemicals and products.
- V Inspect the well casing and cap regularly to ensure it is sanitary and watertight.

**2. Residential Land Uses** – The IWPA for Well #1 has low-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks,

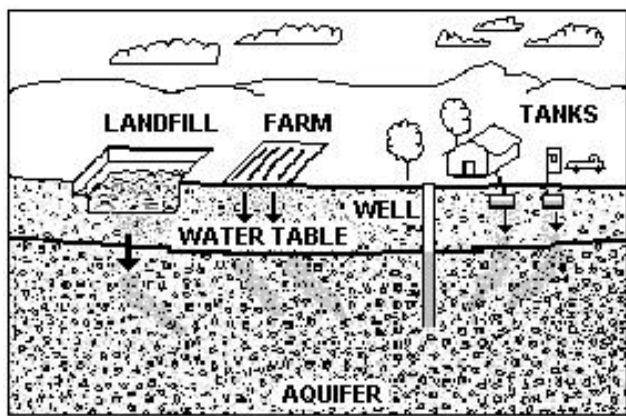


Figure 1: Example of how a well could become contaminated by different land uses and activities.

maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm> for additional information.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Consider distributing the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor** – Local roads and part of State Route 19 is located within the IWPA and the access and parking areas for the facility are within Zone I as well. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and

contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. The facility is served by direct recharge of stormwater to the overburden aquifer through drywells.

#### **Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- ✓ Monitor the parking area for spills especially during deliveries.

**4. Hazardous Materials Storage and Use** – Medsource utilizes hazardous materials and generates hazardous waste. There were no floor drains observed during the assessment and the hazardous materials appeared to be handled appropriately. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Continue current management of hazardous materials on-site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- ✓ Contact the Bureau of Waste Prevention (John Downes – 413-755-2231) if you have any question regarding disposal of hazardous materials.
- ✓ Aboveground storage tanks should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.
- ✓ Monitor deliveries of oil and consider sleeving the lines to prevent accidental release.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

#### **Priority Recommendations:**

- ✓ Consider relocation of the well if potential threats cannot be mitigated.
- ✓ Continue current use of BMPs and management practices.

#### **Zone I:**

- ✓ Prohibit any new non-water supply activities from the Zone I.

### **For More Information:**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Continue to monitor use and handling of hazardous materials.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

### **Planning:**

- ✓ Work with local officials in Brimfield to develop an Aquifer Protection District and Bylaws for compliance with 310 CMR 22.000 to include Medsource and other IWPA's in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets
- List of Regulated facilities in the protection areas

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Medsource Technologies (formerly Brimfield Precision)	Mill Lane Road	Brimfield	Hazardous Waste Generator	SQG	Manufacturing facility

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
CUMBERLAND FARMS



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Cumberland Farms
<i>PWS Address</i>	3 Main St
<i>City/Town</i>	Brimfield, Massachusetts
<i>PWS ID Number</i>	1043026

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1043026-01G	100	411	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

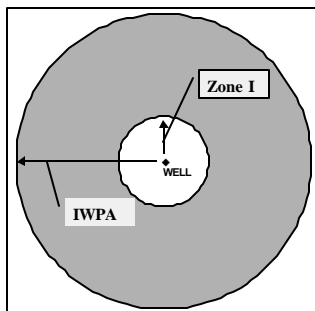
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1043026-01G)**

Zone I = 100 ft.  
IWPA = 411 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as gasoline and floordrains other than those connected to a sewer line within the Zone I and the IWPA. Other moderate threats include local roads and parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, Bureau of Waste Site Clean-up files, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site <http://www.dep.state.nh.us/dw/>

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Mohawk Trail Regional High School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
January 8, 2004

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Mohawk Trail Regional High School</b>
<i>PWS Address</i>	<b>Ashfield Road</b>
<i>City/Town</i>	<b>Buckland, Massachusetts</b>
<i>PWS ID Number</i>	<b>1047000</b>
<i>Local Contact</i>	<b>Mr. Douglas Mollison</b>
<i>Phone Number</i>	<b>413-625-0192 x42</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1047000-01G	251	626	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Mohawk Trail Regional High School (the school) is located in the northeast corner of Buckland, Massachusetts. Buckland is a small, rural agricultural town in northwestern Massachusetts on the eastern slope of the Berkshire foothills. The facility consists of various building wings located adjacent to each other serving the region's seventh through twelfth grade students and the regional school system administration building. The total school system student and staff population is approximately 900 people per day. There is no municipal water system in the vicinity of the school, therefore water is supplied to the school through a single, on-site well. However, since 1998, the wastewater from the school is discharge through a sewer to the municipal wastewater treatment facility.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Well #1 (01G) is located approximately 75 feet west of the school within a brick and cement block structure that extends approximately three feet below and three feet above grade and is secured with a bulkhead door. The well casing terminates below grade, but about two feet above the floor of the pit. Well #1 is a nominal 8-inch diameter, 400-foot deep bedrock well with approximately 135 feet of casing set into sound rock and an approved withdrawal rate of approximately 7 gallons per minute.

The Zone I protection area for a well is the area immediately around the well where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. In the mid-1990s, the school was reconstructed and expanded. Due to site constraints, the facility was allowed to expand and utilize the existing well following testing under the New Source Approval Process and providing upgrades to the facility to enhance protection of the source. The school well has a Zone I protective radius of 251 feet and an IWPA protective radius of 626 feet based on an approved withdrawal rate of 7 gallons per minute (10,159 gallons per day). Although the well is approved for approximately 10,159 gpd, actual usage is less than 6,000 gallons per day. Please refer to the attached map that shows the Zone I and IWPA. Although much of the school facility is within the Zone I, the school converted to propane for fuel, removed a gasoline storage tank, connected to the municipal sewer and located the main parking areas outside of the Zone I.

The school is located in the Deerfield River valley north of Route 112 and south of the river. Geologic mapping indicates sand and gravel deposits between 50 and 100 feet deep, however, information from the school indicates 135 feet of casing in the well. The sand and gravel deposits in the river valley are stratified drift deposited during the

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to conducting any work in the Zone I or expanding the system/facility.
Transportation corridor/parking	Yes	Yes	Moderate	Limit road-deicing usage, monitor parking areas and control stormwater.
Athletic fields	Yes	Yes	Moderate	Prohibit the use of pesticides/fertilizers on school fields in Zone Is. Utilize an IPM for athletic fields.
School (Middle and High Schools)	Yes	Yes	Moderate	Use BMPs for hazardous materials.
Hazardous materials (VSQG)	Yes	Yes	Moderate	Use BMPs for maintenance hazardous materials and laboratory materials.
Transformers	Yes	Yes	Low	Monitor transformers for potential leaks

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

recession of the glaciers some 18,000 years ago. Recent rivers have reworked the stratified drift and deposited additional alluvium in the valley. The bedrock geology in this area is a complex. The bedrock in the immediate area of the school is mapped as granite biotite gneiss, Collinsville Formation, part of the Shelburne Falls Dome.

There is no evidence of a continuous, protective confining layer such as thick clay or till in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water from the wells is not treated prior to distribution. Water suppliers are required to regularly monitor the quality of the water. You may request additional information regarding the current water quality from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **School facilities and athletic fields;**
3. **Transportation corridors/parking; and**
4. **Hazardous materials.**

There are several activities within the Zone Is and IWPAs that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate based on at least one moderate threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – Although the water supplier does own or have control of the entire Zone I area through a Conservation Restriction, there are numerous activities within the Zone I that are non-conforming. The entire school facility is within the Zone I of the well. Systems not meeting DEP Zone I requirements for ownership or control or

non-conforming activities within Zone I must receive DEP approval and address Zone I issues prior to increasing water use or modifying systems/facilities.

### Zone I Recommendations:

- ✓ Prohibit any new non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides or fertilizers in Zone I.
- ✓ Inspect the well regularly to ensure the cap is secure, there is no standing water near the well and to ensure that the bulkhead is secure.
- ✓ Relocate the well if it cannot be secured or if water quality is impaired by activities near the wells.
- ✓ Monitor all activities associated with petroleum products within the Zone Is.

**2. School facilities and athletic fields** – All of the school's facilities are located within the Zone I and/or IWPA of the wells. Middle schools generally use only

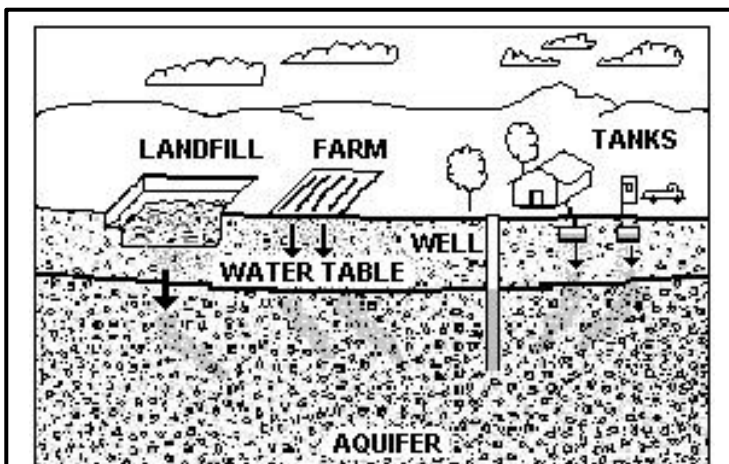


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

household type hazardous materials. Although high school laboratory and photo labs can use potentially harmful materials, the potential threat from disposal of these materials is somewhat minimized because the school is connected to the municipal sewer. All of the floor drains and laboratory facilities discharge their wastewater through the sewer. The school is presently registered as an inactive hazardous waste generator and has established procedures in place for the use and management of potentially hazardous materials in the laboratories and studios. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". According to the facilities manager pesticides and fertilizers are not used on the athletic fields.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the Zone I and IWPA.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides or fertilizers within Zone I.
- ✓ Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ For additional information, refer to the Massachusetts Public Health Association's Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**3. Transportation corridor/parking** – The school's internal transportation corridors and parking are located partially within the Zone I and within the IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up deicing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

#### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- ✓ Limit access to the Zone I areas and direct runoff away from the wells.

**4. Hazardous Materials Storage and Use** – The school utilizes hazardous materials for maintenance and in the laboratories and although the school is a registered generator of hazardous waste and waste oil, the status is "inactive". Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal of non-hazardous materials may be through the sewer. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator.

#### Hazardous Materials Storage and Use Recommendations:

- ✓ Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- ✓ Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Ensure that management plans are up to date and staff review BMPs for the handling of hazardous materials.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The DEP commends the school District for upgrading the facilities to protect the water supply well during the renovation and expansion of the school. The Department encourages continued diligence in management of activities near the wells.

Please review and adopt the key recommendations listed above and as follows:

#### **Priority Recommendations:**

- V Inspect the well regularly and ensure the bulkhead is secured to prevent access to the well.

#### **Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA and the well.
- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lab chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, lab chemicals, pesticides and household hazardous waste.
- V Replace the split cap on the well with a pitless adaptor and sanitary cap.

#### **Training and Facilities Management:**

- V Incorporate groundwater education into school curriculum (7-12 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent household chemicals and or lab chemicals. Include custodial staff, groundskeepers, and the certified operator.
- V Manage hazardous materials and waste in accordance with regulation and in a manner protective of the water supplies and public health and safety.

#### **Planning:**

- V Work with local officials to develop an Aquifer Protection District and Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Hawlemont Regional Elementary School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 31, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Hawlemont Regional Elementary School
<b>PWS Address</b>	10 School Street
<b>City/Town</b>	Charlemont, Massachusetts
<b>PWS ID Number</b>	1053007
<b>Local Contact</b>	Mr. Paul Dinicolantonio
<b>Phone Number</b>	413-339-8316

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well No. 1	1053007-01G	134	437	High
Well No. 2	1053007-02G	134	437	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Hawlemont Regional Elementary School is located in the small, rural town of Charlemont, in northwest Massachusetts on the Mohawk Trail (State Route 2). The school has a student and staff population of approximately 210 people. There is no municipal water system in Charlemont but there is a wastewater treatment plant that serves the center of town, including the school. Therefore, the school discharges wastewater to the treatment plant but water is supplied to the school through two on-site wells. Well #1 (01G) is the main water source for the school; Well #2 is physically



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

disconnected from the system but the water quality is regularly monitored and remains a potentially active source. The use of Well #2 was discontinued in 1999 when low concentrations of the volatile organic compounds tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected in water samples collected from Well #2; the compounds were not detected in Well #1. Although the concentrations did not exceed the maximum concentration limits set by DEP and Environmental Protection Agency (EPA), the school does not use the well but continues to monitor the water quality. Although the compounds have not been detected in the water from Well #2 since the Spring of 2000, the school does not use the well. Water quality in both wells is regularly monitored and the school and DEP have an agreement that if the water quality becomes impaired in Well #1, the school will develop an alternative water source.

The school is located south of Route 2 and the Deerfield River bounds the school property on the south. The school is located in the center of town with residences and businesses surrounding the area. Generally, the DEP requires development of a new source that is in compliance with current regulations if a system with a non-conforming source expands. However, due to site constraints and good water quality in the existing Well #1, renovations and an expansion of the school were recently completed, with the school maintaining the use of the existing wells provided the water quality is not impaired. Well #1, the main source is an 8-inch diameter, gravel developed well, screened from 90 to 95 feet below grade that is located in the basement of the building in the boiler room. The school will be installing a berm around the well to prevent inundation of the well if a release occurs in the basement. Well #2 is located within an 8x5x5-feet deep concrete bulkhead, west of the school.

The school is within the Deerfield River valley at the base of the Berkshire foothills between Rice Brook and Mill Brook. The surficial geology at the school site is glacial drift, sand and gravel, deposited within a glacially deepened bedrock valley. Receding glaciers deposited the sand and gravel some 18,000 years ago. In fact there is a delta at the outlet of the Mill Brook as it enters the Deerfield River valley. The deposits within the valley have been reworked by recent streams and rivers with additional recent alluvium deposited by the river. Information from the school indicates sand and gravel to at least 95 feet below grade. However, there is no record of a clay-confining unit in the area. The topography rises dramatically north of the river valley and Route 2. The hillsides north of the school generally have thin till over bedrock. The bedrock at the school is mapped as bands of the Hawley Formation; interbedded amphibolite, greenstone and schist and just east of the school is a mapped contact with a black, fine-

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to expanding the facility or conducting any work in the Zone I.
Fuel oil storage (UST/AST)	Yes	Yes	High/Moderate	Spills, leaks, or improper handling of fuel oil
Transportation corridors and parking	Yes	Yes	Moderate	Be sure emergency responders are aware of the location of your wells.
Residential land uses	Yes	Yes	Moderate	Nitrates, microbial contaminants, and improper disposal of hazardous chemicals
School	Yes	Yes	Moderate	Continue policy of not using pesticides and fertilizers
Commercial/Institution uses	Yes	Yes	Moderate	Household/commercial hazardous materials: recommend BMPs

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

grained schist and quartzite interbedded with amphibolite. There is no empirical evidence of a protective clay layer or thick till to prevent activities on the ground surface from threatening the water supplies. In fact, the very low levels of VOCs were detected in water from the bedrock well on site. Therefore, both the bedrock and the sand and gravel aquifers are identified as having high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration.

The Zone I is the area immediately around the well that is considered most vulnerable to contamination. The Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the facility require DEP approval and compliance with Zone I restrictions. As noted, the DEP allowed the school to expand and to continue using the non-conforming Well #1 until such time that the water quality is impacted from activities near the well. The Zone I and IWPA for both wells are the same. The Zone I and IWPA were based on estimated water use from the wells. The Zone I and IWPA radii for both wells are 134 feet and 437 feet, respectively. The school has installed a meter on Well #1 in 2001 and a preliminary review of the data indicates the school actually uses less water than was initially based on Title 5 flow estimates. Upon review of two full years of water metered data following the school renovation project, the DEP may reduce the size of the protection areas based on actual metered use. Please refer to the attached map of the Zone I and IWPA.

The protection areas for the school's wells include many activities that pose a potential risk of contamination. There are also activities that are just outside of the protection areas that may pose a significant threat to the wells if not managed. All of the school facilities, including an underground fuel oil storage tank, are located within the Zone I or IWPA of one of the wells. As noted previously, the school discharges all of its wastewater to the municipal sewer. If funding becomes available, the school may wish to consider delineating the Zone II recharge area for Well #2 so that the protection strategy for the well can be more focused and perhaps identify a potential location for a new source if one is required in the future.

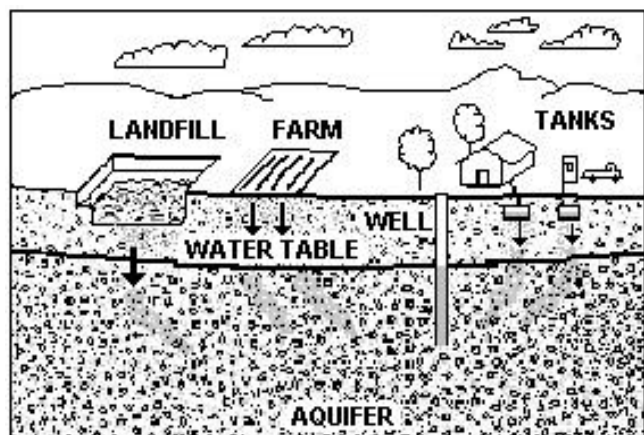


Figure 1: Example of how a well could become contaminated by different land uses and activities.

The well serving the school has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web EPA's at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), for Envirofacts.

## 2. Discussion of Land Uses in the Protection Areas

There are numerous land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### Key issues include:

1. **Non-conforming Zone Is;**
2. **Elementary School;**
3. **Fuel storage tanks (UST/AST);**
4. **Commercial businesses;**
5. **Transportation and parking; and**
6. **Residential.**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the wells do not meet DEP's restrictions, which require the system to own or control the entire Zone I area and allow only water supply related or other non-threatening activities in Zone I. The school's Zone Is include all school facilities including a fuel oil underground storage tank (01G). The tank was relocated as part of the renovation and is a new tank with leak detection. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying the system's facilities.

### Recommendations:

- ✓ Do not allow any new non-water supply activities in the Zone I.
- ✓ Monitor and control all activities near both wells.
- ✓ Monitor all fuel deliveries.

**2. School facilities and athletic fields** – Elementary schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the wells. However, municipal sewer serves the facility.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use fertilizers and pesticides in the Zone Is.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website for additional information, online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**3. Fuel Oil Storage – Underground/Aboveground Storage Tank (UST/AST)** – Although the UST fuel oil tank is new the UST can pose a potential threat to the water supply because of potential leaks and/or releases especially during delivery. If managed improperly, underground storage tanks and the associated fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store. The school also has a propane AST which does not pose as significant a threat as the fuel oil UST. In addition, there are commercial and residential facilities that are within close proximity to the school that use various types of fuel for heating including oil, propane, kerosene or wood.

### Recommendations:

- ✓ Any modifications to the UST/AST must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

- ✓ Monitor deliveries of oil as many spills are related to delivery.
- ✓ Be sure that the floor drains are running freely and are connected to the municipal wastewater treatment facility.
- ✓ Containment of the fuel system to prevent accidental releases to the floor is important. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require that your boiler maintenance contractor use containment, protect the well and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor to adequately protect the well.

**3. Residential Land Uses** – There is an apartment complex immediately adjacent to the school and there is at least one other apartment building and approximately twelve other residences within the protection areas of the wells. It is assumed that all are connected to the municipal sewer. However, it is unknown what fuel sources the surrounding residences utilize. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” attached to this report and on-line at the following DEP website which provides BMPs for common residential issues: [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm).
- ✓ Promote BMPs for stormwater management and pollution controls.

**4. Transportation corridor/parking** – Mohawk Trail (State Route 2), residential, commercial and facility parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

**Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- ✓ Continue to manage on-site and off-site stormwater to ensure it flows away from the wells.

**5. Commercial facilities** - There are commercial/institutional facilities located within the IWPA of the school wells. The facilities include restaurants, a church, a general store and a hardware store. The town’s Fire Department is also on the edge of the IWPA for Well #1. Some businesses use or store hazardous materials or generate hazardous waste. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground.

**Recommendations:**

- ✓ Inform the businesses that your PWS is nearby and offer information regarding the use of BMPs at their facilities.

Implementing the following recommendations will reduce the system’s susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells’ susceptibility to

contamination. The school is commended for not using pesticides and fertilizers on its athletic fields and for continuing to monitor the quality of the water in Well #1. The water supplier should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- ✓ Monitor fuel oil delivery and activities within close proximity to the wells. Do not use or store hazardous materials in the vicinity of the wells.

**Zone I:**

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Post the area with “Public Drinking Water Supply Recharge Area” signs at appropriate locations away from the actual wells.
- ✓ Consider well relocation if Zone I threats cannot be mitigated or if water quality is impacted by activities. Consider delineating the Zone II for the existing well and utilizing that information to potentially site a new well if it is needed for the future.

**Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into the school curriculum and community.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

**Facilities Management:**

- ✓ If it is feasible in the future, consider upgrading the heating system to propane for the purpose of removing fuel oil storage from the school.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Keep the area near transformers free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to develop an Aquifer Protection District with bylaws and include the facility’s IWPA in the District, along with other public water supply wells in town and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓ The school may wish to consider delineating the Zone II for the sand and gravel Well #1. This would allow for a more focused protection plan and may result in identifying an alternative site that may be protected for a new well should it become necessary in the future.

**Funding:**

The Department’s Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the “Wellhead Protection Grant Program”. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Woodland Park

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 15, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Woodland Park
<i>PWS Address</i>	Zoar Road
<i>City/Town</i>	Charlemont, Massachusetts
<i>PWS ID Number</i>	1053030
<i>Local Contact</i>	Elizabeth Paulsen
<i>Phone Number</i>	(413) 339-4083

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well No. 1	1053030-01G	235	578	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Woodland Park is a mobile home park located in the town of Charlemont in the Berkshire foothills of northwestern Massachusetts. The park community has 25 homes and is served by a single water supply well located north of Zoar Road. The well is a 200-foot deep well presumed to be in bedrock with a 6-inch diameter casing. Charlemont does have a municipal wastewater treatment plant, but it does not serve this area of town. Therefore, the community is served by on-site septic disposal systems.

The Zone I is the area immediately around the well where only activities associated with



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I radius of 235 feet and an Interim Wellhead Protection Area radius of 578 feet.

Geologic mapping has the area immediately in the vicinity of the well designated as a potentially productive sand and gravel aquifer. The facility is located along the Deerfield River valley that is a deepened bedrock valley that is filled with sand and gravel that was likely deposited during the recession (melting) of glaciers some 14,000 to 18,000 years ago. Over time, the river reworked the deposits and recent alluvium is also present. Mapping indicates sand and gravel deposits of 50 to 100 feet in the immediate vicinity of the well and 0 to 50 feet in thickness immediately northwest of the facility where scarring from a previous sand and gravel-mining operation is apparent. Bedrock rises steeply to the north of the well to Coon Hill and Blueberry Peak usually indicative of thin overburden. Bedrock outcrops are mapped just northwest of the facility on Zoar Road. The bedrock is mapped as the Moretown Formation, a schist and amphibolite of the Rowe–Hawley Zone.

The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveways/road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	Yes	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn care/gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Railroad Tracks	No	Yes	High	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and,**
3. **Railroad Tracks.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities or other non-threatening activities in Zone Is. The facility's Zone I contains driveways, roads, and residences. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Work with residents within Zone I to encourage the replacement of fuel oil or kerosene heat with propane heat and to properly remove the fuel oil/kerosene tanks from the residence if they do convert to an alternative heating source.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway drainage in the Zone I away from the well.
- ✓ If possible relocate septic systems outside of the Zone I.

2. **Residential Land Uses** - The residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and at the DEP drinking water program website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. **Railroad tracks** - Railroad tracks cross the southern portion of the IWPA. Over-application or improper handling of herbicides on the railroad property or right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train maintenance

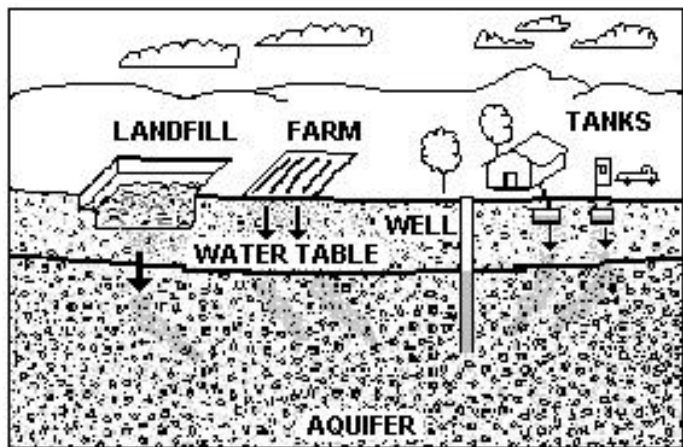


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

chemicals are also potential sources of contamination to the water supply.

### Recommendations:

- ✓ Work with local officials during their review of the railroad right-of-way Yearly Operating Plans to ensure that the portion of right-of-way within the Woodland Park IWPA is not sprayed with herbicides.
- ✓ Work with your local fire department to ensure that the IWPA is included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Woodland Park is commended for having a securely locked cover over the well and diligent observance of activities on-site. Woodland Park should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Encourage the replacement of fuel oil or kerosene heat with propane heat so that oil/kerosene tanks can be removed from the Zone I.
- ✓ If possible, relocate septic systems outside of the Zone I.

### Zone I:

- ✓ Aboveground storage tanks that cannot be removed from your Zone I should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I, check any aboveground tanks for leaks.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Buried fuel lines should be sleeved to help prevent leaks.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on Woodland Park property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to develop an Aquifer Protection District and protective bylaws and include the IWPA in the District and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection  
**Source Water Assessment and Protection (SWAP) Report**  
for  
**Cheshire Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Cheshire Water Department
<i><b>PWS Address</b></i>	80 Church Street
<i><b>City/Town</b></i>	Cheshire
<i><b>PWS ID Number</b></i>	1058000
<i><b>Local Contact</b></i>	Wilbur Chase, Operator
<i><b>Phone Number</b></i>	(413) 743-3816

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water directly to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*Zone II #:* 352

*Susceptibility:* High

<i>Well Names</i>	<i>Source IDs</i>
Well #1	1058000-02G
Well #2	1058000-03G

Cheshire is a small, rural community in northwestern Massachusetts. The Hoosic River flows through the center of the community of approximately 1,400 residents. Cheshire Water Department maintains two active groundwater supplies (Well #1 and #2). Cheshire Water Department also maintains two emergency, surface water reservoirs (Kitchen and Thunder Brook reservoirs) that are not addressed in this report. The wells are located east of Route 8, north of the center of town. Well #2 was constructed as a mechanical back up well 25 feet from Well #1 and the two wells are pumped alternately to meet the system water needs. Both wells are 12 by 18-inch diameter, gravel packed wells, 51 feet in depth with 10-foot screens and submersible pumps. Water from the wells is pumped to a motor control and chemical feed building where Calciquest (blended orthophosphate/polyphosphate compound) is added to the water to sequester the hardness (calcium and magnesium) in the water.

The wells are located on the edge of a buried valley aquifer and utilize water from an unconfined, sand and gravel aquifer within the Hoosic River valley. The bedrock valley was deepened by advancing glaciers some 18,000 years before present and later filled with sand and gravel (glacial drift) as the glaciers melted. Although there is some evidence of fine grained material in the aquifer, there is no confining (protective) clay layer at the site to prevent potential contaminants from entering the aquifer from the ground surface. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent potential contaminant migration from the surface. The Town of Adams' wells are also located within Cheshire, approximately 6,400 feet north (downgradient) of the wells

Bedrock at the well site is mapped as the Kitchen Brook dolomite, a fine-grained massive dolomite with a quartz and calcite-rich region in the upper section. The dolomite contributes to the hardness of the water in the aquifer. The complex bedrock geology of the lowlands and surrounding uplands is mapped as folded and faulted schists, quartzites as well as some marbles and dolomites.

The Zone II for these wells was delineated utilizing conceptual, geological and analytical modeling in accordance with the requirements of the New Source Approval Process following an extended duration pumping test. Please refer to the attached map.

## Section 2: Land Uses in the Protection Areas

The Zone I radius for both wells is 400-feet, and is predominantly owned by the Cheshire Water Department although there is a small area coincident with the bike path (Ashuwillatuck Trail) that is owned by the Massachusetts Department of Environmental Management. The trail is used for passive (non-motorized) recreation and transects the Zone I and runs along the eastern edge of the Zone II. Although historically the old rail bed was used by snowmobiles, the DEM



rules do not allow motorized vehicles on the trail.

The Zone II for Cheshire's wells is a mixture of residential, forested and agricultural crop land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

**Key Land Uses and Protection Issues include:**

1. Residential Land Uses
2. Transportation corridors
3. Agricultural activities
4. Hazardous materials storage and use

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 50% of the Zone II consists of residential areas. None of the areas have public sewers; all use septic systems. There is no clear count of how many residential homes utilize oil versus gas or whether the oil tanks are above or below grade. There is at least one private property which has a 2000 gallon underground storage tank (UST). If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) are potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

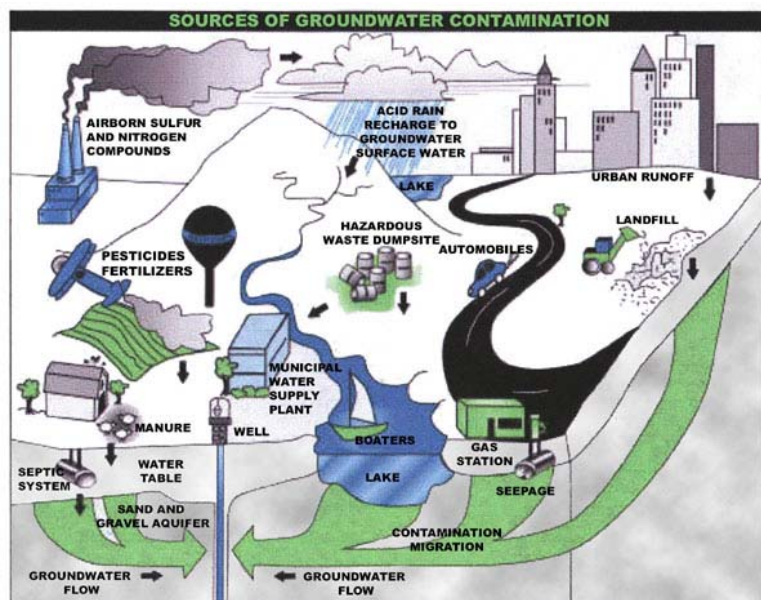
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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“Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

- ✓ Inventory residential fuel sources and encourage residents to remove any underground tanks and contain all other tanks.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**2. Transportation Corridors** - Route 8 runs along the western border of the Zone II, just west of the wells. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. Request a copy of the State Highway Department’s schedule for catch basin cleaning.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**3. Agricultural Activities** – There are several farms with crop lands within the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water sources.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Supply the land owners with maps of the Zone II area.

**4. Hazardous materials storage and use** — Many small businesses, municipalities and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials in UST/AST. These

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**Source Protection Decreases Risk**

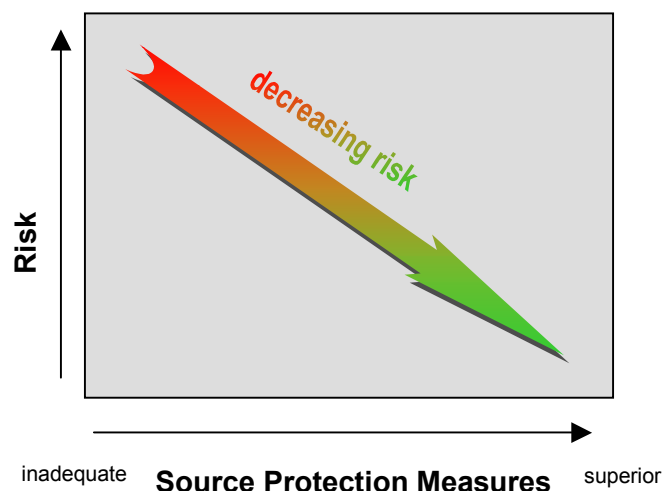


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Crop lands (hay, corn)	57.7 acres	Moderate	Fertilizer and pesticide usage
<b>Commercial</b>			
Gas Stations	1	High	Automotive fluids and fuels: spills, leaks, or improper storage or handling
Service Stations/ Auto Repair Shops	7	High	Automotive fluids and solvents: spills, leaks, or improper storage or handling
Sand and Gravel Operation	2	Moderate	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Chemical Storage	1	High	Chemical wastes: spills, leaks, or improper handling or storage
<b>Residential</b>			
Septic Systems/ Cesspools	Numerous	Moderate	Household hazardous waste: improper disposal and microbial contaminants
<b>Miscellaneous</b>			
Fire Training Facilities/ Fire Station	1	Moderate	Fuels and other chemicals: improper use or storage
Elementary School	1	Moderate	Fuel oil, cleaning and other chemicals; over-application or improper management of fertilizers and pesticides on athletic fields; parking areas; spills, leaks, or improper handling
Underground Storage Tanks	Numerous	High	Stored materials: spills, leaks, or improper handling

Activities	Quantity	Threat*	Potential Source of Contamination
Aboveground Storage Tanks	Numerous	Moderate	Petroleum products and hazardous materials: spills, leaks, or improper handling
Waste Transfer/ Recycling Station	1	Moderate	Water contacting waste materials: improper management, seepage, and runoff
Road and Maintenance Depots (covered salt storage)	1	Moderate	Asphalt materials and other chemicals, gasoline and diesel storage: spills, leaks, or improper handling of deicing materials
Floor Drains in Commercial/Industrial Facilities	Numerous	High	An inspection of the Zone II found several non-complaint floor drains in facilities where hazardous materials were stored.

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity

include a 10,000 gallon UST at the Cheshire School, and a 1000 gallon UST at the First Baptist Church. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information. Encourage the Board of Health to enforce the local floor drain regulation.

Other land uses and activities within the Zone II that pose potential threats include the bike path. Although passive recreation poses minimal threat, the use of motorized vehicles poses a more significant threat. Request that DEM enforce their rules for no motorized vehicle access. Monitor activities and report any violations to the DEM. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. The final report of the findings of an Underground Injection Control Inspection is included as Attachment E of this report to help identify some potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

#### **Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system’s Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Passing wellhead protection bylaws to protect the land areas near the Cheshire Water Department wells.
- Implementing a Public Education program on wellhead protection.
- Working with the board of Health to pass floor drain regulations.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Support the passage of wellhead protection bylaws and floor drain regulations to protect the Zone II for Adams’ wells located in Cheshire.
- ✓ Inspect the Zone I and Zone II regularly.



**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Maintain current signs. Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988 if needed.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring along bike path and non-water supply activities in Zone Is. Request DEM enforce their rules for access.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>YES</b>	The Town "Aquifer Protection District" bylaw meets DEP's wellhead protection requirements. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>YES</b>	Continue to work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	Continue current measures toward maintaining Wellhead Protection; modify plan as necessary.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community. Propose bylaws for Adam's Zone II.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>Partial</b>	For guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Encourage Board of Health to adopt guidelines as a requirement.
Does the PWS provide wellhead protection education?	<b>YES</b>	Continue public education program.



- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Notify Massachusetts Highway Department regarding the location of the Zone II and coordinate with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

#### **Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.

2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection
- E. UIC Report for the town of Cheshire



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Hutchinson Water Company

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 17, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	Hutchinson Water Company
<i><b>PWS Address</b></i>	Hutchinson Road
<i><b>City/Town</b></i>	Cheshire, Massachusetts
<i><b>PWS ID Number</b></i>	1058001
<i><b>Local Contact</b></i>	Mr. Ralph Hutchinson
<i><b>Phone Number</b></i>	(413) 743-5713

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well # 4	1058001-04G	307	933	Moderate
Well # 5	1058001-05G	310	1070	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Hutchinson Water Company serves a small residential community in the Town of Cheshire, Massachusetts, a small town in northern Berkshire County. The Water Company serves 120 homes with a total population of approximately 400 people and is located in the south end of Town, east of Cheshire Reservoir, the headwaters of the Hoosic River. There is a municipal water system in Cheshire, but there is no municipal wastewater disposal available. All facilities in Cheshire utilize on-site septic disposal. The municipal water system is located in the center of town and does not serve this area. The Water Company maintains and operates three water supply wells (Wells #2, #4 and

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

#5). Well #1 was abandoned and decommissioned in 1972. Wells #3 and #4 were used simultaneously until Well #3 collapsed. Well #3 was abandoned and decommissioned after Well #5 was installed to replace Well #3. Well #2 is maintained as an emergency supply source but is severed from the system due to high nitrate levels in the water. The source of nitrates in the gravel aquifer utilized by Well #2 is believed to be the adjacent agricultural activity. Presently, Wells #4 and #5 operate as the active well for the system and they operate simultaneously. Only Wells #4 and #5 will be addressed in this report.

Wells #4 and #5 are located east of the community, approximately 250 feet from the nearest residence and are located within 50 feet of each other. Well #4 was installed in 1979 and is a 155-foot deep, 6-inch diameter bedrock well with an approved withdrawal rate of 24,000 gallons per day (17 gpm) based on previous metered water use. Well #5 installed in 1997, is a 300 feet deep, 8-inch diameter well with 80 feet of casing set into the bedrock. The pumping test for Well #5 indicated the well and aquifer had a capacity of approximately 45 gallons per minute but well #5 was approved for a withdrawal rate of only 21 gpm as a replacement for Well #3.

Geologic mapping of the area indicates deep stratified drift deposits of sand and gravel west of the wells, in the Cheshire Reservoir/Hoosic River valley. Information from the owner indicates the depth of Well #2 is approximately 250 feet drilled into sand and gravel. These deposits were laid down during the recession of the glaciers some 18,000 years ago. Recent alluvial has likely been laid down in the center part of the valley where Cheshire Reservoir and the Hoosic River are located. The upland areas are generally covered with relatively thin till over bedrock although the side slopes may have varying thickness of overburden on top of the bedrock. Mapping indicates till over bedrock in the vicinity of Wells #4 and #5 although thin deposits of sand and gravel are evident from the mining operations nearby. Well #5 was constructed with 80 feet of casing set into bedrock. The bedrock is mapped as a metamorphic rock, the Cheshire Quartzite.

The Zone I is the area immediately surrounding the well and the Interim Wellhead Protection Area, (IWPA) provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. There is a hydrogeologic barrier (clay layer) at least in the immediate vicinity of the well. However, unless this hydrogeologic barrier is known to exist throughout the IWPA, the aquifer is considered to have a high vulnerability to contamination. Nonetheless, the hydrogeologic barrier that does exist provides some protection relative to impeding the downward migration of

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-		Contact DEP prior to increasing the system or conducting any additional activities in Zone I.
Residential Fuel Storage Above Ground	Both Wells	Both Wells	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	Both Wells	Both Wells	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Transportation Corridor	Both Wells	Both Wells	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

contaminants from areas overlying the barrier. The wells operate simultaneously but either well could supply the entire demand of the system. The Zone I and IWPA for Well #4 are 307 feet and 933 feet, respectively based on metered water use. The Zone I and IWPA for Well #5 are 310 feet and 1,070 feet, respectively based on pumping test data and the previous withdrawal rate of Well #3, the well that Well #5 replaced. Since the protection radii are similar and the wells are so close together, the protection areas for Wells #4 and #5 essentially overlap. Please refer to the attached map of the Zone Is and IWPAs.

Water from the wells serving the facility is not treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and**
3. **Transportation Corridor.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities or other non-threatening activities within the Zone Is. The Zone Is contain approximately seven residences including driveways, roads, parking spaces, residences and associated septic systems. Systems not meeting DEP Zone I requirements must notify the DEP, receive approval and address Zone I issues prior to increasing water use or modifying systems. In the recent past, there has been some truck traffic in Zone Is to access the adjacent gravel pit. The owner has prohibited the traffic.

### Recommendations:

- ✓ Based upon the current location of homes it may not be possible to prohibit vehicle parking within Zone Is; however, the company should consider educating residents' efforts to controlling activities in the Zone Is relative to fuel usage and use of household hazardous materials.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
- ✓ Consider efforts to have residents convert to propane or maintain tanks through tank age limitations and new tank standards.
- ✓ Consider replacing the wells if the gravel removal operation encroaches on the wells.

**2. Residential Land Uses** – The community served by the water company utilizes on-site septic disposal. There are approximate 60 residents within the protection areas. If managed improperly, activities associated with residential

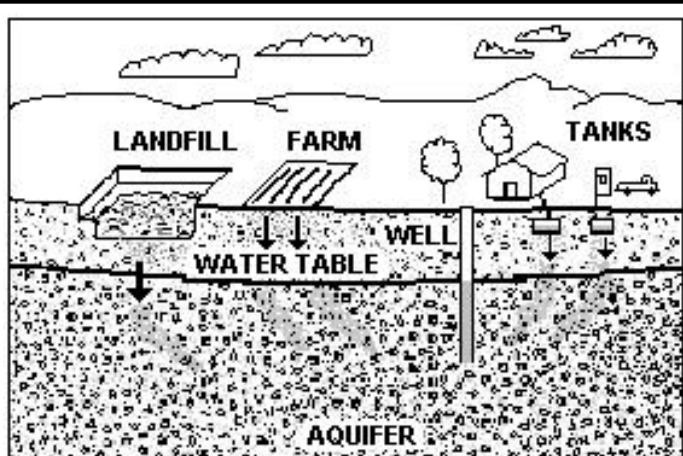


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store. Require fuel lines to be sleeved to protect from leaks.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on the following DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider a bylaw requiring that replacement heating/hotwater systems not be fueled by fuel oil or kerosene. Encourage maintenance of those tanks that exist and encourage conversion to propane.
- ✓ Continue efforts to manage wastewater disposal and maintenance of the systems.

**3. Transportation Corridor** – Minor roads and residential parking can be potential sources of contamination due to salting of roadways and leaks or spills of fuel and other hazardous materials during accidents. In addition, there has, in the past, been traffic within the Zone I to access the adjacent gravel pit.

### Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA is included in Emergency Response Planning.
- ✓ Continue to prohibit access through Zone Is.
- ✓ Consider replacing the wells if the gravel removal operation encroaches on the wells.

The Water Company is commended for recent measures taken to secure and protect the well casings and for prohibiting access through the Zone Is. Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. The facility should continue efforts in water supply protection through reviewing and adopting the key

recommendations above and the following:

**Zone I:**

- ✓ Keep non-water supply activities out of the Zone Is.
- ✓ Restrict use of salt within Zone Is and drain stormwater away from the wells.
- ✓ Continue to prohibit access to the Zone Is.
- ✓ Conduct regular inspections of the Zone Is.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
- ✓ Consider well relocation if gravel operations encroach significantly on the wells.

**Facilities Management:**

- ✓ Provide residents with Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on properties.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to include the facility's IWPAs in Aquifer Protection District Bylaws and be sure local emergency responders are aware of the protection areas in the event of an accident in the area.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Encourage residents to maintain and upgrade wastewater disposal systems.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Pine Valley Mobile Home Park

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 5, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Pine Valley Mobile Home Park
<b>PWS Address</b>	Wells Road
<b>City/Town</b>	Cheshire, Massachusetts
<b>PWS ID Number</b>	1058002
<b>Local Contact</b>	Mr. William Enser
<b>Phone Number</b>	(413) 243-1416

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well # 1	1058002-01G	262	667	Moderate
Well # 2	1058002-02G	262	667	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Pine Valley Mobile Home Park is located in Cheshire, Massachusetts, a small town in northern Berkshire County. The park accommodates 96 trailers with a total population of approximately 190 people and is located east of and across the Hoosic River from the center of town. There is a municipal water system in Cheshire but there is no municipal wastewater disposal available. The park and all facilities in Cheshire utilize on-site septic disposal. The municipal water system is less than ¼-mile from the park but currently does not serve the park. Therefore, water is supplied through two on-site water supply wells.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Wells #1 and #2 are located south of the trailer park approximately 165 feet from the nearest trailer and approximately 250 feet from a residence. There are no well construction logs available but the owner reports the wells are gravel packed wells with estimated yields of Wells #1 and #2 at 150 gallons per minute and 70 gallons per minute, respectively. The wells are constructed within a confined gravel aquifer with a clay layer between the ground surface and the well screened in the sand and gravel.

The Zone I is the area immediately surrounding the well and the Interim Wellhead Protection Area, (IWPA) provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. There is a hydrogeologic barrier (clay layer) at least in the immediate vicinity of the well. However, unless this hydrogeologic barrier is known to exist throughout the IWPA, the aquifer is considered to have a high vulnerability to contamination. Nonetheless, the hydrogeologic barrier that does exist provides some protection relative to impeding the downward migration of contaminants from areas overlying the barrier. The wells operate simultaneously but either well could supply the entire demand of the system. The protective radii are the same for both wells based on the maximum usage as reported from metered data: the Zone Is and IWPAs are 262 feet and 622 feet. Please refer to the attached map of the Zone Is and IWPAs.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and**
3. **Transportation Corridor.**

The overall ranking of susceptibility to contamination for the well is moderate, based on

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-		Contact DEP prior to increasing the system or conducting any additional activities in Zone I.
Fuel Storage Above Ground	Yes	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Transportation Corridor	Yes	Yes	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities or other non-threatening activities within the Zone I. The Zone I contains driveways, roads, parking spaces, residences and associated septic systems. Systems not meeting DEP Zone I requirements must notify the DEP, receive approval and address Zone I issues prior to increasing water use or modifying systems. The system has been working toward having residents convert to propane and remove fuel oil from Zone I.

### Recommendations:

- ✓ Based upon the current location of homes it may not be possible to prohibit vehicle parking within the Zone I; however, the Park should continue efforts to controlling activities in the Zone I relative to fuel usage and use of household hazardous materials.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the well.
- ✓ Continue efforts to have residents convert to propane or maintain tanks through tank age limitations and new tank standards.

2. **Residential Land Uses** – Pine Valley and the surrounding residences all utilize on site septic disposal. Pine Valley is presently working with the DEP to stay in compliance with wastewater requirements. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of

contamination due to leaks or spills of the fuel oil/kerosene they store. Require that fuel lines are sleeved to protect from leaks.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on the following DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider a bylaw requiring that replacement heating/hotwater systems not be fueled by fuel oil or kerosene. Encourage maintenance of those tanks that exist and encourage conversion to propane.

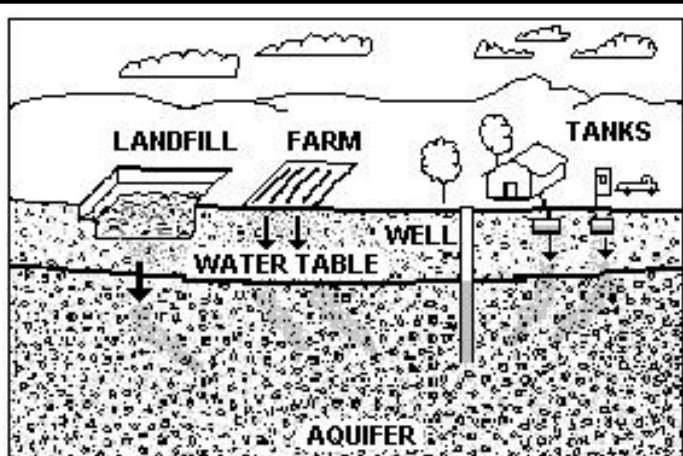


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Continue efforts to manage wastewater disposal and maintenance of the systems.

3. **Transportation Corridor** - Major roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

#### Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA is included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Pine Valley Mobile Home Park is commended for their past efforts to utilize deep wells that are fairly remote from the facility, posting signs in the Zone Is, and educating tenants on wellhead protection issues. The facility should continue efforts in water supply protection through reviewing and adopting the key recommendations above and the following:

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone Is.
- ✓ Restrict use of salt within Zone Is and drain stormwater away from well.
- ✓ Consider connecting to town water if threats cannot be mitigated or water quality is impacted.
- ✓ Conduct regular inspections of the Zone Is.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.

#### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

#### Planning:

- ✓ Work with local officials in town to include the facility's IWPA in Aquifer Protection District Bylaws.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Continue efforts to maintain and upgrade wastewater disposal systems.

#### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Chester Elementary School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 30, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Chester Elementary School
<b>PWS Address</b>	Middlefield Road
<b>City/Town</b>	Chester, Massachusetts
<b>PWS ID Number</b>	1059012
<b>Local Contact</b>	Dr. David Hopson/Ms. Norene St. Martin
<b>Phone Number</b>	(413) 685-1000

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA</b>	<b>Source Susceptibility</b>
Well #1	1059012-01G	133	437	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Chester Elementary School is a small, rural school with a total student and staff population of approximately 110 people per day, located on Middlefield Road in the town of Chester, Massachusetts. The school, which was completed in 2003, serves the Towns of Chester and Middlefield, which are rural residential and recreational communities situated in the Berkshire foothills in western Massachusetts. The Town of Chester does have a municipal water system but it does not serve this area of Town. The Town does not have a municipal wastewater system. Therefore, the school operates



## What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

a single public water supply well and disposes of wastewater through an on-site septic system. The school well is a 6inch diameter, 350-foot deep bedrock well that is located immediately adjacent to the school soccer field. Bedrock was encountered at 39 feet below grade but the casing was extended to 60 feet below grade into sound bedrock. The well casing extends above grade and has a secure well cap.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. An Interim Wellhead Protection Area (IWPA) is a primary recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA. The Zone I and IWPA protective radii for Well #1 are 133 feet and 437 feet respectively based on the approved withdrawal rate of 1,656 gallons per day for the well. The well was tested and approved through the New Source Approval process and although the soccer field is in the western half of the Zone I, the DEP has approved that use provided pesticides and fertilizers are not used on the field. Therefore the well is considered to be conforming with Zone I requirements.

The IWPA of the well includes a 500-gallon propane underground storage tank (UST), a 6,000 gallon No. 2 fuel oil UST, a diesel powered backup generator, the boiler room, the tank room, some components of the septic system, part of the school, the CSX railroad track and Middlefield Road. In addition, the remainder of the school, the closed and capped Chester wood waste landfill, and the septic system leachfield are located north of (approximately 300 feet and 500 feet, respectively) but outside of the IWPA. The DEP Division of Solid Waste regulates the landfill. Prior to construction of the school and well, an extensive environmental assessment of the landfill was conducted, a risk assessment completed and the landfill was consolidated, closed and capped. There were preliminary monitoring requirements during the school development and there are long-term monitoring requirements of soil gas and groundwater quality for sampling points located between the landfill and the school. For further information regarding the Town's regulatory compliance with respect to the landfill, contact the DEP Bureau of Waste Prevention, Solid Waste Division in Springfield. For further information regarding the permitting of the school well, contact the Drinking Water program.

Geologic mapping indicates the school is located in the Berkshire foothills on the east limb of the Berkshire anticlinorium. The uplands are covered with thin till overburden

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Conforming Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Septic system components	No	Yes	Moderate	Maintain septic system. The school leachfield is outside of protection areas.
Transportation corridors, railroad track, school parking and stormwater structures	No	Yes	Moderate	Control the use of deicers and coordinate with emergency response personnel and the railroad company. Monitor for leaks and spills near the well.
School	No	Yes	Moderate	Use BMPs for school facilities.
Underground storage tank (fuel oil/propane); diesel generator	No	Yes	High/Low	Use BMPs and monitor for leaks and spills especially during deliveries.
Athletic fields	Yes	Yes	Low	Continue to prohibit the use of fertilizers and pesticides in Zone I.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

covering the bedrock. The school is located on the west side of the narrow river valley between the railroad track and the West Branch of the Westfield River. The valley fill is sand and gravel deposited by the receding glaciers 14,000 to 18,000 years ago and was likely reworked by recent streams and rivers with additional recent alluvium deposited. The bedrock at the school site is mapped as light grey to green quartz-plagioclase-granulite or schist of the Moretown Formation. There is no evidence of a continuous confining, clay layer or a thick till layer in the immediate vicinity of the well. Wells located in these conditions are considered to be located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from activities on the ground surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is treated through an ion exchange water softener prior to distribution. The DEP requires public water suppliers to regularly monitor the quality of the water. For current information on monitoring results and treatment, please refer questions to the Public Water System contact person listed above in Table 1 for the most recent information. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the EPA's website for Envirofacts.

## Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

## 2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination. Although most of the agricultural activities are outside of the Zone I and IWPA, because the IWPA is not a scientifically determine recharge area, the DEP often identifies activities that are near the source.

### Key issues include:

1. **Zone I;**
2. **School and Athletic fields ;**
3. **Underground storage tank; and**
4. **Transportation corridor/parking.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use or activity in the protection areas of the well, as seen in Table 2. The fuel oil UST located within the IWPA is ranked as a high threat; the tank is a new tank that is constructed in compliance with current UST regulations.

**1. Zone I –** Well #1 has a conforming Zone I with respect to ownership and activities within the Zone I. There is a soccer field within the Zone I of Well #1, however, the DEP may allow passive recreational activities and non-threatening activities within the Zone I. The school does not use pesticides or fertilizers within the Zone I.

### Recommendations:

- ✓ Continue using BMPs to protect the water supplies.
- ✓ Do not allow any non-conforming activities within Zone I. Inspect the well cap regularly to ensure security and that there is no standing water around the casing.
- ✓ Do not use pesticides and fertilizers in the Zone I.

**2. School and athletic fields –** The athletic field is within the Zone I and some of the school facilities are within the IWPA of the well. However, although the grease trap and some components of the wastewater system are within the IWPA, the leachfield for the septic system is approximately 500 feet away from the IWPA for the well. Elementary schools generally use only household hazardous materials and the recommendations for small schools are similar to those for residents. In addition, there are state and federal controls on some activities and products used at schools to promote “healthy schools”.

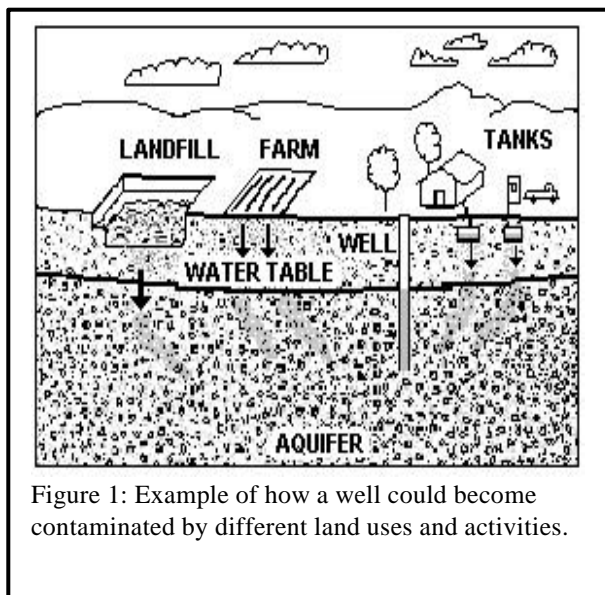


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

Potential exists for contamination of the well by on-site use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. If managed improperly, activities associated with residences and the school can contribute to drinking water contamination. The school presently does not use pesticides or fertilizers on the field. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, petroleum products for home equipment and lawn maintenance equipment and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail are not properly maintained, they could be a potential source of microbial contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source Pollution web site for additional information at the following MADEP website <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### School and Residential Use Recommendations:

- V The tank room is used for storage of supplies and some equipment. There is a floor drain in the tank room, which according to the school, is connected to the parking lot stormwater discharge system that discharges to a detention basin south of the soccer field. During the assessment, it was noted that cleaning equipment and cleaning materials were stored in the tank room. The cleaning materials are no longer stored in the tank room and will be stored in the janitor's closet where there is a low level, janitor's sink but there is not a floor drain in the room.
- V Continue the use and maintenance of BMPs for activities within close proximity to the well.
- V If annual floor cleaning requires the use of hazardous materials, dispose of the residual as appropriate.
- V Continue to prohibit the use of pesticides or fertilizers within the Zone I of the well. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers. Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- V Continue to use secondary containment for any petroleum products kept for maintenance and lawn care equipment. Presently, the maintenance equipment is kept in a storage trailer on the south side of the school.
- V Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V Refer to the Massachusetts Public Health Association's Healthy Schools website for additional information at: [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html)

**3. Underground fuel oil storage** – There is one fuel oil UST, one propane UST and a diesel fueled generator located within the IWPA. The propane UST poses minimal threat to the water supply, the UST fuel oil tank is a double walled tank with monitoring and the diesel generator AST is also double walled to protect against leaks. If managed improperly, fuel oil tanks can be a potential source of contamination due to leaks or spills of the materials they store.

**Recommendation:**

- ✓ Any modifications to the tanks must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site.

**4. Transportation corridor and parking** – The CSX railroad, Middlefield Road and parking areas for the school are within the IWPA of the well. The storm drains for the parking areas are directed to detention basins south (downgradient) of the well location but within the IWPA. Accidents and normal use and maintenance of roads, parking lots and railroads may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- ✓ Notify the Town Highway Department of your well. Review the stormwater management near the well with the Highway Department and work to ensure runoff is directed away from the well.
- ✓ Contact the Town Board of Health or Selectmen regarding the review of the railroad company's Yearly Operating Plan (YOP) for right-of-way maintenance. Be sure they are aware of the protection areas for your new well.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The Chester Elementary School is commended for design criteria that direct stormwater downgradient of the well and for removing floor drains from the boiler room design. The Department recommends that you request your boiler maintenance contractor have absorbent materials on hand in the event of an accidental spill and that any boiler blow down generated during maintenance must be disposed of off-site by the contractor.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Davenport Building

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 14, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Davenport Building</b>
<i>PWS Address</i>	<b>Route 143</b>
<i>City/Town</i>	<b>Chesterfield</b>
<i>PWS ID Number</i>	<b>1060001</b>
<i>Local Contact</i>	<b>Mr. William Enser</b>
<i>Phone Number</i>	<b>413-243-1416</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1060001-01G	100	407	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Davenport Building is located on the north side of Route 143 in the center of Chesterfield and was formerly the elementary school for the Town. A regional school was built in the late 1990 and the Davenport Building now is utilized for Town Offices, a daycare center and as a general community center. The estimated population for the facility is approximately 75 people. The Building is supplied by a single potable supply well (Well #1 -01G) located approximately 5 feet from the west side of the building.

The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller. The current

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

well has a Zone I protective radius of 100 feet and an Interim Wellhead Protection Area (IWPA) radius of 408 feet based on estimated water use utilizing Title 5 flow volumes. Water use of less than 300 gallons per day was confirmed when the facility installed a meter during 2002. Please refer to the attached map that shows the Zone I and IWPA.

There are no records regarding the construction or depth of the well. The geologic map of the area shows complex bedrock structure in the area and describes the bedrock as the Goshen Formation, a quartzite and quartzite schist. The overburden is generally thin till with no evidence of a hydrologic barrier to potentially threatening activities at the ground surface. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. At the time this report was prepared, water from the Building's well is not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Septic system components,**
3. **Floor drain in boiler room,**
4. **Parking and roadway, and**
5. **Residential uses.**

There are activities within Zone I that are not related to water supply and the well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration from the surface. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System components	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Floor Drain in the boiler room to septic system	Yes	Yes	Moderate	Floor drain must be protected from accidental spills or connected to tight tank.
Parking area and roadway	Yes	Yes	Moderate	Storm water drains away from the wellhead.
Aboveground oil tank	Yes	Yes	Moderate	Tanks are in containment.
Residential land use	Yes	Yes	Moderate	Provide residents and staff with BMPs.

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions which only allow water supply related activities or non-threatening activities in Zone I. The facility's Zone I contains the building, oil tanks, roads and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Maintain contact with the DEP regarding alternatives to the existing source.
- ✓ Monitor activities within the Zone I and minimize, as much as is feasible, activities in Zone I.
- ✓ Do not store hazardous materials in the Zone I. Where household hazardous materials are required, keep the materials in containment and use the materials with extreme caution. Dispose of waste through household hazardous waste pick-ups or store securely and in containment.

**2. Septic system components** - The septic tank, grease trap, pipeline, distribution box and leachfield are all within the Zone I or IWPA of the well. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals or petroleum products to septic systems or discharge from the boiler room are also potential sources of contamination to the leachfield. The Highway Department is scheduled to have a tight tank installed for the garage.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, certified operator, daycare staff and citizens that use the facility.
- ✓ Septic system components should be inspected and maintained on a regular basis.

**3. Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for oil or hazardous materials to flow accidentally into the floor drain, however, the floor drain must be sealed or connected to a tight tank if no sewer is available. Boiler compressor condensate is considered industrial wastewater, and therefore cannot be discharged to the septic system. The boiler room at the Building has a floor drain that is assumed to discharge to the septic system.

### Recommendations:

- ✓ Prepare a written policy and plan for maintenance operations, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off-site.
- ✓ If protection of the floor drain cannot be assured, seal the floor drain or a tight tank must be installed for the floor drain.
- ✓ Contact the DEP Underground Injection Control (UIC) program coordinator to discuss this issue (Rick Larson 413-755-2207 or Jim Gibbs 413-755-2299)

**4. Parking and roadway** - The parking areas and Route 143 are within the Zone I and IWPA of the well.

### Recommendations:

- ✓ Use minimal road salt and deicers.

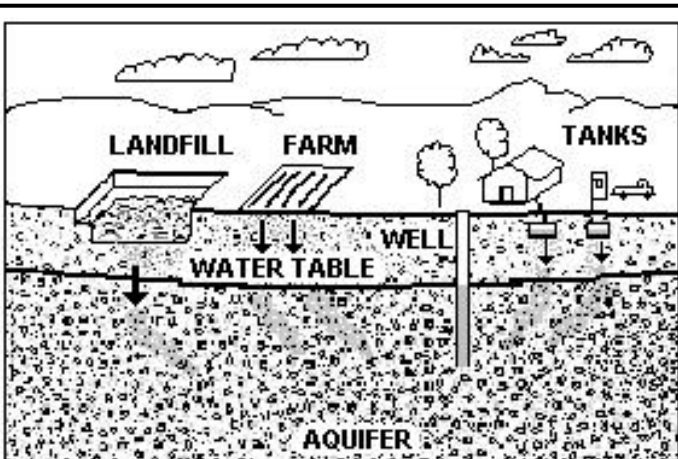


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### Facilities Management:

- ✓ Septic system components should be maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Train staff on use of non-toxic materials cleaning and maintenance materials and in the handling of hazardous materials, including household hazardous materials.

- ✓ Monitor the parking lot for spills and leaks.
- ✓ Monitor runoff from the parking area to ensure it continues to flow away from the well.

**2. Residential Land Uses** – The Zone I and IWPA for Well #1 has medium-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I and monitor the area for spills and leaks.
- ✓ Monitor oil delivery and storage.
- ✓ Post drinking water supply signs at key location such along the access road and in the parking area away from the well.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Do not use fertilizer or pesticides.
- ✓ Use Best Management Practices (BMPs) for hazardous products.

**Planning:**

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet
- UIC Closure documents



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for New Hingham Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
October 10, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>New Hingham Elementary School</b>
<i>PWS Address</i>	<b>30 Smith Road</b>
<i>City/Town</i>	<b>Chesterfield</b>
<i>PWS ID Number</i>	<b>1060004</b>
<i>Local Contact</i>	<b>Mr. William Enser</b>
<i>Phone Number</i>	<b>413-243-1416</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1060004-01G	257	646	Low

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

New Hingham Elementary School is a regional elementary school located in Chesterfield. The school serves pre-school through sixth grade and has a population of approximately 200 staff and students. There are no municipal water or wastewater systems in Chesterfield and therefore, the facility is served by an on-site water supply and wastewater disposal through a septic system. The well was installed in 1996 to a depth of 440 feet and hydrofractured to enhance water flow to the well.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I for a well is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The approved withdrawal rate for Well #1 is 10.3 gallons per minute based on the results from an extended duration pumping test conducted as part of the New Source Approval Process. Based on that maximum daily withdrawal rate, the Zone I and IWPA radii for Well #1 are 257 and 646 feet, respectively. All of the school facilities are located outside of the IWPA. Only walking and field mowing are conducted in the Zone I and IWPA.

New Hingham Elementary School is located in an area of thin overburden (till/hardpan) on top of bedrock. There is no evidence of a confining, protective layer of clay or thick till in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to potential contamination from activities conducted on the land in the recharge area to the wells due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

Water withdrawn from the school's well does not require treatment, and is not treated at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The Zone I is owned and controlled by the School District and therefore is in compliance with DEP requirements. There are few potential sources of contamination within the mapped drinking water supply protection areas.

#### Key issues include:

1. **Passive recreation**
2. **Lawn/field mowing**

The overall ranking of susceptibility to contamination for the New Hingham Elementary School well is low, based on the presence of a few low ranked potentially threatening land uses or activities in the IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Passive recreation	No	Yes	Low	Inspect the area regularly and monitor activities.
Lawn/field mowing	Yes	Yes	Low	Use caution when utilizing equipment with petroleum products near the well

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



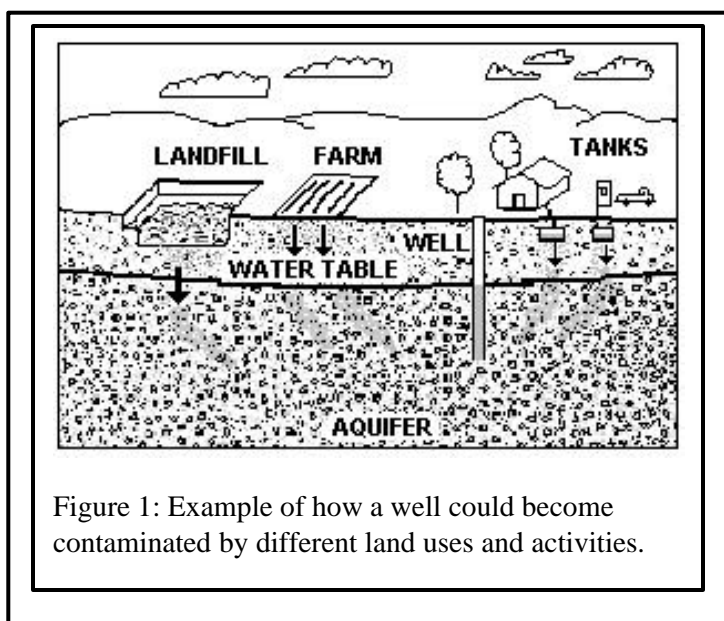


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Passive recreation** – The well is located in a rural area and recreation is not encouraged. All of the school facilities are located outside of the IWPA but the area is accessed infrequently for passive recreation.

#### Transportation corridor Recommendations:

✓ Monitor the area regularly.

**2. Lawn/field mowing** – The Zone I and IWPA areas are maintained for access.

✓ Use equipment near the well with caution.

The school district is commended for development of a source in such a well-protected area.

### Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The school should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

✓ Continue efforts to control access to Zone I and monitor activities in the IWPA area.

#### Zone I:

✓ Keep non-water supply activities out of the Zone I.  
✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.

#### Training and Education:

✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.  
✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.

#### Planning:

✓ Have a plan to address short-term water shortages and long-term water demands.  
✓ Keep the phone number of a bottled water company readily available in the event of an emergency.  
✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**For More Information:**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this report have been forwarded to the water supplier and Town officials.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
CHESTERFIELD GENERAL STORE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Chesterfield General Store
<i>PWS Address</i>	432 Main Rd
<i>City/Town</i>	Chesterfield, Massachusetts
<i>PWS ID Number</i>	1060005

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #2	1060005-02	100	422	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

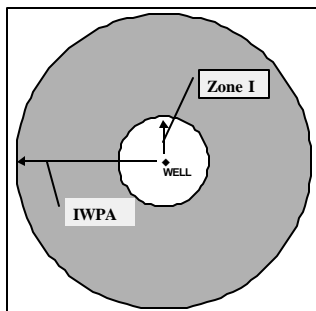
Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1060005-02G)**

Zone I = 100 ft.  
IWPA = 410 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Reports, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection

## Source Water Assessment and Protection (SWAP) Report

### for

## Briggsville Water District

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Briggsville Water District</b>
<i>PWS Address</i>	<b>47 Cross Road</b>
<i>City/Town</i>	<b>Clarksburg, Massachusetts</b>
<i>PWS ID Number</i>	<b>1063003</b>
<i>Local Contact</i>	<b>Mr. Clebe Scott</b>
<i>Phone Number</i>	<b>413-663-3985</b>

Zone II GIS ID # 586

<i>Spring Name</i>	<i>Zone I, ft (sqauret)</i>	<i>Susceptibility</i>
Red Mill Spring	1063003-01G	Moderate

#### Introduction

We are all concerned about the quality of the water we drink. Groundwater sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

#### 1. Description of the Water System

Briggsville Water District is a small community system that serves a residential population of approximately 180 in the Briggsville section of Clarksburg. Clarksburg is a small, primarily rural, residential community in the northwest corner of Massachusetts with limited commercial and industrial activity. The District maintains one spring source



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

of water, the Red Mill Spring that provides water to the system by gravity flow. The general public utilizes the overflow from the system's cistern as a spring water source.

The system consists of collection cisterns with a concrete storage facility constructed on a steep embankment, immediately south of the North Branch of the Hoosac River and east of the confluence of an unnamed brook with the river. The USGS has identified the spring as a bedrock spring, discharging water from fractured bedrock. The bedrock is mapped as the Hoosac Schist, a quartz, biotite schist. The hill upgradient of the spring and delineated as the Zone II contribution area of the spring, is mapped as a structural anticline. The immediate vicinity of the spring has some minor unconsolidated sand and gravel materials of undetermined thickness. The collection boxes were constructed in the sand and gravel and the area graded to protect the springs from surface influences. There is no evidence of a significant and continuous protective, confining unit within the contribution area to protect the source from activities conducted on the land surface. Sources located in aquifers such as this are considered to be highly vulnerable to contamination from activities conducted within the recharge areas.

The Zone I is the most protected area around a groundwater source. The Zone I for a spring is a square area centered on the source in the direction of flow with the source 50 feet from the downgradient edge of the Zone I. The lengths of the sides of the square are based on the estimated flow from the spring or estimated volume of water used from the source. The maximum estimated flow from the springs was over 175 gallons per minute and therefore the length of the sides of the square Zone I area is 800 feet. The USGS was contracted by the DEP to determine the contribution areas (Zone II) to spring sources as part of the SWAP program. Please refer to the enclosed map for the outline of the protection areas for the District's source. The entire Zone I and Zone II areas are forest and residential development. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Low levels of tetrachloroethylene are routinely detected in the water sampled downstream of the spring. The source of the compound is believed to be from a length of vinyl lined, asbestos-concrete distribution pipe and it is not in the source water. The District controls the levels through a flushing program and continuously bleeding water through the lines. Please refer to the attached maps of the Zone I and Zone II protection areas and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Non-Conforming Zone I	Yes	-	-	Contact DEP prior to expanding or conducting any activities in Zone I
Transportation corridor	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	Yes	Yes	Moderate	Supply BMPs to residents
Septic system components	Yes	Yes	Moderate	Supply BMPs to residents

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

There are a few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I**
2. **Residential land use**
3. **Transportation corridors and right-of-way**

The source is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate ranked activity in the protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The District does not own or control the entire Zone I for its source. DEP requires ownership or control of Zone I and restrictions for Zone I allowing only water supply related activities in Zone I or activities that do not pose a potential threat. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. There are two abandoned homes and at least three occupied residential properties as well as the road, in Zone I.

### Recommendations:

- ✓ Maintain control of access to the spring and control surface runoff in the area.
- ✓ Monitor activities in the recharge areas and consider acquiring additional land to protect the sources in the future.
- ✓ Pursue options for acquiring ownership or control of Zone I.

**2. Residential Land Use** – There are several residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the

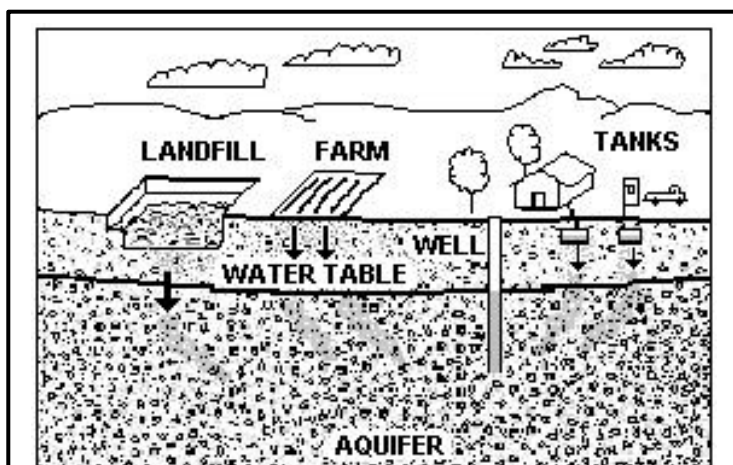


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

fact sheet "Residents Protect Drinking Water" which is attached in Appendix A and is also available at the website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), where BMPs are provided for common residential issues.

- ✓ Consider inventorying heating sources in the Zone II area including USTs.
- ✓ Inventory home occupations that may pose a potential threat to the water source, as appropriate.

**3. Transportation corridor and right-of-way** – The Zone II includes primarily rural residential roads that are relatively lightly traveled. The greatest threats from roads are deicing materials, an accidental spill, and illegal access. There is also a utility right-of-way through the Zone II. Rights-of-way are often maintained for vegetation control.

#### Transportation corridor and right-of-way Recommendations:

- ✓ Work with the Town to ensure that road runoff is directed where feasible, to water quality swales.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the Water District, the Town and State Police in the event of an accident within the protection areas.
- ✓ Review the Yearly Operating Plan (YOP) for the utility to ensure that they are utilizing current maps that show the Zone II contribution area for the spring. Contact the North Adams Conservation Commission regarding the YOP.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. With the delineation of the Zone II contribution areas for the spring, the District should review the existing protection plan, update information as appropriate and work with the community in development of additional protection strategies as appropriate. Please review and adopt the key recommendations listed above, as is feasible.

#### Zone I:

- ✓ Prohibit non-water supply activities in Zone I.
- ✓ Continue regular inspections of the Zone I. Monitor for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the spring.

#### Facilities Management:

- ✓ Consider long term plans for water main replacement and additional land acquisition

#### Planning:

- ✓ Conduct a detailed review of land and land use within the delineated recharge area. Monitor proposed development and activities within the recharge area. Work with the Board of Health and Planning Board to protect the areas.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available and continue assessment of future needs of the system.
- ✓ Consider acquiring additional land and monitor proposed activities in the recharge areas. Recent experience has shown that activities such as logging upgradient from spring sources can impact water quality.

Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities. These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- ✓ Map of the Public Water Supply (PWS) Protection Area
- ✓ Recommended Source Protection Measures Fact Sheet



# Source Water Assessment Program (SWAP) Report for Clarksburg Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 24, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Clarksburg Elementary School
<i>PWS Address</i>	777 West Cross Road
<i>City/Town</i>	Clarksburg, Massachusetts
<i>PWS ID Number</i>	1063008
<i>Local Contact</i>	Dr. John D. Barry, Superintendent
<i>Phone Number</i>	413-664-9292

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1063008-01G	140	442	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Clarksburg Elementary School is an elementary school with a total staff and student population of approximately 250 people. It is located in a rural, residential setting immediately on the southeast side of Cross Road approximately one-half mile north of Houghtonville, a village within Clarksburg. Well 1 is the sole source of water for the school and is immediately north of (within five feet) the school wall. The Zone I protective radius for Well 1 is 131 feet and the Interim Wellhead Protection Area (IWPA) radius is 436 feet. The protective radii were based on metered usage for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well 1, a 6-inch diameter well, is reportedly drilled to a depth of approximately 400 feet. The well is located in a 5-foot deep pit, with a locking bulkhead cover that has been bermed to prevent parking lot runoff from entering the pit. There is no record of final construction of the well or of the materials encountered during drilling. The Geologic Map of the North Adams Quadrangle shows three bedrock contacts on the school property parcel. An inferred contact between the Kitchen Brook Dolomite and the Cheshire Quartzite is in the immediate vicinity of the well while an inferred contact with the Dalton Formation (a quartzite, schist conglomerate) is mapped north of the school near the road. The bedrock geology is complex series of folded and faulted bedrock with beds dipping to the east at the school. There is no information regarding the depth to bedrock at the school well. Bedrock wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Clarksburg Elementary School well water does not require and does not have treatment at this time. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

Numerous land uses and activities within the drinking water supply protection areas are potential sources of contamination.

### Key issues include:

1. **Non-conforming Activities in Zone I**
2. **Storage room in IWPA**
3. **Aboveground Fuel Oil Storage in IWPA**
4. **Floor drain in boiler room**
5. **Septic components in Zone I and IWPA**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderately ranked land uses or activities in the Zone I and IWPA, as seen in Table 2.

1. **Non-conforming activities in Zone I** – Currently, the well does not meet DEP's restrictions that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, a library, the septic tank, and parking areas. The public water

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
School Structures	Yes	Yes	--	Continue policy of no fertilizer or pesticide usage
Aboveground Fuel Storage (AST)	No	Yes	Moderate	Aboveground heating oil in containment
Storage room	No	Yes	Moderate	Storage room with old science waste
Parking lot & roads	Yes	Yes	Moderate	Limit road salt usage, monitor for leaks and spills
Septic system components	Yes	Yes	Moderate	Recommend connecting to sanitary sewer
Low density residential w/sewer	No	Yes	Moderate	Pesticide brochures in the attachments
Floor drain	Yes	No	Moderate	Boiler room

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/). \*\* See Appendix A



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

supplier owns all but a very small portion of land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, conducting any additional activities in Zone I or modifying systems.

### Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well.
- ✓ Raise the wellhead above grade to prevent flooding and provide protection to the wellhead.
- ✓ Post signs and inspect the parking area for leaks and accidental spills. Prepare an emergency response plan to address accidents.

**2. Storage room in IWPA** – The storage shed located in the rear of the school, at the time of the visit contained various science classroom supplies. The bulk of the materials were reagents and indicators, which pose minimal hazard. However, there were some items such as acids, turpentine and denatured alcohol. The Superintendent noted that the bulk of the materials have been removed and properly disposed of. The remainder is scheduled for disposal in the near future. The District is commended for taking action to protect the supply and the DEP recommends that following to support that effort.

### Recommendations:

- ✓ Although generally there is little use of hazardous materials in an elementary school, periodically during cleaning or maintenance, household hazardous waste is generated. Review the attached documents “A Summary of Requirements for Small Quantity Generators of Hazardous Waste” and a fact sheet for Very Small Quantity Generators to determine your status and regulatory requirements.
- ✓ Contact Hilary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us) regarding proper hazardous material use, storage, disposal, emergency response, and best management practices. Develop a procedure for storage and disposal of any household type hazardous materials either through the Town's hazardous waste collection days or through other appropriate means. Develop a simple plan to ensure participation of all appropriate staff. Include all of the school staff such as teachers, custodial, groundskeepers, certified operator, and food preparation staff in the training.

**3. Aboveground Fuel Oil Storage Tank (UST)** – The fuel oil is stored in 4 above

ground, 330-gallon storage tanks. The tanks are located within adequate cement containment, in a secured shed approximately 195 feet from the well. ASTs are more protective than underground storage but still pose some concern in close proximity to the well. An AST in the IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel near the well. The containment structure provides a significant margin of protection from accidental release.

### Recommendations:

- ✓ Closely monitor activities associated with the fuel tank refilling and usage.
- ✓ Any further modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

**4. Floor Drain** - The floor drain in the boiler room is required to protect the school from accidental plumbing failure. However, the floor drain discharges to the septic

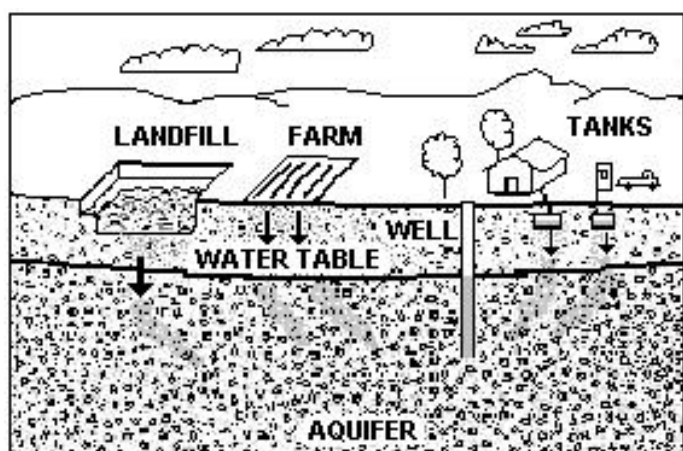


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

system; Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be protected to prevent boiler blow down or other prohibited discharges through the floor drain. There are no hazardous materials stored in the boiler room and an outside contractor maintains the boiler.

### Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ If protection measures are not taken, an alternative is to install a tight tank and connect the boiler room floor drains to the tank.
- ✓ Another alternative is to request to connect to the sanitary sewer that runs along the street. An oil water separator may be required.

**5. Septic system components in the Zone I and IWPA** – The septic system piping and tank are in the Zone I and the school's two leach fields are in the IWPA. An IWPA is considered a nitrogen sensitive area in the Title 5 regulations, which may in some instances result in additional treatment requirements. It is our current understanding that the school is moving forward with plans to connect to the municipal sewer.

- ✓ The Department strongly recommends constructing an external to the building, DEP standard design kitchen grease trap and connecting all wastewater discharges to the North Adams sanitary sewer system. Both the Department and the EPA, in letters to the Clarksburg Town Administrator dated May 23, 2001 and June 18, 2001, have endorsed this action to protect the water supply at the school and public health and safety.
- ✓ Septic system components should be inspected and maintained on a regular basis until such time that the system is connected to the sewer. Refer to the Appendices for more information regarding septic system

Other activities noted during the assessments were parking, roadways and storm water runoff. Storm water runoff ultimately either discharges into the ground or to nearby surface water bodies. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Minimize parking in the Zone I, post drinking water signs and monitor the area for leaks and accidental spills. Residential homes surround the school. Residential homes pose minimal threat to public and private water supplies provided home owners use Best Management Practices with respect to septic system maintenance and disposal practices, household hazardous waste, auto care and lawn and pest control. Work with your community to continue providing information regarding the use of Best Management Practices. The DEP can provide your community with information on how to develop public outreach and support local protection measures.

Finally, the Clarksburg Highway Department Garage is located approximately 600 feet

northeast of the well. Although the facility is not within the IWPA of the well, the close proximity warrants that the Town ensures BMPs are employed for activities involving hazardous materials storage, use and disposal. The facility is currently not registered as a Hazardous Waste Generator. A copy of the requirements for registration will be sent to the Clarksburg Board of Selectmen. In addition, although the floor drains in the facility were sealed, there is no indication that an investigation of the discharge point of the floor drains was conducted as part of the closure, as is required. State plumbing code requires adequate drainage capacity in facilities. It is our understanding from the Highway Superintendent that a tight tank is proposed to comply with that code and an investigation of the discharge area will be conducted. The Department strongly recommends the investigation be conducted as soon as is feasible.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The staff of the Clarksburg Elementary School is commended for current protection measures. The Clarksburg Elementary School in conjunction with the district and local officials should review and adopt the key recommendations above and the following:

#### **Priority Recommendation:**

- ✓ Connect to the municipal sewer system.

#### **Zone I and IWPA:**

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Monitor all non-compliant activities in the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check area for accidental spills and leaks, etc.
- ✓ Maintain road and parking lot drainage and catch basins.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Register as a VSQG and properly dispose of all potentially hazardous materials stockpiled in the storage facility
- ✓ Investigate and consider requesting a connection to the municipal sewer system.

#### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies or other references).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

#### **Facilities Management:**

- ✓ Prohibit non-sanitary wastewater discharges to on-site septic systems. Post signs near sinks as appropriate.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Generally there is little use of hazardous materials in an elementary school. However, periodically during cleaning or maintenance, household hazardous waste is generated. Contact Hilary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us) regarding proper hazardous material use, storage, disposal, emergency response, and best management practices. Develop a procedure for storage and disposal of any hazardous materials either through the Town's hazardous waste collection days or through other appropriate means. Make the process simple to ensure participation of all appropriate custodial staff. The school will have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ Septic system components should be inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete wellhead protective pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers, including pole mounted transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Contact the utility if the area near the transformer has tree limbs that could endanger the transformer in a storm.

#### **Planning:**

- ✓ Work with local officials in Clarksburg to encourage the development of and implementation of Aquifer Protection Bylaws that would include public water supply protection areas, including the school well's IWPA. The Department can assist your community in developing wellhead protection bylaws.
- ✓ Review and update as appropriate, your plan to address short-term water shortages and long-term water demands. Keep

- the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers address Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Wellhead Protection Grant or the Source Water Protection Technical Assistance/Land Management Grant Program. For additional information, please refer to the attached program fact sheet. Please note that each program year, the Department posts a new Request for Response (RFR – grant application form) for the Grant programs on the internet on or about May 1 and the response is due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **3. Attachments**

- A Summary of Requirements for Small Quantity Generators of Hazardous Waste
- Fact sheet for Very Small Quantity Generators
- Preparing a Wellhead Protection Plan
- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Colrain Fire District #1

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
October 15, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Colrain Fire District #1
<i>PWS Address</i>	River Road
<i>City/Town</i>	Colrain, Massachusetts
<i>PWS ID Number</i>	1066000
<i>Local Contact</i>	Ms. Dorothy Conway
<i>Phone Number</i>	413-624-8833

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1066000-02G	324	1,093	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Colrain is a small, rural, hilltown community in northwestern Massachusetts along the Vermont border. The Colrain Fire District #1 serves 42 residential connections, a population of approximately 150 people. There is a municipal wastewater treatment facility in Colrain, and municipal sewer is available to serve parts of Colrain but not the area served by the District. Therefore, the area where the well is located is served by on-site septic disposal systems. The District maintains and operates a single 12x18-inch diameter, 60-foot deep, gravel packed well located within the floodplain of the North River. Based on the results of a 48-hour pumping test conducted in 1994 when the well was installed, the source has an approved withdrawal rate of 31 gallons per minute (44,640 gpd). Well #2 (02G) replaced Well #1 (01G), which was a series of three well points that lost capacity and were abandoned.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the daily pumped volume from the well, are 347 feet and 1,392 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Well #2 is located on the down gradient edge of an unconfined sand and gravel deposit along the North River valley. The deposits were laid down in a bedrock valley during the recession (melting) of the glaciers some 14,000 – 18,000 years ago. More recent alluvial deposits have been laid over the glacial deposits in the floodplain of the North River. There is no record or evidence of a confining, protective clay layer in the vicinity of the well. The bedrock underlying the area is mapped as the lower portion of the Conway Formation, predominantly micaceous schist. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Well #2 is also located within close proximity to the North River and downstream of the leading edge of a large river meander. There has been some concern regarding the long-term stability of the bank of the river as it naturally cuts closer to the well. The riverbank is somewhat stabilized by riprap along the shore nearest to the well.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #2 (02G) include a hay field, the river and forest and floodplain on the east side of the river. Approximately 40% of the IWPA protection area is crop or pasture land. There are few potential sources of contamination within the mapped drinking water supply protection areas. However, the actual recharge area for the source has not yet been delineated.

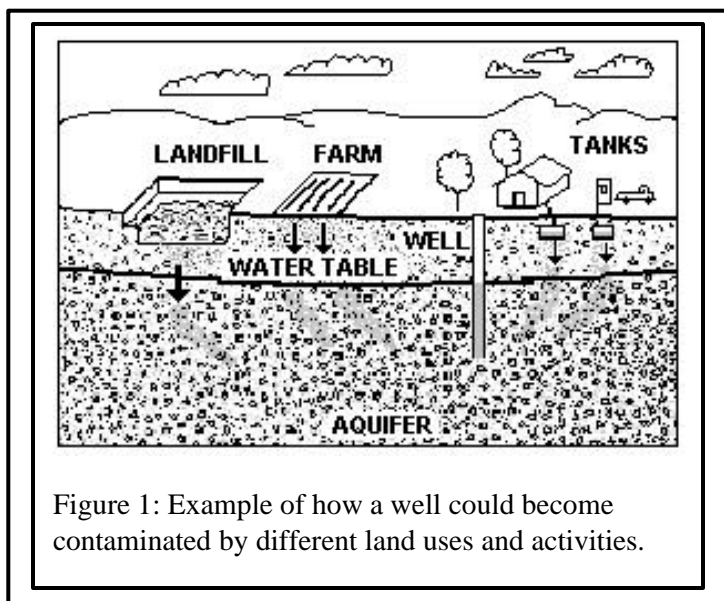
#### Key issues include:

1. **Non-conforming Zone I,**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Yes	Moderate	Supply BMPs to residents
Agricultural activities	Yes	Yes	Moderate /High	Refer commercial farmers to NRCS for assistance, as needed. Supply hobby farmers with information about BMPs.
Septic components	No	Yes	Moderate	Supply BMPs to residents.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



2. **Transportation corridor,**
3. **Residential land use, and**
4. **Agricultural uses.**

The overall ranking of susceptibility to contamination for the Colrain Fire District #1 supply well (02G) is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The District owns the Zone I west of the river but does not own the Zone I east of the North River. The Zone I land across the river is presently forest. Only hay is grown in the field within the Zone I west of the river.

#### **Zone I Recommendations:**

- V Monitor proposed activities east of the river and consider acquiring Zone I through ownership or land use controls. Consider purchasing a Conservation Restriction or entering into an agreement for Right-of-First Refusal if there appears to be a potential for development of the land. Continue to control access to the wellhead area.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- V Continue to prohibit the use and storage of pesticides, fertilizers or manure within the Zone I.

**2. Residential Land Use** – There are several residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### **Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor** – The well is located on State Route 112. The greatest threat from the road is deicing materials, an accidental spill and or illegal access.

#### **Transportation corridor Recommendations:**

- V Work with the Town/State to ensure that road runoff is directed where feasible, to an area downgradient (south) of the well.
- V Prepare an Emergency Response Plan that includes coordination between the DEP, the Fire District, the Town, MA highway and State Police in the event of an accident near the wellhead.
- V Consider fencing the area if access becomes an issue in the future.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

**4. Agricultural Activities** – The protection areas include a large percentage, approximately 40%, of land for agricultural activities. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Frequently, farms and golf courses have maintenance garages for equipment and storage tanks.

### Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Call the local office of the NRCS in Greenfield for assistance or refer to the fact sheets available online at the website <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Continue your current work with farmers, and include hobby farmers, to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available that is available online at the NRCS website: <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. Call the local office of the NRCS for assistance. The Colrain highway superintendent may find this information useful.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer hobby farmers and interested parties to the following websites for additional information: <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual>.

## 5. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The water supplier should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- V Continue efforts to control access to Zone I and monitor activities in the IWPA area.
- V Consider having the Zone II for the well delineated so that protection can be focused in areas that are within the actual contribution area of the well.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### **Zone I:**

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Inspect drainage within the Zone I and monitor the stability of the riverbank regularly.
- ✓ Continue your current practice of prohibiting the use of pesticides, fertilizers or spreading of manure within the Zone I.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- ✓ Consider investing in the delineation of a Zone II contribution area to improve protection planning for the well. This same recommendation was made to the

Griswoldville water supplier. In the meantime, work with local planning and Board of Health officials in Colrain to develop Aquifer Protection District Bylaws and to include the Colrain supply IWPA in that district. Work with the Shelburne and Griswoldville water suppliers to request protection planning in Colrain.

- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Colrain Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
January 6, 2004

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Colrain Elementary School
<i>PWS Address</i>	22 Jackson Street
<i>City/Town</i>	Colrain, Massachusetts
<i>PWS ID Number</i>	1066004
<i>Local Contact</i>	Mr. Dann M. Emerson
<i>Phone Number</i>	413-624-3451

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1066004-01G	146	445	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Colrain Elementary School (the school) is located approximately in the center of Colrain, on Route 112. Colrain is a small rural town in northwestern Massachusetts on the Vermont border. The total school student and staff population is approximately 235 people per day. Although there are two public water supply systems in Colrain, and a wastewater treatment facility, neither of water systems serves the school nor does the wastewater facility serve this area of town. Therefore, the school is served by one potable supply well (Well #1) and disposes of its wastewater through an on-site septic system.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The Zone I is the area immediately around the well where only activities associated with supplying water or non-threatening activities are allowed. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The school's well has a Zone I protective radius of 146 feet and an IWPA protective radius of 445 feet. These protective radii were based on the withdrawal rate approved following a pumping test conducted on the well in 1995. The Zone I area for the well is not conforming to current DEP requirements. The Zone I area for Well #1 includes most of the school building and approximately 25 parking spaces. The IWPA includes the remaining sections of the school, the fuel oil underground storage tank (UST) and all of the septic system components including tanks and leachfield. Refer to the attached map that shows the Zone I and IWPA.

In 1995, the school was renovated and expanded. Site constraints prohibited development of a new source at the school and because the water quality for the existing well was not impaired by activities near the well, the DEP allowed the school to continue utilizing the existing well following a pumping test and analysis. During reconstruction, the septic system and the underground fuel oil storage tank were upgraded and located outside of the Zone I. The well is an 8-inch diameter, approximately 300 feet deep bedrock well, located within the basement of the oldest section of the school near the west wall.

The school is located in the narrow river valley of the East Branch of North River. Geologic mapping of the area indicates overburden deposits of less than 50 feet of sand with some amount of till over bedrock. The surficial deposits in the area are sand and

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Yes	High	UST w/leak detection at school
Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields.
School facilities	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential and hobby farming/animals	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel and manure management
Transportation Corridor/parking	No	Yes	Moderate	Jacksonville Road (Rt. 112) and school parking
Septic systems components	No	Yes	Moderate	School septic system in the IWPA
Transformers	No	Both	Low	Monitor transformers for potential leaks

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

gravel that was likely deposited during the recession of the glaciers some 14,000 to 18,000 years ago. Streams and rivers have reworked the stratified drift and deposited additional alluvium. The bedrock in the area is mapped as quartz mica schist with interbeds of quartzite and marble of the Conway Formation.

There is no evidence of a continuous, protective confining layer in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water from the well does not require treatment prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tank;**
3. **School facilities and athletic fields; and**
4. **Transportation corridors and parking.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

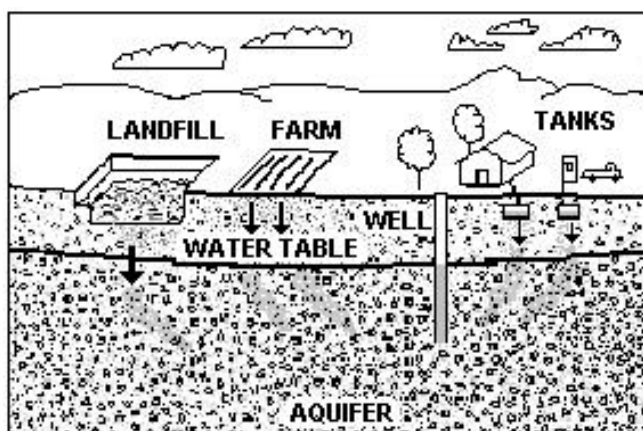


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. During the 1995 school expansion, the DEP approved the use of the existing well due to site constraints and good water quality from the existing well.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling household hazardous chemicals and site maintenance.
- ✓ Monitor all fuel oil deliveries and parking areas.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prohibit the use or storage of any hazardous materials near the well. Inspect the well regularly to ensure the cap is secure.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

**2. Underground fuel oil storage** – There is one fuel oil UST located within the IWPA. If managed improperly, fuel oil tanks and their associated fuel lines can be a potential source of contamination due to leaks or spills of the materials they store. The fuel lines are sleeved and graded to drain back to the tank.

#### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site.

**3. School facilities and athletic fields** – Elementary schools generally use only household type hazardous materials. There are state and federal controls on some activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. Storm drains in the parking areas at the school drain directly into the ground.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review the handling of laboratory wastes to determine if a tight tank is appropriate.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Association's Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**4. Residential Land Use** – There are a few rural residences within the IWPA protection area. One home adjacent to the school has horses (hobby farming). There are also residences across the river from the school that are within the IWPA. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks,

maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- V Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**5. Transportation corridor** – Route 112 along with the access and parking areas for the facility are located within the Zone I and IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. Parking lot storm runoff is discharged through infiltration catch basins.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination among the emergency responders to be sure they are aware of the location of your well.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I and the relocation of the UST and septic system during reconstruction.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- V Monitor all activities associated with the fuel oil, especially delivery.

**Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Consider relocating the well if water quality is impacted by activities near the well.
- V Post drinking water supply signs in key locations, such as, along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

**Training and Education/Facilities Management:**

- V Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and the certified operator.
- V In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document “A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE” and consider registering to participate if it is appropriate.

**Planning:**

- V Work with local officials to develop an Aquifer Protection District and Bylaws that includes the school well’s IWPA along with other water supply protection areas in town and to assist you in continued protection of the water supply.

- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
BAKER'S COUNTRY STORE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Baker's Country Store
<i>PWS Address</i>	101 River St.
<i>City/Town</i>	Conway, Massachusetts
<i>PWS ID Number</i>	1068003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1068003-01G	100	402	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

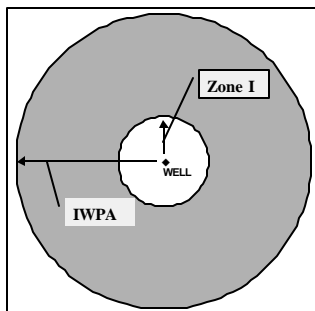
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1068003-01G)**

Zone I = 100 ft.  
IWPA = 402 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on septic system comp, a tight tank and several leachfields within the Zone I and/or the IWPA of the well. The **high** susceptibility to potential non-microbial threats is based on storage of hazardous materials such as gasoline and the underground storage tanks for gasoline and diesel within the Zone I and IWPA as well as local roads and parking.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information you submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
HOLLY'S BARN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Holly's Barn
<i>PWS Address</i>	176 South Deerfield Road
<i>City/Town</i>	Conway, Massachusetts
<i>PWS ID Number</i>	1068004

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1068004-01G	148	447	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

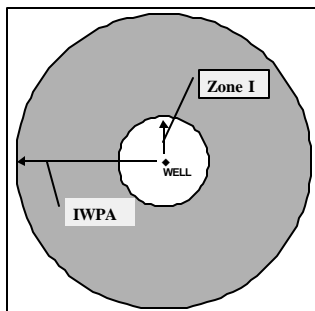
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1068004-01G)**

Zone I = 148 ft.  
IWPA = 447 ft.



## How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Source Water Assessment Program (SWAP) Report

## For

### Conway Grammar School



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 11, 2000

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Conway Grammar School
<i>PWS Address</i>	24 Fournier Road
<i>City/Town</i>	Conway, Massachusetts
<i>PWS ID Number</i>	1068006
<i>Local Contact</i>	Principal, Ms. Judith Siciliano
<i>Phone Number</i>	413-369-4239

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1068006-01G	195	496	Moderate

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

#### Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting or storage, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to you or your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attached Map of the Protection Areas
5. Appendices

## 1. DESCRIPTION OF THE WATER SYSTEM

#### Well #1

The Conway Grammar School has a total staff and student population of approximately 240 people and is located in a rural setting surrounded primarily by woodland, rural and agricultural land uses. The well for the Conway Grammar School is located on a wooded parcel of land, approximately 150 feet south of a former ice pond, 300 feet north of a farmhouse and approximately 800 feet north of South Deerfield Road (State Route 116). The Zone I radius for Well #1 is 194 feet and the Interim Wellhead Protection Area (IWPA) radius is 496 feet. The well was developed and tested under the DEP's New Source Approval Process in 1990 at a pumping rate of 4 gallons per minute (gpm). The Zone I and IWPA protective radii are based on the well's approved safe yield of 3 gpm (4,320 gallons per day). Please refer to the attached map that shows the Zone I and IWPA.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 is a 6-inch diameter drilled well with steel casing grouted to 33 feet below ground. Geologic mapping of the area indicates the bedrock is garnetiferous, quartz-mica schist of the Conway Formation. Bedrock was encountered 9 feet below grade and the boring was advanced to 545 feet below ground with the pump set at approximately 500 feet. The driller recorded water-bearing fractures from 380 to 440 feet below grade and under static (non-pumping condition) water freely flowed out of the top of the casing. Therefore, during well completion, the ground level around the well was raised with fill and the casing was extended approximately 3 feet above the ground. A casing drain was installed approximately 4 feet below ground to keep water in the well from freezing during the winter. When the well pump is off, water flows freely to a nearby brook.

During the site visit, bedrock outcrops were observed immediately adjacent to the well and throughout the parcel. This confirms that the bedrock is shallow, with little or no hydrogeologic barrier between the ground surface and the bedrock aquifer. Bedrock wells drilled in these conditions are considered to be highly vulnerable to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the ground surface.

### Water Quality

The water quality from well #1 currently meets all US Environmental Protection Agency and Massachusetts Department of Environmental Protection drinking water standards. The Conway School well water does not require and does not have treatment at this time. For current information on monitoring results, please contact the Principal, Ms. Judith Siciliano listed above.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. Please refer to Table 2.

Key issues include:

1. The Town's Salt Shed and dirt-floored barn used for storage,
2. Stockpiled clean soil and crushed asphalt within the IWPA,
3. Residential and recreational uses within IWPA.

Although there are no activities within the Zone I, the overall susceptibility ranking of the well to contamination is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA.

**Table 2: Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Highway Department	Salt Shed and former cow barn	No	Yes	Moderate	Dirt-floored former cow barn is being used for equipment storage. Potential threat from hydraulic/petroleum fluids and other materials that may be stored there.
	Stockpiled cut asphalt/soil	No	Yes	Moderate	Approximately 200 – 300 c.y. of crushed asphalt and dirt were stockpiled.
Residential	Two Residences with barn and non-commercial farm animals	No	Yes	Moderate	See septic system, pesticide and manure brochures in the appendix.
School	Athletic Field	No	Yes	Moderate	Continue policy of no fertilizer or pesticide usage. Include in landscaper's contract.
	Transformer	No	Yes	Low	Due to the age of the transformer, it likely does not contain PCBs. However, contact your utility company to confirm.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

1. Town's Salt Shed – The aerial photograph (map) attached to this report was taken in 1997. It is our understanding that the shed was constructed in 1999 and therefore does not appear on the photograph. However the former cow barn and farmhouse do appear on the photo. The cow barn is shown on the map under the 3 of the number "13" shown within the blue circle outlining the IWPA. The new salt shed is located immediately north of the former cow barn.

Please note that the 1998 Sanitary Survey states explicitly that the Department must be informed prior to conducting activities within the Zone I or IWPA. The Town did receive verbal approval from the Department to construct the salt shed. Although the salt shed is covered and the tarmac is paved, there is no drainage control from the facility, which could result in ponding of water at the site. In addition, the Town is utilizing the former cow barn for storage. The floor of the old barn is dirt and currently the Town is storing the truck sander bodies and tires in the barn along with miscellaneous items. The potential threats from these items are release of hydraulic fluid from the sanders, the potential release of petroleum products from motor vehicles utilizing the facility, as well as motor oils stored there and used to maintain those vehicles. The relatively thin soil does not provide a significant barrier to prevent potential contaminants from entering the bedrock aquifer utilized by the school's well, therefore, careful consideration must be made of the activities conducted within the IWPA. The Town must prohibit activities within the IWPA that pose a significant threat to the public water supply and use Best Management Practices and controls for those activities that will be allowed in this area. No activities may take place in the Zone I that are not directly related to the Public Water Supply.

2. Stockpiled soil and crushed asphalt – Approximately 200 to 300 cubic yards of clean fill, top soil, and crushed asphalt were stockpiled within the IWPA of the school well. The material is located just outside of the Zone I beginning approximately 248 feet from the well. Asphalt and other recyclable materials are considered to pose a moderate threat. The piles of dirt and asphalt also do not appear on the map but were observed immediately north and slightly east of the new salt shed.

The Department can offer technical assistance to the Town to determine what types of activities should be prohibited within the IWPA and the Best Management Practices that should be employed for those activities that will be conducted on Town property within the IWPA.

3. Residential and recreational land uses within the IWPA include recreation horses, normal household activities and a snow mobile trail. In general, normal residential activities pose some threat to public and private water supplies. Use of best management practices minimizes the threat to both private and public wells. Judicious use of pesticides, petroleum products, maintenance of septic systems and animal manure management will protect both the public and private residential; water supplies.

Implementing the following recommendations will help minimize the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

The Conway Grammar School and Town of Conway should review and adopt the following recommendations at the school:

### Zone I and IWPA:

- ✓ Remove or manage all potentially hazardous materials within the IWPA including the asphalt, petroleum products or

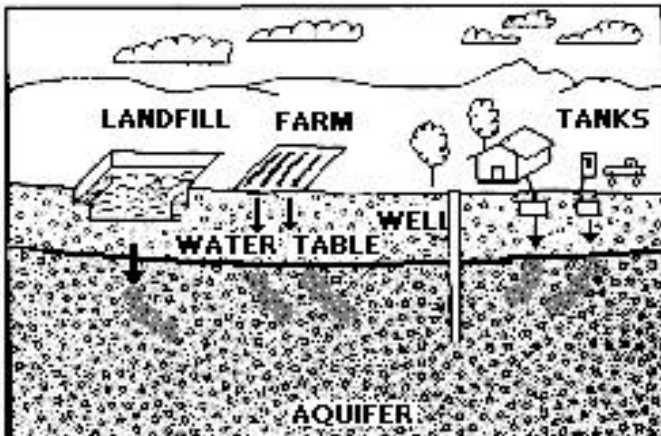


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### **For More Information:**

Contact Catherine V. Skiba at DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

equipment containing petroleum products.

- ✓ Contain or control all materials that could pose a potential hazard to public water supplies.
- ✓ If the Town intends to continue utilizing the cow barn, seal the floor and restrict (control) activities that could pose a threat to the water supply.
- ✓ Control the runoff from the salt shed road and parking lot to prevent ponding.
- ✓ Work with the Selectmen, Board of Health and Planning Board to manage activities within the IWPA. Due to the vulnerability of the bedrock aquifer, it is imperative that the Town and school carefully consider activities proposed for the IWPA. Refer to the Wellhead Protection Plan guidance and the model bylaws for types of activities that should be prohibited and controlled in the vicinity of a public or private water supplies.
- ✓ Post drinking water protection area signs at key visibility locations of the Zone I.
- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA. Look for illegal dumping and evidence of vandalism.
- ✓ Do not use or store hazardous materials within Zone I.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, storage, use, disposal, emergency response, and best management practices. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training.

- ✓ Arrange to have hazardous materials disposal available for the school staff, primarily the custodial staff, either through the Town's hazardous waste collection days or through other means. The school may have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials.
- ✓ Incorporate groundwater education into the school's curriculum (K- Grade 6 curricula available from DEP; DEP can suggest other agencies' curricula as well).

### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, handling, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/brp/dws/dwspubs.html](http://www.state.ma.us/dep/brp/dws/dwspubs.html) and [www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm](http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm). Also contact Hillary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us).
- ✓ Septic system components should be inspected and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- ✓ Work with local officials in Conway to inform them of the significance of the school's IWPA so they may assist you in improving and maintaining protection of the school's water supply.
- ✓ Contact the Department for guidance regarding any further development of activities within the IWPA.
- ✓ It is recommended that the Town consider zoning bylaws to protect the public water supply areas within the community. Refer to the Department's model bylaws for examples of activities that should be prohibited within the Wellhead Protection Areas and those that should be restricted or controlled. Utilize BMPs where appropriate.
- ✓ Prepare a Wellhead Protection Plan and Emergency Response Plan to address short-term water shortages, long-term water demands and management. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional, new information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Financial:**

- ✓ The Conway Grammar School is eligible to apply for Wellhead Protection and Source Water Protection Technical Assistance Grants under the State Revolving Funds (SRF) program. An announcement for the Grant programs is attached to this report

and Department personnel are available to assist you through the grant application process. Preparation of a wellhead protection plan and preparation of Town protective bylaws are types of eligible projects

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**Attachment:**

- ◆ Map of the Public Water Supply (PWS) Protection Area.
- ◆ Septic System Brochure
- ◆ Making Wellhead Protection Work in Massachusetts
- ◆ Developing a Local Wellhead Protection Plan
- ◆ Bureau of Waste Prevention, Division of Solid Waste policies  
Guide to Regulations for Using or Processing Asphalt, Brick and Concrete Rubble

**Additional Reference Documents:**

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- ◆ Water Supply Protection Guidance Materials such as model regulations,
- ◆ Best Management Practice information, and general water supply protection information.
- ◆ MA DEP SWAP Strategy
- ◆ Land Use Pollution Potential Matrix
- ◆ Draft Land/Associated Contaminants Matrix

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
CONWAY SCHOOL OF LANDSCAPE DESIGN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 24, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Conway School of Landscape Design
<i>PWS Address</i>	322 South Deerfield Street
<i>City/Town</i>	Conway, Massachusetts
<i>PWS ID Number</i>	1068009

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1068009-01G	100	406	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

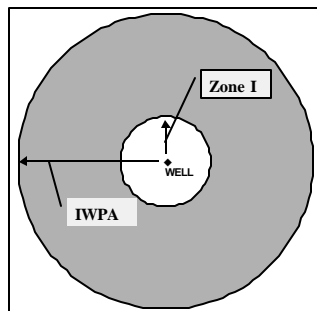
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1068009-01G)**

Zone I = 100 ft.  
IWPA = 406 ft.



### How was my Well's Susceptibility Determined?

Your well's **moderate** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you during the development of the new facility, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment and Protection (SWAP) Report for Cummington Water Department

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
August 20, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Cummington Water Department</b>
<b>PWS Address</b>	<b>Cummington</b>
<b>City/Town</b>	<b>Cummington, Massachusetts</b>
<b>PWS ID Number</b>	<b>1069001</b>
<b>Local Contact</b>	<b>Donna Forgea</b>
<b>Phone Number</b>	<b>413-634-5358</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #3	1069001-03G	202 (radius)	507	High

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>MA GIS Zone II</b>	<b>Source Susceptibility</b>
Fanny Rogers Spring	1069001-04G	518 (square)	ID # 587	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Cummington is a small rural residential community located in the foothills of the Berkshires in western Massachusetts. The Cummington Water Department has 76 service connections in the center of the small community that serves residential homes, municipal buildings including the school, and several businesses. The water system

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

serves a total population of approximately 480 people. Well 03G, the main water supply source is a 50-foot deep, 10 x 18-inch diameter gravel packed well, located within the floodplain of the Westfield River, installed in August 1988. The source was approved through the New Source Approval Process for a withdrawal rate of 50 gallons per minute. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 379 feet and 2,000 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the recharge area has not been delineated. A Zone II, the actual recharge area has not been delineated for Well #3. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The Water Department also has a spring source, Fanny Rodgers Spring (04G). The Spring (04G) consists of two cisterns that flow by gravity to a third cistern that are all located within close proximity of each other. Water may then flow by gravity into the distribution system or is bypassed to waste. The spring water has received a low vulnerability rating through two rounds of Microscopic Particulate Analysis indicating the source is not significantly influenced by surface water. Although the spring water is regularly monitored for quality, the source remains active primarily as a back-up source because of the natural corrosivity of the water. If the Water Department intends to increase use of the spring system, it will be required to adjust the pH of the water for corrosion control to minimize the potential leaching of copper and lead from plumbing fixtures.

As part of the SWAP program, the United States Geological Survey (U.S.G.S.) was retained by the MA DEP to estimate the contributing area to public water supply springs through the use of geologic mapping. The U.S.G.S. determined the discharge from the springs by a combination of flow measurement and estimation of recharge, thereby estimating the maximum anticipated flow rate from the springs. The springs are located in a wooded area at the base of a slope. The Zone I and Zone II were based on an estimated maximum flow rate of 8 gallons per minute (gpm) from the spring system. The Zone I for a spring is a square oriented so that the sides of the box are parallel to groundwater flow. The spring is centered relative to the sides of the box and 50 feet upgradient of the downgradient edge of the box. For a flow rate of 8 gpm, the Zone I for the springs is a box with sides 518 feet in length.

Bedrock Well #1 (01G), located at the north end of the Main Street, is designated as an Emergency source of water. The well does not have a pump installed and all piping has

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	Both	--	--	PWS does no own Zone I, non-conforming uses
Hazardous materials storage and use	Well #3	Well #3	High	Conduct inspections of facilities, encourage the use of BMPs and regulatory compliance. Coordination with emergency responders.
Auto repair garages	No	Well #3	Moderate	Hazardous materials/VSQG
High density residential w/septic	Well #3	Both	Moderate	Use BMPs for household hazardous waste, heating fuel, septic system management, and lawn care and stormwater runoff.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	--	Well #3	Moderate /High	Use BMPs for household hazardous waste, septic system management, lawn care and stormwater runoff. Investigate fuel source at the school and inspect the boiler room for floor drains and their discharge point.
Highway Department garage, USTs and Closed Landfill	--	Well #3	High	Hazardous materials storage/VSQG and leaks and overfills of USTs, landfill leachate
Electric utility storage facility	--	Well #3	Moderate	Transformers, vehicles, etc.
Transportation corridor: local roads and State Route 9	Well #3	Both Sources	Moderate	Limit road salt usage and provide drainage downgradient from wells
Agricultural uses – pesticide, fertilizers, manure spreading	Well #3	Both Sources	High	Activities include haying, corn crop, and a dairy farm. Potential threats from pesticides, nutrients, petroleum products and microbial contaminants.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

been severed from the distribution system. Bedrock well #2 (02G) was located in the town garage and was abandoned and decommissioned several years ago. Wells #1 and #2 will not be address further in this report.

Bedrock in the area is mapped as the Goshen Formation consisting of two distinct units: one is interbedded quartzite and schist; the other is interbedded schist and phyllite. The springs are located at the base of a hill in a swampy area with an unknown thickness of peat. The recharge area is generally an upland area that is dominated by exposed bedrock or bedrock covered with a varying thickness of till (hardpan). Recharge to the springs is through the till and schist. The contributing area to the springs includes hay fields, cornfields, a few residences and a rural road. Due to the exposed bedrock and thin till, the springs are considered to have a high vulnerability to potential contamination from activities conducted on the land surface in the recharge area because of the lack of a protective barrier such as clay. Please refer to the attached map of the Zone I and Zone II for the spring.

As previously noted, Well #3 is located within the Westfield River valley, which is a narrow, buried bedrock valley, filled with glacially derived stratified drift (sand and gravel) and recent alluvial deposits. The aquifer is an unconfined sand and gravel deposit adjacent to the Westfield River; there is no record of a confining, protective clay layer in the vicinity of the well. Wells located in this type of geologic condition are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. The Town of Cummington has established an Aquifer Protection District and adopted protective Zoning Bylaws for that area. The Zone I and IWPA include much of the Main Street of Cummington, including a baseball field, municipal buildings, agricultural, commercial and residential uses as well as Route 9. Cummington does not have a municipal wastewater treatment plant and therefore all facilities dispose of wastewater through on-site septic disposal systems. Please refer to the attached map of the Zone I and IWPA.

For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

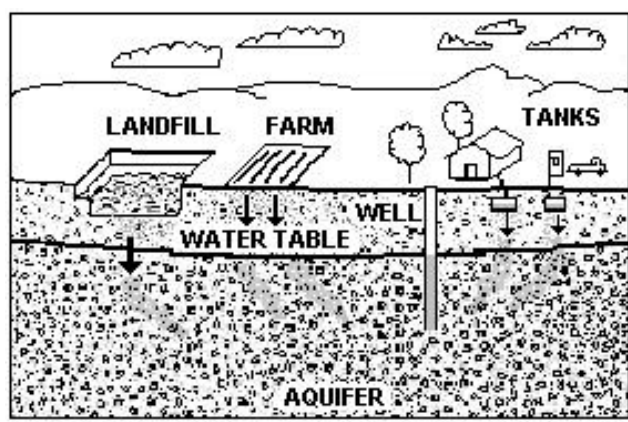


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #3 (03G) include the entire town center for Cummington, which includes several activities that pose a threat water supply. The recharge area for the Fanny Rodgers Spring (04G) source includes agriculture and residential uses.

### Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential/commercial land uses with on-site septic disposal**
3. **Transportation corridors,**
4. **Hazardous materials handling,**
5. **Agricultural uses,**
6. **Protection Planning.**

The overall ranking of susceptibility to contamination for the Cummington Water Department system is high, based on the presence of several high threat ranked land uses or activities in the Zone I, IWPA and Zone II. Please refer to Table 2 for more details.

The Town of Cummington is commended for adopting protective bylaws and for the Water Department's diligence in monitoring activities within the Zone I and IWPA. Continued monitoring and public outreach is recommended to prevent accidents and minimize threats within the protection areas of the wellhead and continue to pursue Zone I acquisition options.

**1. Non-conforming activities within Zone I** – Currently, the water supplier does not own or control the entire Zone I area for either source. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I for Well #3 includes a baseball field, fire station, hardware store, a cornfield, the river, part of a dairy farm across the river and part of Main Street; the Zone I for the Fanny Rogers Spring includes a portion of a cornfield.

### Recommendations:

- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- ✓ Agreement Options - Until land is available for acquisition or preservation, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
  - A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system, the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.
  - A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. A reference for a Right of First Refusal is included in the Appendices.
  - A Conservation Restriction is also a legal document that limits the type of activities that can be conducted on the property to those associated that do not pose a significant threat to the water supply.
- ✓ Where it is feasible, remove all hazardous materials from the Zone I of Well #3. Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals, maintenance chemicals and vehicles used to access the area.
- ✓ Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.
- ✓ Ensure that residents and commercial facilities are aware of best management practices (BMPs) with respect to hazardous materials handling, household hazardous materials handling and disposal and proper use of lawn chemicals.
- ✓ Carefully monitor the delivery, handling and storage of chemicals and products at facilities within the Zone I.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

**2. Residential Land Uses** – The Zone I and IWPA for Well #3 has high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridors** – Numerous roads are located within the Zone I, IWPA and Zone II. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

### Recommendations:

- V Work with the State Highway Department and the Town Highway Department to determine the location and discharge points of road runoff as is feasible. If reasonable, discharge stormwater to discharge downgradient of the well.
- V Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). For more information, call the local office in Hadley at 413-585-1000 or visit the U.S.D.A. web site at [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov). Fact sheets are also available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- V Prepare an Emergency Response Plan that includes coordination between the DEP, the Water Department the Town and State Police in the event of an accident near the wellhead.

**4. Hazardous Materials Storage and Use** – There are a few commercial, municipal and utility facilities within the protection areas of Well #3 that store or utilize hazardous materials. Many businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials. If hazardous materials are

improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

### Hazardous Materials Storage and Use Recommendations:

- V Educate local businesses and municipal departments regarding the use of best management practices for protecting water supplies. Distribute the fact sheets “Businesses Protect Drinking Water” and “DPWs Protect Drinking Water” available in Appendix A; it is also available online at the website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common business issues.
- V Work with the local Board of Health, the municipality and businesses to register facilities that are unregistered generators

of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- V Educate local businesses and town officials and assist the Board of Health in understanding the Massachusetts and local floordrain requirements. See the brochure “Industrial Floor Drains” for more information.
- V The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site at <http://search.sc.egov.usda.gov/>. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call the local office in Hadley at 413-585-1000.

**5. Agricultural Activities** – A small percentage, of the IWPA and most of the Zone II areas are in agricultural land use. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. Frequently, farms and other large commercial facilities have maintenance garages for equipment and storage tanks. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the products they store.

**Agricultural Activities Recommendations:**

- V Inform commercial farmers in your protection areas of your water supply protection area and encourage them to work with (or continue working with) the USDA Natural Resources Conservation Service (NRCS) and to have a farm plan to protect water supplies. Recommend that water suppliers and farmers review the fact sheets available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Hadley at 413-585-1000, for assistance as is appropriate.
- V Encourage farmers and any large commercial property owners to incorporate an Integrated Pest Management (IPM) approach into their pest (plant and insect) management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment. The Department of Agricultural Resources regulates the use of pesticides.
- V Very often farms and large commercial properties store maintenance equipment and associated petroleum products on site. Promote the use of BMPs for fuel storage, hazardous material handling, storage, disposal, and emergency response planning.
- V Consider providing hobby farmers with information about protecting their own wells and the public water supply by encouraging the use of BMPs. For additional resources, refer to [http://www.state.ma.us/dep/brp/dws/dws\\_pubs.htm](http://www.state.ma.us/dep/brp/dws/dws_pubs.htm) and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual>. The Planning Board, Board of Health and Conservation Commission may be able to provide information on BMPs to hobby farmers as well.

**6. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Cummington does have a protective bylaw that includes part of the Town center area. Cummington also was awarded a Wellhead Protection Grant to prepare a protection plan for the community. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

**Protection Planning Recommendations:**

- V Prepare a Wellhead Protection Plan and establish a protection team. Refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan” and continue current efforts in wellhead protection planning.
- V For long term planning, the Water Department may wish to consider having the Zone II delineated for Well #3 to assist in focusing protection efforts. Perhaps, the Department can collaborate with the West Cummington Department to have Conceptual Zone II delineations completed for both systems’ wells.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The West Cummington Water Department should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- V Continue efforts to acquire ownership or control of Zone I and limit access to the well.
- V Consider having the Zone II delineated for Well #3 to focus protection measures on areas that contribute directly to the well.
- V Continue to conduct detailed inspections of the IWPA to monitor activities near the well.

**Zone I:**

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use BMPs within the Zone I for treatment chemicals and
- ✓ Prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities, a Memorandum of Understanding or a Right of First Refusal to purchase the property.
- ✓ Redirect road drainage in the Zone I away from well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Keep the area near transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in Cummington to review Aquifer Protection District Bylaws for compliance with 310 CMR 22.000 and to include the West Cummington supply IWPA in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓ Work with the Board of Health to adopt floor drain regulations and hazardous materials handling regulations. Include an inspection program for facilities that handle hazardous materials.
- ✓ Have the highway department review their status as a hazardous waste generator and register as appropriate.

**Funding:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheets
- List of Regulated facilities in the protection areas

## ATTACHMENT

### REGULATED FACILITIES WITHIN OR IMMEDIATELY ADJACENT TO THE WATER SUPPLY PROTECTION AREAS

#### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Cummington Garage	Main Street	Cummington	Hazardous Waste Generator	Very Small Hazardous Waste Generator	Auto Repair
	Western Mass. Electric Co.	Fairgrounds Road	Cummington	Hazardous Waste Generator / Waste Oil	Very Small Hazardous Waste Generator	Electric Utility Maintenance / Storage Facility

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

#### Underground Storage Tanks in are adjacent to protection areas

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Town Garage	Fairgrounds Road	Cummington	DPW	2 Wall	Interstitial Monitoring	2,000	Gasoline
				2 Wall	Interstitial Monitoring	2,000	Diesel



# Source Water Assessment Program (SWAP) Report For West Cummington Water Department

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 5, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>West Cummington Water Department</b>
<b>PWS Address</b>	<b>West Cummington</b>
<b>City/Town</b>	<b>Cummington, Massachusetts</b>
<b>PWS ID Number</b>	<b>1069002</b>
<b>Local Contact</b>	<b>Donna Forgea</b>
<b>Phone Number</b>	<b>413-634-5358</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #2	1069002-02G	202	507	Low

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The West Cummington Water Department serves 26 homes in a small section of the rural community of West Cummington. The community is served by on-site septic disposal systems. Well 02G is a replacement well installed in November 2000 and is a 38-foot deep, 8 x 12-inch diameter gravel packed well. Although the source has a safe yield in excess of 30-gallons per minute, the approved withdrawal rate for the well is 3.33 gallons per minute based on existing historical demand of the system. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 202 feet and 507 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well is located within an unconfined sand and gravel deposit adjacent to the Westfield River. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

Potassium hydroxide is added to the water supply to adjust the pH for corrosion control. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few potential sources of contamination within the drinking water supply protection areas.

### Key issues include:

1. **Zone I ownership; and**
2. **Transportation corridor.**

The overall ranking of susceptibility to contamination for the well is low, based on the presence of few threatening land uses or activities in the Zone I and IWPA, as seen in Table 2. However, since the aquifer is vulnerable, diligence should be maintained to prevent accidents and monitor activities in the vicinity of the wellhead.

**1. Zone I ownership** – Currently, the water supplier does not own or control the entire Zone I area. Please note that systems not meeting DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. Although the map indicates the field adjacent to well is “cropland”, this area is an abandoned field that contains only the motor control building and the treatment facilities for the water supply. A small portion of the Zone I extends across the river and includes the access to the abutters property. That property is utilized as a primitive camping area with a fixed campsite but no utilities. The field is an abandoned hayfield and is currently not utilized as cropland or pasture.

### Recommendations:

- V Continue efforts to acquire Zone I through ownership or land use controls. Control access to the wellhead area. Consider purchasing a Conservation Restriction or entering into an agreement for Right-of-First Refusal.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Structures and access	Yes	Yes	-	Water supply structures. Use BMPs. Control or prohibit access

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Use Best Management Practices (BMPs) for handling treatment chemicals and vehicles used to access the area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Transportation corridor** – The well access is along a rural residential road that is relatively lightly traveled. The greatest threat from the road is deicing materials and an accidental spill.

### Recommendations:

- ✓ Work with the Town to ensure that road runoff is directed as is feasible, to an area downgradient (southeast) of the well.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the Water Department the Town and State Police in the event of an accident near the wellhead.
- ✓ Limit access through the property and work to eliminate any right-of-way.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The West Cummington Water Department should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Continue in efforts to acquire ownership or control of Zone I and limit access.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use BMPs within the Zone I for treatment chemicals and
- ✓ Prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road drainage in the Zone I away from well area.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

### Planning:

- ✓ Work with local officials in Cummington to include the West Cummington supply IWPA in the Aquifer Protection District.
- ✓ Have a plan to address short-term water shortages and long-term water demands.

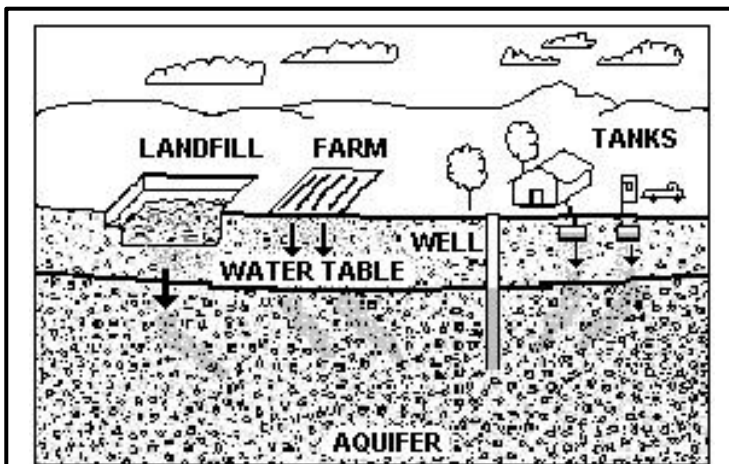


Figure 1: Example of how a well could become contaminated by different land uses and activities.

- V Keep the phone number of a bottled water company readily available in the event of an emergency.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response (grant application) for the Grant program (RFR) on or about May 1. The responses are generally due on or about July 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

Y:\SWPQRT\WERO\1069002 W Cummington



# Source Water Assessment Program (SWAP) Report For The Academy at Swift River

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 12, 2002

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>The Academy at Swift River</b>
<b>PWS Address</b>	<b>151 South Street</b>
<b>City/Town</b>	<b>Cummington, Massachusetts</b>
<b>PWS ID Number</b>	<b>1069003</b>
<b>Local Contact</b>	<b>Dennis Mimitz</b>
<b>Phone Number</b>	<b>413-634-0307</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1069003-01G	250	1240	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Academy at Swift River is a private, 14 month boarding school for students ranging in age from 13 to 18, located in the rural communities of Cummington and Plainfield. The facility is served by on-site septic disposal and a single water supply well #1 (01G). Well #1 is a 280-foot deep, 6-inch diameter, bedrock well. The Department approved well #1 in 1989, with a withdrawal rate of 26.25 gallons per minute; a maximum daily withdrawal of 37,800 gallons. However, actual water use at the school is significantly less than the approved withdrawal rate of the well. Therefore, the Department reduced the Zone I to 250 feet based on actual water use (10,000 gpd); the IWPA remains at the 1,240 based on the approved withdrawal rate of the well (37,800 gpd). The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The lodge, now a science classroom building, is located just outside of the Zone I at a distance of approximately 270 feet from the well. The school utilizes micro-pipette techniques and frozen biological specimens but does not have a tight tank for the laboratory wastewater discharge. Please note that the Title 5 regulations prohibit discharge of non-sanitary wastewater to a septic system. The facility uses propane for a heating fuel source. Although the main supply tank is north of the main building, other smaller tanks are located at remote buildings.

USGS maps the bedrock within the area as meta-sedimentary and meta-volcanic rocks with complex folding, resulting in steeply dipping, nearly vertical beds. Immediately at the well site the rock is mapped as quartzite schist of the Goshen Formation. The overburden is a relatively thin layer of till. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Non-conforming activities in Zone I;**
2. **School facilities.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School facilities	No	Yes	Moderate	School facilities within IWPA; household hazardous materials and waste
Septic System	No	Yes	Moderate	See Septic System Brochure
Laboratory waste to septic	No	No	Moderate	Contact Program Coordinator – Wastewater Program
Residential Use	No	Yes	Moderate	See Best Management Practices
Parking lots and transportation corridor	No	Yes	Moderate	Limit road salt usage and maintain drainage away from wells

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



The overall ranking of susceptibility to contamination for wells 2 and 3 is moderate, based on the presence of one or more moderate ranking land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Non-conforming activities in Zone I;** – The lodge, classroom building is located just outside of the Zone I of the well. The only activities within the Zone I are related to passive recreation and foot traffic through campus. The main foot pathway from the north buildings to the lodge/classroom building which has been in place for approximately 12 years was paved in 2001 to control erosion; there is no motor vehicle traffic on the pathway. It was also noted during the site visit that the well cap did not have a sanitary, watertight cap. DEP prohibits all activities not related directly to water supply within Zone I. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendations:**

- ✓ Prohibit any new non-water supply activities within the Zone I.
- ✓ Supply a watertight sanitary cap for the well.
- ✓ Do not use pesticides or fertilizers within the Zone I. Minimize sodium-based deicers within the Zone I.

**2. School facilities** – All of the school facilities are located within the IWPA of the well except the septic system leach field. The leach field is located outside of the IWPA and appears to be topographically cross gradient from the well site. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. The school should evaluate how laboratory wastes are treated and disposed; a tight tank may be required.

**Recommendations:**

- ✓ Use Best Management Practices for all activities at the school with respect to household hazardous materials and education of staff regarding septic system management.
- ✓ Contact Paul Nietupski, at 413-755-2218 the wastewater management program coordinator, regarding the laboratory wastewater management.
- ✓ Storage of hazardous materials (even household type hazardous materials) should be an impermeable surface and contained in an area large enough to hold 110% of the liquid volume, should a spill occur.
- ✓ Review the facility's status with respect to registration as a Very Small Quantity Generator of Hazardous Waste. Whether you are required to register or not, please

implement standard operating procedures regarding proper storage, use and disposal of hazardous hazardous materials. To learn more, refer to for the Requirements for Small Quantity Generators.

Another potential threat to the well within the IWPA noted during the site visit was the old shallow dug well near the main building. The dug well was partially covered at the time of the visit and the Department recommended decommissioning the well to prevent potential contamination of the shallow aquifer and to eliminate the physical hazard. The school is commended for having filled and properly decommissioning the well following the SWAP site visit.

Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters,

**Glossary**

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

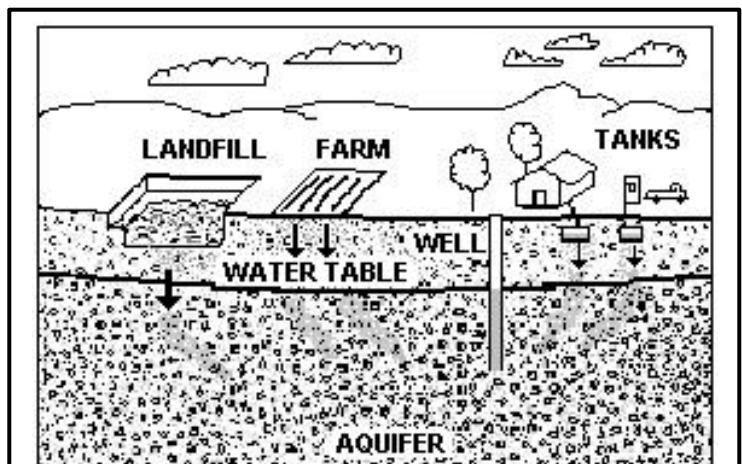


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. The drains are directed topographically downgradient of the well to an area on the edge of the IWPA. Monitor parking areas and inspect, maintain, and clean catch basins on a regular schedule. Please note that material cleaned out of catch basins is considered solid waste and must be disposed of in compliance with DEP policy. Residential uses also pose minimal threat to public and private water supplies provided septic systems and household hazardous materials are properly managed.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Swift River Academy water supply well is fairly well protected and the school is commended for conducting on-going protection measures. Please review and adopt the key recommendations above and the following to further protect the source:

### Priority Recommendations:

- ✓ Install a sanitary cap on the wellhead.
- ✓ Comply with non-sanitary wastewater disposal requirements.

### Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Continue to prohibit public access to the well and pumphouse by locking facilities, sealing all openings in the walls and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Maintain drinking water protection area signs at key visibility locations away from the well at the perimeter of protection areas.
- ✓ Incorporate groundwater education into school curriculum (contact DEP for copies of appropriate curricula as required).

### Facilities Management:

- ✓ The Academy at Swift River is not a registered Very Small Quantity Generator of Hazardous Waste. Review your status and determine compliance if required. Whether registration is required or not, implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to attachments and <http://www.state.ma.us/dep/consumer/consumer.htm> regarding management of household hazardous materials.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials such as science labs, discharge drains to a tight tank.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Protective pads around the wellhead should slope away from well casing.

### Planning:

- ✓ Work with local officials in Cummington and Plainfield to include the school's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.

- V Supply residential neighbors with assistance and information regarding proper management of household hazardous materials management.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Requirements for Small Quantity Generators of Hazardous Waste
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Residents Protect Drinking Water Fact Sheet

Y://swapqtr/wero/1069003

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For SHIRE VILLAGE CAMP



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 25, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Shire Village Camp
<i>PWS Address</i>	Mellor Rd
<i>City/Town</i>	Cummington, Massachusetts
<i>PWS ID Number</i>	1069009

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 (01G)	1069009-01G	107	427	High	Moderate
Well #2 (02G)	1069009-02G	158	454	High	Moderate
Well #3 (03G)	1069009-03G	107	427	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

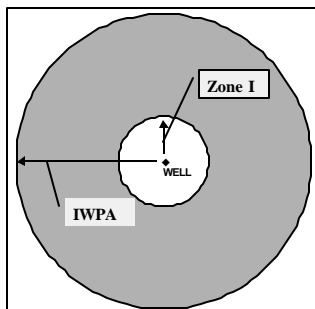
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for MAIN  
BUILDING WELL (01G)  
(1069009-01G)**

Zone I = 107 ft.  
IWPA = 427 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system and animals within the Zone I or the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the parking and other camping activities within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, a Sanitary Survey, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
COWGIRLS' REALTY TRUST, LLC



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Cowgirls' Realty Trust, LLC
<b>PWS Address</b>	445 Berkshire Trl
<b>City/Town</b>	Cummingtown, Massachusetts
<b>PWS ID Number</b>	1069010

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1069010-02G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

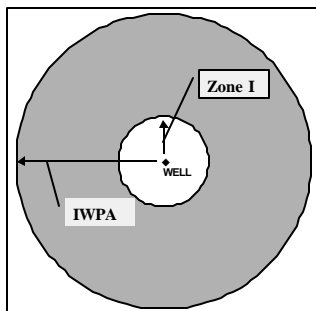
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1069010-02G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **high** susceptibility to potential non-microbial threats is based on the local roads, parking and underground storage of gasoline within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
CUMMINGTON FARM STAND



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Cummington Farm Stand
<i>PWS Address</i>	609B State Route 9
<i>City/Town</i>	Cummington, Massachusetts
<i>PWS ID Number</i>	1069011

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1069011-01G	100	422	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

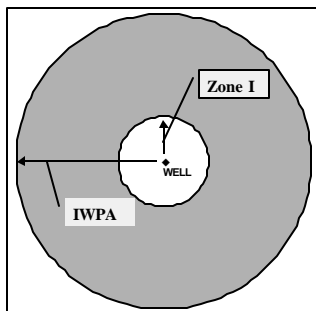
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1069011-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Dalton Fire District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Dalton Fire District
<i><b>PWS Address</b></i>	20 Flansburg Avenue
<i><b>City/Town</b></i>	Dalton
<i><b>PWS ID Number</b></i>	107000
<i><b>Local Contact</b></i>	Mr. Gilbert Rudd, Jr.
<i><b>Phone Number</b></i>	413-684-6124

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

A well or surface water supply's water supply protection area is the land area contributing water to the source where protection activities should be focused.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer defined by hydrogeologic studies that must be approved by DEP. For wells that have not had a scientifically delineated Zone II, an Interim Wellhead Protection Area (IWPA) is designated.

**The IWPA** is the larger area that is likely to contribute water to the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed.

## Section 1: Description of the Water System

### Groundwater Source

Well Name	Source ID	Susceptibility
Mobile Home Park Well	1070000-01G	Moderate

### Surface Water Sources

Source Name	Source ID	Susceptibility
Egypt Brook Reservoir	1070000-02S	Moderate
Windsor Reservoir	1070000-03S	High

Dalton is a small, rural community in western Massachusetts. The Dalton Fire District maintains three surface water sources (Windsor, Egypt, and Anthony Reservoirs) and one groundwater source (Trailer Park Well) for drinking water purposes. Additionally, Dalton receives 46 million gallons of water per month from the Pittsfield Water Department which diverts water from the Windsor Brook watershed.

The Windsor Reservoir, the main source of water for Dalton, is located just over the Dalton municipal boundary in Hinsdale and Windsor. Its watershed is within these towns and partially in the town of Peru. The Anthony and Egypt Reservoirs and their respective watersheds are located entirely within Dalton. The Anthony Brook headwall is maintained as an emergency source only and is not addressed further in this report. Water from the Windsor and Egypt brook Reservoirs is treated through a conventional filtration plant at the district's Reservoir Road Water Treatment Plant. The plant, capable of treating water from either or both reservoirs, utilizes a sedimentation basin followed by two slow sand filter beds. Following filtration the water is chlorinate for disinfection and the pH adjusted for corrosion control.

The well (1070000-01G) is located south of Route 9, where it was constructed in 1993 to serve a mobile home park nearby. The mobile home park is located so that treated reservoir water could not easily be supplied to the park, therefore a well was installed to supply the area. The trailer park well is a bedrock well, drilled to a depth of 440 feet, and has an approved safe yield of 15 gpm. The Zone I for the well is 300 feet, and the Interim Wellhead Protection Area (IWPA) is 880 feet, based on the approved safe yield rate. The well is drilled into the carbonate rocks of the Stockbridge Formation and water from the well is chlorinated prior to distribution.

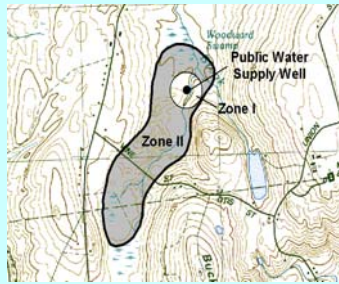
For current information on water quality monitoring results and treatment processes, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The land uses within the watershed of the Winsor Reservoir and the IWPA of the well are a mixture of agricultural, residential, and forests; there are numerous roads throughout. The watershed for Egypt Reservoir has only forested land with a utility right-of way. The most significant threat to the surface water supplies is from sediment and microbial threats from erosion, stormwater and

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II or IWPA protection area.



aquatic wildlife. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Tables of Regulated Facilities and Underground Storage Tanks attached in Appendix B.

#### Key Land Uses and Protection Issues include:

1. Nonconforming Zone A
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Protection Planning
6. Agricultural activities
7. Utility Right-of-way
8. Presence of Beavers in Surface Water Sources

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the main source, Windsor Reservoir water supply protection areas, as seen in Table 2. However, the sources (Egypt Reservoir and the Trailer park Well) have individual susceptibility rankings of moderate.

**1. Nonconforming Zone A** – The Zone I for the well is a 300-foot radius around the wellhead. The water supplier owns or controls all of Zone I. There is haying

conducted in the Zone I however, pesticides, fertilizers or manure may not be used on the field. The Zone A for reservoirs is 400 feet from the shoreline and 200 feet on either side of all feeder streams. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I/Zone A, or control the Zone I/Zone A through a mechanism such as a conservation restriction. Local roads run throughout the Zone A of Windsor Reservoir and the District does not own any of the land around Egypt Brook Reservoir. Only water supply activities are allowed in the Zone I/Zone A. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads.

#### Zone A Recommendations:

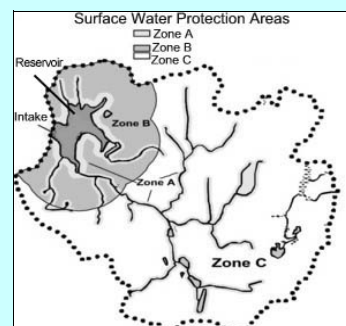
- ✓ Prepare a watershed/wellhead protection plan for all of the systems sources. Prioritize lands to protect within the Zone A, watershed and IWPA.
- ✓ Obtain a Right of First Refusal for acquiring land critical to protecting water supply within the Zone A.
- ✓ Consider purchasing the land or acquiring a conservation restriction on the land not owned by the District to minimize potential threats.
- ✓ Encourage the use of BMPs for the storage, use, and disposal of household hazardous materials and road runoff.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone A.
- ✓ Contact the property owners and the appropriate municipalities to be sure they are aware they are within the Zone A. Provide information and refer them to DEP if they require assistance implementing BMPs.
- ✓ Prepare a public access control plan including management, patrolling and monitoring.

**2. Residential Land Uses** – Approximately 13% of the IWPA consists of a high density residential areas. About 3% of the watershed of Windsor Reservoir has residential land use, including areas within the Zone A. None of the areas have public sewers; all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems provide a direct discharge to the ground. In addition, if septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.





- **Lawn Care and Landscaping** - Lawn care products can pose a significant threat to water supplies by leaching nutrients and pesticides into groundwater and surface water.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

### Residential Recommendations - Septic systems:

- ✓ **System Care** - Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal

practices, i.e. only sanitary waste in the septic system. Information on septic systems can be found at Massachusetts Department of Environmental Protection's website <http://www.state.ma.us/dep/brp/files/yoursyst.htm>.

- ✓ **Proper Disposal** - Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly - not in septic systems.

### Residential Recommendations - Lawn Care and Landscaping:

- ✓ **Environmentally Sound Lawn Care** - Provide educational materials to residents about the proper application of pesticides or fertilizers. Landscape with native grasses, native flowering plants and trees and shrubs. Once established native plants require less water and may not require fertilizer, herbicides or pesticides use. Encourage the use of native plants and landscaping by establishing a demonstration area at a town facility. Information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's website at <http://www.massdfa.org>.

### Residential Recommendations - Household Hazardous Waste:

- ✓ **Proper Disposal** - Educate residents on the problem of disposing of hazardous materials in landfills, septic systems, wastewater treatment plants, storm drains, and on the ground. Encourage residents to use the Town of Dalton's Household Hazardous Waste Collection opportunities. Consider working with the host communities and Berkshire Planning Commission to coordinate Household Hazardous Waste Collection days.
- ✓ **Alternative Products** - Provide residents with information on options that are available to substitute less hazardous substances for many products used in the home.

### Residential Recommendations - Heating Oil Tanks:

- ✓ **Inventory Tanks** - Work with host communities to inventory USTs. If there are significant numbers of tanks consider options for financial incentives to replace the tanks with ASTs.
- ✓ **Underground Storage Tanks** - Target homeowners with underground storage tanks for education and outreach.

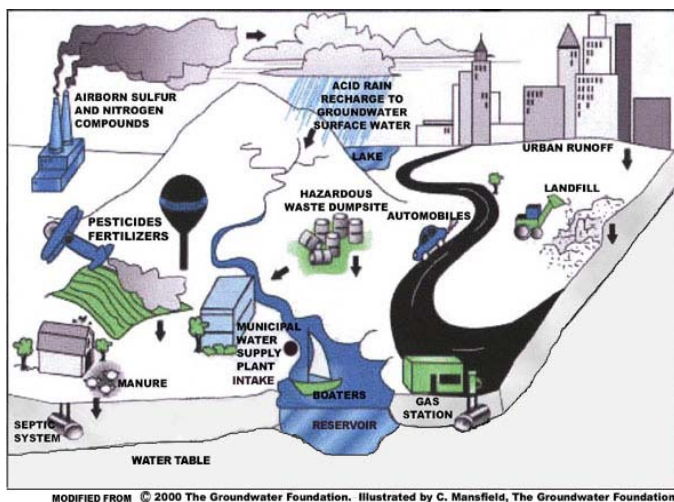


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ **Aboveground Storage Tanks** - Provide educational materials to residents regarding the proper storage of liquid petroleum products in aboveground storage tanks. The Department recommends zoning and non-zoning controls to prohibit the siting of liquid petroleum products storage in protection areas unless such storage is aboveground, on an impervious surface and either in a container or in an aboveground tank within a building, or in an area that has a containment system designed and operated to hold either 10 percent of the total possible storage capacity of all containers, or 110% of the largest container storage capacity whichever is greater. Consult with the local fire department for any additional local code requirements regarding aboveground storage tanks. A fact sheet on basement or outside oil tank can be obtained from the <http://www.state.ma.us/dep/bwsc/files/HSFS.pdf>



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	IWPA	Watershed	Potential Contaminant Sources*
<b>Agricultural</b>					
Forestry Operation	Numerous	L	—	Windsor Egypt	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Livestock Operations	1	M	—	Windsor	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	1	H	—	Windsor (Egypt)	Pesticides: leaks, spills, improper handling, or over-application , (Right of Way areas only)
<b>Commercial</b>					
Gas Stations	2	H	—	Windsor	Automotive fluids and fuels: spills, leaks, or improper handling or storage
<b>Residential</b>					
Fuel Oil Storage (at residences)	Numerous	M	Yes	Windsor	Fuel oil: spills, leaks, or improper handling. May be AST or UST
Lawn Care / Gardening	Numerous	M	Yes	Windsor	Pesticides: over-application or improper storage and disposal
Septic Systems / Cess-pools	Numerous	M	Yes	Windsor	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>					
Aquatic Wildlife	Periodic	L	—	Windsor	Microbial contaminants
Clandestine Dumping	Periodic	H	—	Windsor	Debris containing hazardous materials or wastes
Composting Facilities	1	L	—	—	Organic material, animal waste, and runoff: storage and improper handling
Transmission Line Rights-of-Way - Type: Electric	1	L	—	Egypt	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Yes	Windsor	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Land Uses	Quantity	Threat	IWPA	Watershed	Potential Contaminant Sources*
Underground Storage Tanks	1	H		Windsor	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L		Windsor	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator		L		Windsor	Hazardous materials and waste: spills, leaks, or improper handling or storage

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and trans-

**3. Transportation Corridors** - Route 9 runs through the IWPA and the watershed of Windsor Reservoir, and local roads are common throughout the protection areas. Route 9 is a heavily traveled State road, and therefore poses a greater threat to those supplies that are in close proximity to it; however, it is equally important to use best management practices in any area with transportation corridors within the protection areas. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

**Transportation Corridor Recommendations:**

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the watershed can be effectively contained and that those teams are aware of the boundaries of your watersheds and IWPA.

**Stormwater Catch Basins Recommendations:**

- ✓ **Inspect, Maintain, and Clean** - Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in runoff. Note: Catch basin cleanings are classified as solid waste by DEP and must be handled and disposed in accordance with all regulations, policies, and guidance. In the absence of written approval from DEP, catch basin cleanings must be taken to a facility permitted by DEP to accept solid waste. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ **Best Management Practices** - Work with the Towns to develop Best Management Practices that are the most effective, practical means of preventing or reducing pollution from nonpoint sources. Information is available at <http://www.epa.gov/OWOW/NPS/roads.html>.
- ✓ **Local Controls** - Encourage and assist officials to develop a local stormwater ordinance. For more information see <http://www.epa.gov/owow/nps/ordinance/stormwater.htm>.
- ✓ **Storm Drain Stenciling Program** - Work with local watershed groups to institute a Storm Drain Stenciling

Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>

- ✓ **Stormwater Planning** - Encourage local officials to become familiar with and begin to implement a stormwater management program to meet DEP's Phase II Storm Water Regulations. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/www/wwpubs.htm#storm>.

**4. Hazardous Materials Storage and Use** – A very small percentage (<1%) of the land area within Windsor Reservoir's watershed is commercial land use. Many small businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**5. Protection Planning** – Forested land covers 59% of the IWPA, 87% of the Windsor Reservoir watershed, and more than 95% of the Egypt Brook Reservoir

watershed. Protected open space within the IWPA and watershed is noted on the Land Uses section of the map, the greatest of which is within the Egypt Reservoir's watershed. Currently, Dalton has not passed any bylaws to comply with water supply protection control regulations 310 CMR 22.21(2), which should include floor drain prohibitions.

Dalton has sold Conservation Restrictions (CR) to the MA DEM to allow public access to the watershed. Although the CR limits allowable activities, it does not specify control measures other than a 500 foot setback from the reservoir.

Wellhead Protection Plan and a Watershed Protection Plan coordinate community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public education and outreach, and can help to pass a bylaw for control regulations. The development of successful Plans are outlined in five steps in DEP's "Developing a Local Wellhead Protection Plan" and in "Developing a Local Watershed Protection Plan" (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Water Source Protection Areas
- Identify potential sources of contamination
- Protect and manage the source protection areas
- Conduct ongoing public education and outreach
- An access control and monitoring plan should be an integral part of a watershed protection plan. The assessment of potential impacts of public access to the watershed are critical in protecting the water supply and for long and short term planning for the Water District.
- Since both Pittsfield and Dalton utilize the Windsor and Cady Brook watersheds, consider consulting with Pittsfield to develop a watershed protection strategy.

Please use the guidance booklets included in the appendix to help create your plan. Compile the information supplied in the Zone II reports, this and other reports; include copies of maps outlining the protection areas (Zone I, IWPA, Zone

**Top 5 Reasons to  
Develop a Local Wellhead  
and Surface Water  
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

A, Zone B, and Zone C) and detail the protection measures in place. Outline a plan with a time line for completion of the various plan components. Submit your written report to the DEP Regional office and/or Boston office for approval.

#### **Protection Planning Recommendations:**

- ✓ Create and formalize a Wellhead Protection Plan and a Watershed Protection Plan. Refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan" (see Appendix A).
- ✓ Work with the other host communities (Peru, Windsor, Hinsdale) to adopt protective bylaws and regulations for the Windsor Reservoir watershed. The Department will be instrumental in assisting Dalton in this effort.

**6. Agricultural Activities** – Crop and pasture lands make up about 22% of the land use in the IWPA, 4% in the watershed of Windsor Reservoir. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits compost facilities and field application are potential sources of contamination to ground and surface water. The Egypt Brook reservoir watershed is not owned by the District although the property is protected from development by Agriculture Restrictions. The entire watershed is forested and actively logged. The owner demonstrates apparent good stewardship of the land, however the access points to the forestry activities are within the Zone A of the reservoir and feeder brook posing a serious potential threat to the source from accidental petroleum release.

#### **Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Current land owners are predominantly excellent land stewards employing BMPs.
- ✓ Work with the landowner to identify alternative access for forestry operations. If that is not feasible, encourage the requirement that contractors working on the property inspect their vehicles and have sufficient absorbent materials to contain an accidental release.
- ✓ Consider purchase of Conservation Restrictions on large tracts especially within the Zone A.

**7. Electric Utility Right-of-Way** – Western Massachusetts Electric Company maintains power line Right-of-Way areas which transect the watershed of both surface water supplies, and run directly over brooks or rivers that are upstream

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

Land uses within the Zone III were not assessed for this report.

#### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

#### **Source Protection Decreases Risk**

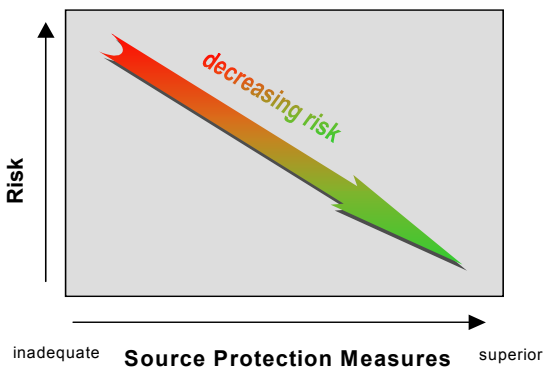


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

from the intakes. Normal maintenance of an electricity line right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on a right-of-way is a potential source of contamination. Leaks or spills of transported maintenance chemicals are also potential sources of contamination to the water supply.

#### **Electric Right of Way Recommendations:**

- ✓ Review the electric right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the watershed but especially within the Zone A, and that the utility has accurate information regarding the locations of the wells and the Zone I and Zone A. Meet with the utility and review the maps the utility uses and, if necessary, supply them with updated copies.
- ✓ Work with your local fire department to review

emergency response plans. Updates to this plan should include the electric rights-of-way including coordination with the owner/operator of the company or companies using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from accidents within the watershed, which should attempt to include representatives from the owner/operator of the utility company utilizing the right-of-way.

**8. Presence of Aquatic mammals in Surface Water Watershed** – There is past history of aquatic mammals (beavers and muskrats) living in and near the surface water supplies, specifically Windsor Reservoir. Aquatic mammals pose a potential threat of microbial contamination of the source from *Giardia Lamblia* and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water.

**Presence of Beavers in Surface Water Sources Recommendations:**

- ✓ Monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake.
- ✓ Monitor raw water quality and assess potential impacts.

Other land uses and activities within the watersheds and IWPA that have

potential for contamination are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system source water areas contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Keeping good relations with land owners in the IWAP and the watersheds especially the Zone As for better protection of the water supply.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Develop a Watershed Protection Plan with emphasis on public access control and management. Include assessment of funding mechanisms to manage watershed inspections and management as required. Evaluate and assess current activities and their potential or existing impacts to water quality and source vulnerability.
- ✓ Inspect the Zone I/Zone A regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams in watershed host communities to ensure that they are aware of the stormwater drainage in your IWPA and watersheds when responding to spills or accidents. Include MA Highway Department and the communities of Windsor, Hinsdale, and Peru.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Continue working with farmers and land owners in your protection areas to make them aware of your water supply and to support the use of a NRCS farm plan to protect water supplies and BMPs for all activities.

**Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix



DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

**Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the water supply protection areas. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Map of the Protection Areas

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I/Zone A?	<b>YES Zone I</b> <b>NO Zone A</b>	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Investigate purchasing, or obtaining Right of First Refusal of the Zone A land.
Is the Zone I/Zone A posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone I/Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply related activities the only activities within the Zone I/Zone A?	<b>NO</b>	Continue monitoring non-water supply activities in Zone I and Zone As.
<b>Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)</b>		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20 C or Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>NO</b>	The Town does not meet DEP’s best efforts for surface water or wellhead protection. However, the District does monitor activities in the hay field to ensure that no fertilizers, manure or pesticides are used near the wellhead.
Do neighboring communities protect the areas of the watershed extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include surface water protection areas in their water supply protection controls. Continue to work with DEM on management of State Forest Lands within the watershed.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan or Local Surface Water Protection Plan?	<b>NO</b>	Develop a water supply protection plan or plans to incorporate the surface water supplies and the well. Follow “Developing a Local Wellhead Protection Plan” and other guidance available at: <a href="http://www.state.ma.us/dep/brp/dws">www.state.ma.us/dep/brp/dws</a> . Develop an access plan to control public access to the watershed. The cost of management must be incorporated into long term planning.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>NO</b>	Create plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a water supply protection committee?	<b>NO</b>	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance, see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> .
Does the PWS provide water supply protection education?	<b>NO</b>	Aim education at schools and commercial, industrial, and municipal uses within the watershed. Extend these education practices into the host communities of the surface water supplies.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Deerfield Fire District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Deerfield Fire District
<i>PWS Address</i>	167 Mill Village Road
<i>City/Town</i>	Deerfield
<i>PWS ID Number</i>	1074000
<i>Local Contact</i>	Mr. Brian Dejnack
<i>Phone Number</i>	413-773-3359

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells, springs and reservoirs may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

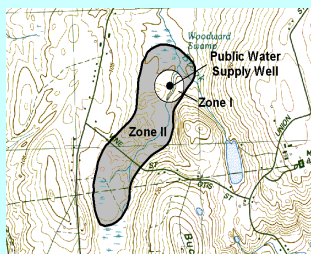
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**System Susceptibility:** High

### Spring Names

### Source IDs

**MA GIS Zone II #:** 588

**Susceptibility:** Moderate

Keats Spring	1074000-02G
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**MA GIS Zone II #:** 589

**Susceptibility:** High

Wells Spring	1074000-03G
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**MA GIS Zone II #:** 590

**Susceptibility:** High

Harris Spring	1074000-04G
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**MA GIS Zone II #:** 591

**Susceptibility:** High

Stillwater Spring	1074000-06G
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**IWPA Upper Reservoir = 1,520 ft. radius** **Susceptibility:** High

Upper Reservoir Spring	1074000-07G
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**MA GIS Zone II #:** 286

**Susceptibility:** High

Well Name	Source IDs
Stillwater Well	1074000-05G

**IWPA Wapping Well = 2,640 ft. radius** **Susceptibility:** High

Wapping Well	1074000-01G
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Deerfield is a small, rural, developing residential and agricultural community located in northwestern Massachusetts in the Connecticut River valley. Deerfield is home to at least three private schools, Historic Deerfield and craft fairs. Light industry has recently expanded into the community. Deerfield's topography is primarily fertile valley in the center of town with north-south trending hills on the east and west sides of town. The Pocumtuck Range trends north-south along the eastern side of town and the Berkshire foothills begin along the west side of town. The Deerfield River flows through the northern portions of town. The Deerfield River flows northwest to southeast through the foothills until it enters the river valley, where it flows north then east to its confluence with the Connecticut River. The Connecticut River flows south and forms the eastern boundary of Deerfield.

Deerfield is served by two water districts: Deerfield Fire District and South Deerfield Water Supply District. The Deerfield Fire District serves the northern parts of town and also serves as a supplement to Eaglebrook School's public

water supply. The Deerfield Fire District maintains and operates seven public water supply sources. There are five spring systems: the Keats Spring (1074000-02G), Wells Spring (1074000-03G), Stillwater Spring (1074000-05G), Harris Spring (1074000-04G) and Upper Reservoir (1074000-07G). Deerfield Fire District also maintains two wells - Stillwater Well (1074000-05G) and Wapping Well (1074000-01G); the Wapping Well is an emergency source that has not been used as a steady source of water since approximately 1980 due to water quality.

Water from the Keats Spring (02G) cistern flows by gravity into the Wells Spring (03G) cistern where the water is disinfected with chlorine. Water then flows to a 50,000 gallon storage/collection cistern, the Upper Reservoir Spring. Water from all three sources continues to flow by gravity to the large 200,000 storage tank and to the distribution system. Excess water from the Wells, Keats, and Upper Reservoir spring systems may overflow the main storage tank. The Keats, Wells and Upper Reservoir spring collection systems are located upon a bedrock high of the Sugarloaf Formation sandstone on the Pocumtuck Range.

The Stillwater and Harris Spring collection systems and the Stillwater Well are installed in glacially deposited sand and gravel at the base of a bedrock (schist) escarpment. The Stillwater and Harris springs are actually comprised of a large number of individual spring boxes that are connected by manifold and eventually flow by gravity together into a pump station (Harris/Stillwater Spring Pump Station). The spring systems were constructed by the Civilian Construction Corps in the 1920s and 1930s. The District does not have accurate construction details, exact number or location of all the spring boxes. In general, each spring box is roughly two feet in diameter and two feet deep with dry stone masonry walls and a gravel bottom. In recent years the District has made an effort to locate the individual spring boxes and work is done to clear away surrounding brush, pour a concrete cap around a locking metal cover and grade the ground around the box to improve the sanitary seal on the box and prevent surface runoff from entering the box.

At least thirteen individual spring boxes comprise the Stillwater Spring (06G). As many as eight boxes collect flow from the western base of the hill and five boxes collect from the eastern base of the hill. In general, water from the spring boxes located higher on the hill, flows downhill into the lower boxes through buried clay pipe. At the base of the western side of the hill is a large concrete collection tank. Similarly, there is a tank at the base of the eastern set of boxes. Water from both the eastern and the western collection tanks flow to a third tank that collects all of the water from the Stillwater Spring. The collection tanks do not allow natural groundwater infiltration. Water then flows into the Harris/Stillwater Spring Pump Station.

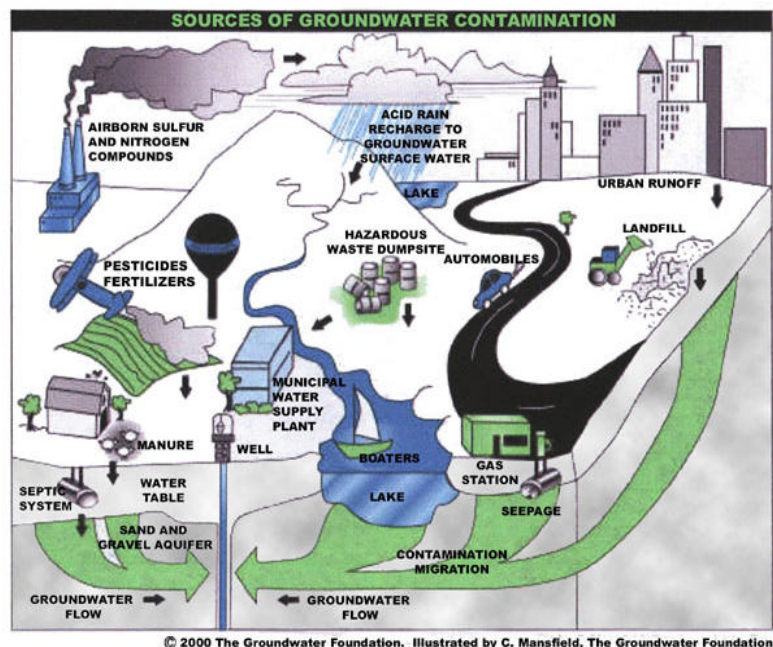
The Harris Spring system (04G) is located along the base of the same hill as the Stillwater Spring, but is several hundred feet

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.





south of the Stillwater spring system. The Harris spring system is comprised of five spring boxes and a single concrete collection tank. Water then flows from the collection tank to the Harris/Stillwater Pump Station.

The Harris/Stillwater Pump Station (built in 1990) has a 25,000 gallon wet well that collects all the flow from both the Harris and Stillwater spring systems. Provided there is water in the wet well, a single, vertical turbine pump, continuously pumps water (40 gpm) into the distribution system. Occasionally, flow from the spring exceeds the capacity of the pump and the excess water overflows to the Stillwater Brook. Water from the Stillwater Spring passes through a marble chip basket which buffers the pH of the water for minor corrosion control. All water from the Stillwater and Harris Springs is disinfected at the Harris/Stillwater Pump Station prior to distribution.

The Stillwater Well (05G) is located along the southern bank of the Deerfield River near the Stillwater and Harris Spring systems. The well is a 16 x 24-inch diameter gravel packed well, approximately 55 feet deep. The surficial materials within the valley are sand, silt and in some areas are glacio-lacustrine clay deposits laid down during the recession (melting) of the glaciers some 12,000 years ago. In the river valleys, recent alluvial deposits overlay the glacial deposits. The bedrock beneath the valley area and the eastern highlands is mapped as sandstone of the Sugarloaf formation, with the western hills mapped as the Conway Formation, predominantly schist with beds of quartzite.

Through the SWAP program, the Department retained the USGS to delineate the recharge contribution area or Zone II recharge area, for each of the spring sources. The discharge from the springs was estimated based on flow measurements and the area of contribution was delineated based on geologic mapping of bedrock/overburden materials and topography. The Zone II for the Stillwater Well was previously delineated by a consultant utilizing data from an extended duration pumping test, geologic mapping and analytical modeling of the aquifer. Water from the well is treated with soda ash for corrosion control and disinfected with chlorine prior to distribution into the system.

The Stillwater and Harris Spring systems and the Stillwater Well Zone II are located within the same unconfined, sand and gravel aquifer and share some of the same recharge area. Although the springs are located within the glacially deposited sand, they are located at the base of a bedrock escarpment and there is significant contribution from the bedrock as well as the overburden. The Zone II for the well and springs include areas south of the Deerfield River on the west side of town. The land use within the recharge area is residential, agriculture and sand and gravel mining.

The Zone II for the Keats Spring (02G) is primarily forest and has numerous school recreational trails throughout the area. The Zone II for the Wells Spring (03G) is primarily forest with recreational trails, but also includes two school dormitories, associated parking and activities, stormwater runoff, and two fuel oil USTs. According to the school, they have

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



### Source Protection Decreases Risk

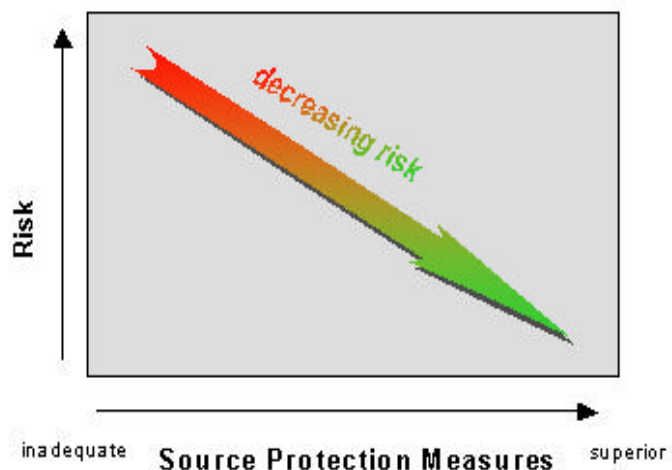


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Land Uses	Quantity	Threat	Source ID Zone II/ IWPA	Potential Contaminant Sources*
<b>Agricultural</b>				
Fertilizer/ pesticide storage or use	Numerous	M/H	01G, 04G, 05G, 06G	Fertilizers: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Maintenance shop	1	H	07G	Petroleum products, solvents, paints: spills, leaks, or improper handling
Residential school	1	M	03G, 07G	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage, storm-water management
Very Small Quantity Haz- ardous Waste/ Oil Generator	2	M	01G, 07G	Hazardous materials and waste: spills, leaks, or improper handling or storage
Transportation corridors/ Util- ity Right-of-way	Numerous	M/H	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground storage tanks	Numerous	H	03G, 07G	Stored materials: spills, leaks, improper delivery or handling
Sand & gravel mining	1	M	04G, 05G, 06G	Spills or leaks from fuel storage, petroleum leaks from equip- ment, clandestine dumping, erosion
Aboveground storage tanks	Numerous	L/M	04G, 05G, 06G	Stored materials: spills, leaks, improper delivery or handling
<b>Residential/ Miscellaneous</b>				
Fuel oil storage (at residences)	Numerous	M	01G, 04G, 05G, 06G	Fuel oil household hazardous materials: spills, leaks, or im- proper handling
Lawn care / Gardening	Numerous	M	01G, 04G, 05G, 06G	Pesticides: over-application or improper storage and disposal
Septic systems / cesspools	Numerous	M	01G, 04G, 05G, 06G	Hazardous chemicals: microbial contaminants, and improper disposal
Aquatic animals	Periodic	H	02G, 03G, 04G, 06G	
Farm dump	1	M/H	05G	Petroleum wastes, hazardous materials, microbial contami- nants, inorganic wastes

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

directed most of the stormwater runoff to surface water bodies and to the pond. It has been previously noted that the stormwater BMP controls runoff from Pine Nook Road and the dormitories access roads.

The Zone II for the Upper Reservoir Spring (07G) has not yet been delineated but the land area upgradient of the source includes the Wells Spring Zone II. However, until the Zone II for that spring source has been delineated, an Interim Wellhead Protection Area was calculated based on the estimated yield of the spring source of 35 gpm. The

IWPA is a radial area of 1,520 feet and includes all of the Eaglebrook School and much of the Wells Spring Zone II area. Please refer to the attached map to view the boundaries of the Zone II for the well, the Draft Zone II and the IWPA for the springs.

The Upper Reservoir Cistern is located approximately 43 feet upgradient (east) from the edge of a drainage brook. The Eaglebrook School maintenance garage is immediately across the brook with the parking lot for the maintenance garage located 10 feet from the edge of the brook. There is no curb or stormwater control measures in the parking lot. All school maintenance equipment is stored at the garage and the facility is a registered Very Small Quantity Generator of waste oil and hazardous waste and has a gasoline UST for school vehicles. Other materials, dumpsters and the trash pickup truck are also stored in the parking area. These activities may pose a potential threat if runoff from the parking area is allowed to discharge to the brook. Eaglebrook School installed a stormwater collection and drainage system along Pine Nook Road to collect runoff from Pine Nook Road and the access roads to the dormitories south of the road. This BMP helps to protect the springs in the event accidental release along Pine Nook Road or at the dormitories.

In general, the source water area for springs is assumed to be the land area that is topographically uphill (upgradient) of the spring. However, the Department also includes a rectangular area terminating 50 feet downgradient of the spring source within the regulated protection area as a buffer to protect the source. The topography rises north, east and south of the Upper Reservoir Cistern and the Wells Spring is located approximately 300 feet northeast (upgradient) of the Cistern. It is likely that the actual recharge area of the Upper Reservoir Cistern mimics the Zone II of the Wells Spring, although it would obviously start at the spring. It is likely that the maintenance garage and parking areas are not within the recharge area for the Cistern, however, until the recharge area has been determined for that source, caution should be used for all activities in the vicinity of the spring and BMPs should be used for all activities at the garage. Due to the proximity of the drainage swale/brook between the spring and the maintenance garage, precautions should be used to prevent discharges or accidental releases of potentially hazardous material to the drainage area.

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ① Reduces Risk to Human Health
- ② Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ③ Supports municipal bylaws, making them less likely to be challenged
- ④ Ensures clean drinking water supplies for future generations
- ⑤ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

The springs and well are located in areas highly vulnerable to contamination from surface sources because there is minimal overburden in the Zone II of the Keats, Wells and Upper Reservoir and there is no protective clay layer. Only sand is logged in the Zone II area for the Stillwater and Harris Springs and the Stillwater Well with no evidence of a protective clay or confining layer. Sources located in this type of environment are considered highly vulnerable to contamination from activities on the land surface. In fact, low levels of 1,2-Dichloropropane, a compound that had been used in agricultural activities was reported during the initial water quality testing of the Stillwater Well, however, it has not been detected since 1981. Spring sources are generally considered to be highly vulnerable to surface contamination and activities or disturbance on the land surface.

The Wapping Well (01G) is a 33 feet deep, 12 x 24-inch diameter, gravel packed well, installed in 1949 and located along Route 5. The well has not been continuously used since about 1980 due to water quality issues associated with elevated levels of iron, manganese and sodium. The well is located approximately 65 feet from Route 5, between Route 5 and an abandoned railroad track; the District owns approximately 1 acre of land around the well. The well utilizes the shallow sand and gravel water table aquifer with an original estimated yield of 163 gpm. The well logs indicate the shallow water table aquifer overlies a clay unit of undetermined thickness. At some point in the past, the production of the well reportedly decreased due to fouling of the screen and the well was redeveloped. The District personnel periodically exercise the pump and collect water quality samples for analysis in the event they should ever need to utilize the well in a water emergency.

The source protection area is an Interim Wellhead Protection Area (IWPA) rather than a Zone II, because the actual recharge area for the well has not been determined. The Zone I and IWPA radii for the Wapping Well are a 400 foot radius and 2,640 foot radius, respectively. There is a surface water divide south of the Wapping Well and based on surface water flow, it is assumed that the shallow groundwater near the Wapping Well likely flows west and north discharging to the Deerfield River. The IWPA includes agricultural, residential and commercial land uses as well as transportation corridors including Route 5 (65 feet from the well) and the Boston & Maine Railroad to the east. A large greenhouse is located just southwest of the well.

The pH of the water from the sources is adjusted for corrosion control and the water is disinfected with chlorine prior to distribution. The District is presently working with the DEP to improve the efficiency of the corrosion control treatment process. For current information on monitoring results, please request a copy of the most recent Consumer Confidence Report from the Public Water System contact person listed above in Table 1.

## Section 2: Land Uses in the Protection Areas

The land use within the Zone IIs and IWPA for Deerfield Fire District's sources include mixed use of forest, residential, institutional and agricultural activities, (please refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Agricultural activities

### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

### Additional Information

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

3. Residential land uses
4. Transportation corridors/utility right-of-way
5. Hazardous materials storage and use
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2. As previously noted, the aquifer that the Stillwater Well utilizes is considered highly vulnerable to contamination from activities on the ground surface due to the lack of a protective confining clay layer. Some springs are inherently highly vulnerable to contamination from surface water and activities in the ground surface.

**1. Non-conforming Zone I** – The Zone I for the Stillwater Well 05G is a 400-foot radius around the wellhead; the Zone I for the springs are square boxes oriented upgradient from the source. The Zone I area is oriented so that the spring's outlet is centered from side to side and downgradient edge of the Zone I square is 50 feet from the outlet. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only activities directly related to water supply or non-threatening activities are allowed in the Zone I. Many public water supplies were developed prior to the Department's regulation and contain non-water supply activities such as homes and public roads and may not be fully owned by the District. The Department encourages water suppliers to acquire ownership or control of the Zone I area. The District does not own or control the entire Zone I for the Wapping Well as route 5 is within 75 feet of the well. The DEP guidelines for the New Source Approval (NSA) specify that any well not used for more than five years is subject to the NSA. That process evaluates the potential threats to a water supply before it is approved for use.

The Zone I of the springs has been modified based on estimates of flow from the springs. Based on the newly delineated Zone Is, all are non-conforming as the District does not own or control the entire Zone I. The District is presently negotiating the acquisition of additional land in the recharge area of the Harris Spring. The following activities are within the Zone I of the sources:

- Forest with recreational trails throughout
- Pine Nook Road (a very low use, dirt road)
- Stillwater Road
- Hay fields
- Corn fields
- Electrical utility right-of-way
- Private homes
- Maintenance garage parking area

#### **Zone I Recommendations:**

- ✓ Communicate with Eaglebrook regarding their continued efforts to control runoff and stormwater at the school and to evaluate stormwater management at the maintenance garage. Encourage the continuation of cleaning up all debris that may have fallen over the bank and into the drainage swale/brook between the spring and the garage. Request that the school consider placing a berm on the edge of the parking area and direct runoff to storm drains south and west of the maintenance garage rather than into the swale/brook.
- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
- ✓ Prohibit new activities from the Zone Is.
- ✓ Communicate with property owners in Zone Is and in Zone IIs proximal to the sources. If they are not aware that they are within the protection areas discuss land uses with them and provide them with BMPs or information regarding protection of the water source as necessary.
- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.

A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the



septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.

The Department strongly recommends that the Deerfield Fire District continue its present efforts to acquire property within the Zone I and Zone II of the spring sources if you intend to continue use of those sources. If there is no other reasonable method to secure rights and protect these sources, the District should seriously consider taking necessary water supply land by eminent domain to protect the sources.

**2. Residential Land Uses** – A small percentage of the Zone II for the Stillwater sources, Harris spring and the IWPA of the Wapping Well include residential development. Municipal wastewater sewers are not available in the protection areas, therefore, all protection areas utilize septic systems for wastewater disposal. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination from residential land use include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems discharge to the ground. If septic systems fail or are not properly maintained, they are a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation corridors and right-of-way** - Several local roads are located within the Zone II of the Stillwater and Harris Springs and the Stillwater well. There is also an electric line right-of-way. There are local access roads to the Eaglebrook School and dormitories of the Wells Spring Zone II and the Upper Reservoir IWPA. Roadway construction, right-of-way vegetation maintenance, and typical use can all be potential sources of contamination for springs and wells. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins. As an example, accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Remote roadways are also frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

In addition, the Wapping Well IWPA has a section of railroad line within the IWAP in the direction that is likely upgradient of the well. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

**Transportation/Right-of-way Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Examine the road grade and drainage along roads in the protection areas and evaluate the potential impact on the sources. Consider use of BMPs if the use of these roads increases over time.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Notify Town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural Development Manager at the local office in Hadley at 413-585-1000 ex. 4. Review the fact sheet available online and available information about funding at the website <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.
- ✓ Review the utility right-of-way Yearly Operating Plan (YOP) to ensure best management practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the protection zones. Review the maps the utilities use. The Board of Selectmen or the Conservation Commission may receive the YOP.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control. Request that the railroad emergency response teams coordinate Emergency Response Drills and practice containment of potential contaminants from accidents within the Zone II. And include the District in their notification list.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the right-of-way and roadways. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from accidents within the Zone II.

**4. Institutional use with hazardous materials storage** – The land area within the Zone II for the Wells Spring and the IWPA for the Upper Reservoir cistern includes Eaglebrook School. The school is served by the municipal sewer system and is predominantly topographically downgradient from the spring sources. Two dormitories with underground storage tanks (UST) and internal access roads are located within the delineated Zone II for Wells spring. The entire campus is within the IWPA for the Upper Reservoir cistern spring. The maintenance garage is located approximately 150 feet from the cistern and has a 1,000 gallon gasoline UST and hazardous materials storage; the facility is topographically downgradient and on the opposite side of a drainage divide from the spring. The two dormitories, one older and one new, that are within the Zone II have an 8,000 gallon and 2,500 gallon fuel oil storage USTs, respectively. There are a total of eleven USTs at Eaglebrook School. Most of the tanks were installed between 1984 and 1987; one tank was recently installed at the new dormitory in 2000.

If hazardous materials are improperly stored, used, or disposed, they become significant potential sources of contamination. Hazardous materials should be managed with extreme care in areas served by on-site water supply wells. USTs should be managed with care as well. Delivery should be monitored carefully because many spills occur during delivery.

The school has recently installed stormwater drains and collection system to remove stormwater runoff from the roadway upgradient of the Wells Spring and the Upper Reservoir cistern. According to the District and school facility manager, stormwater is directed toward the pond downgradient of the Wells spring and Upper Reservoir sources.

**Institutional use with hazardous materials storage :**

- ✓ Encourage the facility manager to incorporate an Integrated Pest Management (IPM) approach into the school's pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment. Encourage the facility manager to ensure that any pesticides and fertilizers that are being stored are within a structure designed to prevent runoff and if possible downgradient of Deerfield's and Eaglebrook's water supply sources.
- ✓ Continue discussions with Eaglebrook's Director of the Physical Plant to ensure they continue to handle and dispose hazardous materials properly and that USTs are monitored. Encourage the continued use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Discuss with the school's facility management whether they have overfill containment on the school oil tanks. Suggest installation of overfill protection on tanks that are not equipped with protection.

**6. Agricultural activities** – There are croplands and pasture lands within the Zone II of the Stillwater and Harris sources of water and the IWPA of the Wapping Well. These lands include hay, corn and other crop fields. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. Very often, farms also maintain old disposal areas (farm dumps), heavy equipment and store petroleum products and generate hazardous waste. As with other types of businesses that use, store or generate hazardous materials, proper use, storage and disposal is critical for protecting the environment and minimizing liability. Additionally, historically, farmers often have gravel borrow pits on-site. Disturbance of the overburden upgradient of springs is a significant potential threat to water quality in the springs. Any gravel mining activities

**Agricultural activities Recommendation:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online and call the local office in Hadley at 413-585-1000 ex. 4. of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous materials handling, storage, disposal, and emergency response planning.
- ✓ Encourage farmers, including nurseries and commercial property managers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs such as those listed on the USDA web site: <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Work with any non-commercial farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.
- ✓ Note any forest management activities, especially within the Zone II of the springs. Disturbance of the thin overburden material may impact water quality in the springs.

**7. Protection Planning** - Although Deerfield has water supply protection controls, they do not fully comply with the DEP Wellhead Protection regulation 310 CMR 22.21(2) and do not cover all of the protection areas in Deerfield. A technical assistance (consulting) firm is currently in the process of completing a Wellhead Protection Plan for the Deerfield Fire District. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

**Protection Planning Recommendations:**

- ✓ Coordinate efforts with local officials to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Request that the Boards of Health adopt floor drain controls that meet 310 CMR 22.21 (2) and conduct inspections.

Another land use that was identified in the Zone II is a gravel mining operation near the Stillwater and Harris spring sources. Mining poses numerous threats from accidental release of petroleum products and erosion to illegal dumping in abandoned mines. Spring sources are particularly susceptible to activities that disturb the surface such as mining and forestry. The District should continue to monitor the activities in the Harris Spring Zone II and the Department encourages the efforts to acquire control of that property if you intend to continue use of that source. Additionally, there are commercial land uses within the IWPA of the Wapping Well that may utilize hazardous materials.

Activities within the protection areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about land uses that are permitted facilities and USTs. Identifying potential sources

of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The Deerfield Fire District is commended for:

- current efforts in upgrading the system's infrastructure, and
- for having protective bylaws.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Acquire ownership or control of the Zone I and Zone II areas critical to protecting the District's sources.
- ✓ Inspect the Zone Is regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents and abutters on ways they can help you to protect drinking water sources through the use of BMPs.
- ✓ Work with emergency response teams to ensure that they are aware of your Zone IIs and will cooperate in responding to spills or accidents.
- ✓ Continue communications with Eaglebrook School to ensure proper storage, handling, delivery and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement the Wellhead Protection Plan upon completion and MA DEP approval.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### **➤ Partner with Local Businesses:**

Since many facilities and businesses use hazardous materials and produce hazardous waste products, it is essential to educate these businesses about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### **➤ Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it is a potential source of microbial and nitrogen contamination. Animal waste is also a source of contamination.

#### **➤ Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

#### **➤ Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use and regulations related to watersheds and groundwater protection. These controls may include health regulations, discharge prohibitions, general ordinances, and zoning bylaws/ordinances that prohibit or control potential sources of contamination within the protection areas.

#### **➤ Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State

Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site at <http://search.sc.egov.usda.gov/nrcs.asp?qu=equip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

The Massachusetts Department of Food and Agriculture's Agricultural Environmental Enhancement Program (AEEP) provides funding to farmers to install a variety of water quality protection practices. For more information on the program contact the coordinator, Susan Phinney, at (617) 626-1772, [Susan.Phinney@state.ma.us](mailto:Susan.Phinney@state.ma.us).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. District officials, citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection



**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue efforts to purchase or control activities in the Zone I as feasible.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is and attempts to acquire Zone I.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>Partial</b>	Deerfield does have an aquifer protection bylaws. However, they should be reviewed for compliance with 310 CMR 22.21(2) and the overlay district must be modified to include, at a minimum, the Zone II and IWPA protection areas. Please refer local boards to these recommendations and to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>In Progress by NeRWA</b>	Once the plan has been approved by the MA DEP, implement the plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>Partial</b>	Augment the plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish a committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at institutional, commercial, agricultural and residential land uses within the Zone IIs and IWPA.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**South Deerfield Water Supply District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	South Deerfield Water Supply District
<i>PWS Address</i>	P.O. Box 51
<i>City/Town</i>	Deerfield
<i>PWS ID Number</i>	1074001
<i>Local Contact</i>	Mr. Roger Sadoski
<i>Phone Number</i>	413-665-3540

### Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

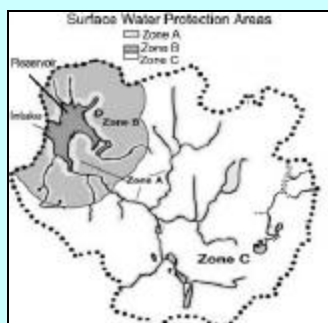
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

### *System Susceptibility:*

*Moderate*

### *Source Name*

### *Source ID*

### *Susceptibility*

Whately Glen Reservoir	1074001-01S	Moderate
Conway Reservoir	1074001-02S	Moderate

Deerfield is a small rural, agricultural and developing residential community located in northwestern Massachusetts along the Connecticut River valley. Deerfield is home to at least three private schools, Historic Deerfield and craft fairs. Light industry has recently expanded into the community. Deerfield's topography is primarily fertile valley in the center of town with north-south trending hills on the east and west sides of town. The Pocumtuck Range trends north-south along the eastern side of town and the Berkshire foothills begin along the west side of town. The Deerfield River flows through the northern portions of town. The Deerfield River flows northwest to southeast through the foothills until it enters the river valley, where it flows north then east to its confluence with the Connecticut River. The Connecticut River flows south and forms the eastern boundary of Deerfield.

Deerfield is served by two water districts: Deerfield Fire District and South Deerfield Water Supply District. The South Deerfield Water Supply District serves the southern section of town. The District maintains two reservoirs, Whately Glen Reservoir 01S and Conway Reservoir 02S, and the Sugarloaf Wellfield, a tubular wellfield 01G that is designated as an emergency source. The groundwater utilized in the Sugarloaf Wellfield was contaminated with EDB used on adjacent tobacco fields and the source has been off-line since 1984. The emergency source will not be discussed further in this report.

The Conway Reservoir, the main storage reservoir, is located in Conway. Water flows from the Conway Reservoir into the distribution reservoir, the Whately Glen Reservoir, a small distribution reservoir located in Whately, immediately downgradient of the Conway Reservoir. The watershed for the consecutive reservoirs is located in the foothills of the Berkshires on the eastern side of the Berkshire Massif. The topography of the watershed consists primarily of steeply sloping brook valleys and rolling hills. The overburden material within the watershed is predominantly a thin cover of glacial till, often referred to as hard pan, with significant areas of exposed bedrock. Some of the brook valleys have limited deposits of glacial, stratified drift (sand and gravel) or recent alluvium which are locally mined. The bedrock in the watershed is mapped as several formations consisting of metamorphic rocks and igneous intrusive rocks of the Conway Formation, predominantly schist and marble and the Williamsburg Granodiorite. The structural geology of the region is highly complex with several stages of folding resulting in a corrugated effect in the Conway Formation with faults along the valley wall.

The South Deerfield Water Supply District (District) owns approximately 910 acres (26%) of the watershed; an additional 21% of the remaining watershed is held in Chapter 61 tax status as agriculture/forest land or is state forest. Land use within the Conway/Whately Glen Reservoir watershed is primarily forested

upland (90%) with the remaining watershed consisting of residential and agricultural activities (both commercial and non-commercial) such as hayfields, pasture and forestry; a small percentage of land is utilized as commercial and transportation related land use. Please refer to the attached map to view the boundaries of the protective areas.

Water from the reservoirs is treated through a rapid sand filtration system, then chlorinated for disinfection and pH adjusted with soda ash for corrosion control. For current information on water quality monitoring results and treatment processes, please refer questions for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies the sources are considered highly vulnerable to potential contamination threats through land use. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Residential land use
3. Transportation corridors
4. Agriculture/Forestry
5. Protection planning

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at several moderate threat land uses within the water supply protection areas, as seen in Table 2. The active agriculture identified in the source protection map is primarily hay and pasture lands and portions of a dairy farm. Although manure spreading on fields had been conducted periodically in the past, reportedly it is not a current practice. Changing use on agricultural land should be monitored frequently by the water to ensure current knowledge.

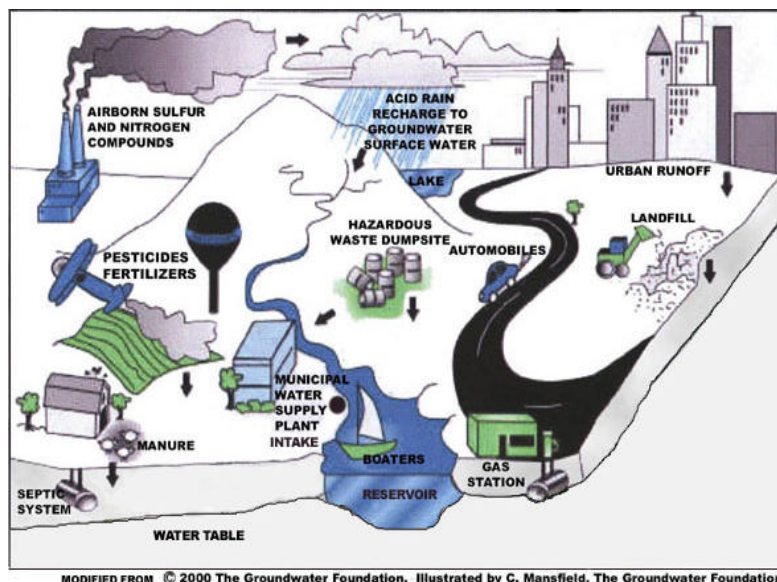
## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

**1. Activities in Zone A** - The Zone A for a reservoir includes all areas within 400 feet of the reservoir shoreline and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Zone A is the area closest to the reservoir and its tributaries. Therefore land uses within the Zone A are of particular concern. Activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc.



Overall, the watershed is sparsely populated;

Figure 1: Sample watershed with examples of potential sources of contamination

approximately 90% of the watersheds are forested. As noted, the District owns 26% of the watersheds and an additional 21% of the total watershed land has limited protection from development through tax status under Ch. 61 (agriculture/forestry) or is state park land. The following activities occur in the Zone A of the system's reservoirs:

**Whately Glen Reservoir (01S)** - Activities include a local road and agriculture (hay fields), and a few residential homes (utilizing private septic systems).

**Conway Reservoir (02S)** - Activities include local roads, hay fields with limited, manure spreading, on portions of a dairy farm and a residence (with private septic systems). According to the water supplier, actual farming activity is very limited within the watershed. For that reason, the dairy farm/manure spreading has been ranked as a moderate as opposed to a high threat. However, if agricultural activity increases within the watershed, the potential impacts to the water supply would increase unless activities are managed appropriately.

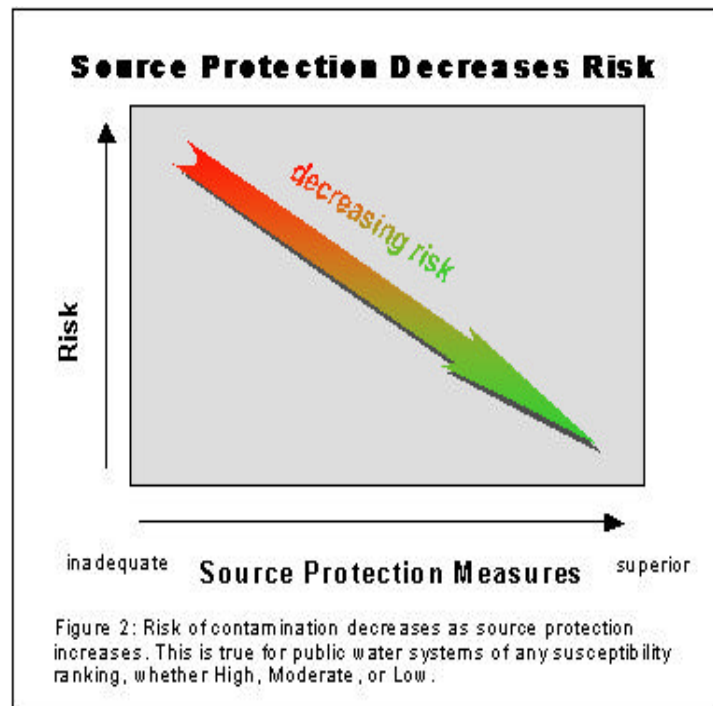
#### **Zone A Recommendations:**

- ✓ Monitor activities on agriculture land frequently to assess actual potential threats.
  - ✓ To the extent possible, remove all prohibited activities within your control from the Zone A to comply with DEP's Zone A requirements.
  - ✓ Storage of pesticides, fertilizers or road deicing materials within the Zone A should be covered and contained.
  - ✓ To the extent possible, inform landowners within the Zone A regarding the use of BMPs for residential uses and hobby farming.
  - ✓ Prohibit all new non-water supply activities from the Zone A on land within your control and provide comment to community boards regarding newly proposed development, as is appropriate.
  - ✓ Increase patrols and enforce the no trespassing requirement, as appropriate.
  - ✓ Prioritize land to be acquired, especially in the Zone A. Acquiring land and/or acquiring conservation easements is critical to source protection.
  - ✓ Investigate erosion and runoff within the watersheds and recommend BMPs as proposed in the project funded through the Source Protection Grant.
- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
- A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of pasture or hay fields within the Zone A would not have manure spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.



#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.





### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watersheds**

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
<b>Agricultural</b>				
Dairy Farm (mostly outside of the watershed—marginal operation)	1	M/H	02S	Manure (microbial contaminants, nutrients): improper handling, erosion. Manure spreading is primarily outside of watersheds.
Forestry Operations	Few	M	01S, 02S	Leaks and spills, improper handling of petroleum products in equipment. Erosion.
Hayfields	5	M	01S, 02S	Leaks and spills, improper handling of petroleum products in equipment.
Agriculture—Pesticide/Fertilizer Storage or Use	Few	M	01S, 02S	Pesticides/fertilizers: leaks, spills, improper handling, or over-application. Petroleum products management for equipment.
<b>Residential</b>				
Fuel oil storage (at residences)	Numerous	M	01S, 02S	Fuel oil household hazardous materials: spills, leaks, or improper handling
Lawn care / Gardening	Numerous	M	01S, 02S	Pesticides: over-application or improper storage and disposal
Septic systems / cesspools	Numerous	M	01S, 02S	Hazardous chemicals, microbial contaminants, and improper disposal
Transportation corridors	Numerous	M	01S, 02S	Petroleum products and transported hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. Erosion.

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



- A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.
- ✓ The Department strongly recommends that the South Deerfield Water Supply District establish a program for planning to acquire ownership or control of property within the areas critical to protecting water quality of the reservoir. If there is no other reasonable method to secure rights and protect critical land areas, the District may wish to consider taking necessary water supply land by eminent domain to protect the sources. This recommendation is not only for the existing sources but also should be considered for future development of sources if they are needed.

**2. Residential Land Uses** – There are numerous residences located within the Whately Glen and Conway Reservoir watersheds. None of the areas have public sewers to remove wastewater, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Establish efforts of negotiating fee simple purchase, Right of First refusal agreement, conservation restrictions and Memorandum of Understanding for land not currently owned or controlled by the District.
- ✓ Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**3. Transportation Corridors** - There are numerous local roads throughout Conway/Whately Glen Reservoir watersheds, including many dirt roads/trails with legal (authorized) and illegal (unauthorized) use. Although most roadways in the watersheds are relatively low-use, even typical roadway maintenance and low use pose a potentially significant source of contamination from accidents and washouts and pesticide application for vegetation control along both the paved and dirt roads, especially in the Zone A. Unmanaged access may result in erosion, vandalism and/or illegal dumping which might cause water quality impairment. Erosion poses a potentially significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, by contributing sediment, various contaminants and pathogens which may result in additional water treatment costs if they continue unchecked. Clandestine dumping is identified as a potentially significant threat to water supplies because roadways can be sites for illegal dumping of hazardous or other harmful wastes. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater, washed and discharge into the feeder streams and reservoirs.

The District does not allow public access to District owned watershed land, however, there is evidence of illegal access on trails by ATVs. The District has an approved Surface Water Protection Plan that identified unauthorized access as an issue. The District was awarded a Source Water Protection Grant to identify stormwater related issues and to develop BMPs and a public education program. The District was also funded to have a forest management plan prepared for District owned land. Incorporation of BMPs in forestry operation is requisite to protect water quality.

**Transportation Corridor Recommendations:**

- ✓ Conduct regular inspection of watersheds for signs of access, illegal dumping and spills and enforce no trespassing.

- ✓ As part of your currently funded study, evaluate existing conditions throughout the watershed with respect to current legal and illegal use of watershed land. Identify illegal access and destinations and consider ways to address impacts from access. Some water suppliers have had success with posting land, public education, and rerouting trails off of District property and away from sensitive areas. For areas that are severely impacted, more aggressive measures of protection may include increased patrols by District personnel or locals police and impoundment of ATVs for trespassers. Develop a management strategy to eliminate and/or control access. Coordinate management strategies with the host communities.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Notify officials in the communities in which your watersheds are located of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural Development Manager at the local office in Hadley at 413-585-1000. Alternatively, review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Consider investigating disposition of any roads, ways and “trails” that may be old county roads or rights-of-way and pursue as appropriate, closing or controlling access.
- ✓ Continue with efforts to identify areas of concern with respect to runoff and erosion, develop and implement BMPs by working with the communities of Conway and Whately.

**4. Agricultural Activities/Forestry** – The watersheds include a small percentage, approximately 6%, of land for agricultural activities and an unknown percentage for forestry. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Frequently, farms have maintenance garages for equipment and storage tanks and forestry requires the use of heavy equipment. Presently,

according to the Water District, the commercial operations are small with few or no animals.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

#### **Agricultural Activities and Forestry Recommendations:**

- ✓ Monitor agricultural lands frequently to ensure current knowledge of activities and practices on farms and open fields. Communicate with land owners as is feasible.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of assistance provided by the Massachusetts Department of Food and Agriculture and the USDA Natural Resources Conservation Service (NRCS). The NRCS can provide assistance to develop a farm plan to protect water supplies, if they do not already have one. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local Hadley office of NRCS at 413-585-1000 for assistance.
- ✓ As part of a farm plan, farmers may incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling,

#### **Top 5 Reasons to Develop a Local Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

- ✓ storage, disposal, and emergency response planning.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance at 413-585-1000 for assistance. This may be also appropriate for the host communities of Conway and Whately.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.
- ✓ As part of the currently funded project, evaluate past forest management practice and prepare a water supply forest management plan and implement and update the plan as appropriate.

**5. Protection Planning** – The District has an approved Water Supply Protection Plan, however, plans periodically require updating to correct errors in the original plan, to reflect completed tasks and new conditions. The Department notes that the current plan has an error regarding the acres of land within the watershed protection areas, the percentage of land owned by the District and reports that road salt is not used on any roads within the watershed. An effective overall protection plan will not only include detailed land use, but also includes: coordinated community efforts which identify protection strategies, establishing a timeframe for implementation, and will provide a forum for public education and outreach. The watershed is primarily woodland with the District owning approximately 26%. Good forest management of both District land and private land can beneficially impact water quality and health of the watershed forests.

**Protection Planning Recommendations:**

- ✓ Establish active watershed protection planning and forest management for water supply protection in a comprehensive watershed plan.
- ✓ Encourage and support efforts by private land owners in active forest management for water supply protection.
- ✓ Consider working with communities and their local officials and boards in the watershed in active watershed protection planning and education efforts.
- ✓ Following the completion of the stormwater study and forest management plan, update the water supply protection plan. The 2000 WSPP did not include the inventory conducted by the District in 1999 of the fuel sources utilized in the watershed. Update that inventory in the next revision of the WSPP.
- ✓ Work with communities within which the watersheds are located to monitor and comment on any proposed development and growth, especially in the Zone A.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step toward protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### For More Information

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system's watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Pursuing funding for preparation and implementation of a Water Supply Protection Plan (WSPP), erosion control study and forest management plan,
- Active involvement in inspecting and inventorying land uses in the watershed,
- Detailed knowledge of the watershed.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue inspection of the Zone A protection areas regularly, and when feasible, remove or manage any non-water supply activities, specifically the maintenance activities and fuel oil storage in Zone A.
- ✓ Continue cooperation and communication with emergency response teams to ensure that they are aware of the boundaries of the watershed for notification of spills or accidents.
- ✓ Through the implementation of the WSPP, provide information to landowners in your protection areas to make them aware of your water supply and to encourage the use of best management practices for residential and recreational uses and other ways they can help you to protect drinking water sources.
- ✓ Update the Watershed Protection Plan following completion of the stormwater inventory and forest management plan.
- ✓ As part of the stormwater evaluation and mitigation plans, identify problem area specifically in the Zone A along roads throughout the watershed. Make every effort to ensure stormwater discharges and run-off is detained prior to release to protection areas. Consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of tributaries and the reservoirs.
- ✓ If local controls do not regulate floor drains, encourage communities to adopt floor drain controls and hazardous waste management strategies.
- ✓ Request that local highway departments inspect, and maintain drainage areas.
- ✓ Once the forest management plan has been approved, implement the plan to establish/maintain a healthy and ideal watershed forest, which will buffer anthropomorphic and natural environmental impacts on water quality and quantity.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues, above and in Appendix A.

**➤ Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

**➤ Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to water supply contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

**➤ Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the source protection areas are located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

**➤ Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use and regulations related to watershed protection. These controls may include health regulations, discharge prohibitions, general ordinances, and zoning by-laws/ordinances that prohibit or control potential sources of contamination within the protection areas.

**➤ Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>.

One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

The Department's Source Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, each spring DEP posts a new Request for Response for the grant program (RFR). Visit the DEP <http://www.state.ma.us/dep/brp/mf/othergrt.htm> and <http://www.state.ma.us/dep/brp/dws/grants.htm> for information about available funds.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help establish local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to establish priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendix**

### **A. Protection Recommendations**

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>Partial</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue to pursue ownership or control of land critical to protection such as the Zone A.
Is the Zone A posted with "Public Drinking Water Supply" or "No Trespassing" signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue regular inspections of drinking water protection areas. Increase patrols as appropriate and develop a plan to control access in critical areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, Ordinances and General Bylaws)		
Do the watershed municipalities have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>YES</b>	Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations to be sure by-laws are current with regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Request that the municipalities of Whately and Conway review their bylaws for compliance with 310 CMR 22.20C and request that they adopt them as appropriate. Work with the community to review development within the watershed.
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>YES</b>	Update the Plan as appropriate to address newly identified threats, inventories that may not been included and to adjust protection priorities as tasks are completed such as the stormwater management plan and the forest management plan and correct errors in the current plan
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Update plan as appropriate by developing a joint emergency response plan with the Fire Department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. Complete vulnerability assessment as appropriate for the system.
Does the municipality have a watershed protection committee?	<b>NO</b>	Consider establishing a committee that includes representatives from citizens' groups, host communities, and the business community.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . There are no registered generators of hazardous waste in the watershed.
Does the PWS provide watershed protection education?	<b>YES</b>	Continue efforts to provide information about BMPs to residents.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
THE WOK



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	The Wok
<b>PWS Address</b>	723 Greenfield Rd
<b>City/Town</b>	Deerfield, Massachusetts
<b>PWS ID Number</b>	1074008

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well	1074008-01G	167	463	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

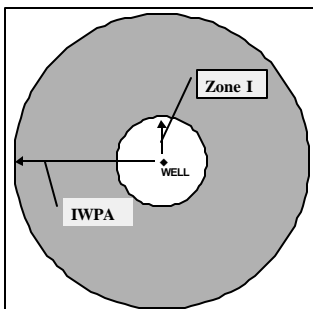
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well  
(1074008-01G)**

Zone I = 167 ft.  
IWPA = 463 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I. The **high** susceptibility to potential non-microbial threats is based on the parking, State Route 5 and a lumber facility within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by your operator on a Public Water Supply Annual Statistical Report form, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Easthampton Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Easthampton Water Department
<i>PWS Address</i>	109 Hendricks Street
<i>City/Town</i>	Easthampton
<i>PWS ID Number</i>	1087000
<i>Local Contact</i>	Mr. Thomas Newton
<i>Phone Number</i>	413-529-1422

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*System Susceptibility*

*High*

*Recharge Area = MA GIS Zone II ID # 564 and # 201*

*Susceptibility: High*

<i>Source Name:</i>	<i>Source ID</i>
Maloney Well	1087000-07G

*MA GIS Zone II ID# 235*

*Susceptibility: High*

<i>Source Name:</i>	<i>Source ID</i>
Hendrick Street Wellfield	1087000-04G
Pines Well	1087000-05G
Nonotuck Park Well	1087000-08G
Brook Street Well	1087000-09G

Easthampton is a small, residential and industrial city in the Connecticut River valley of western Massachusetts. The Easthampton Water Department utilizes water entirely from ground water sources within the Barnes Aquifer. The Barnes Aquifer has been designated as a Sole Source Aquifer by the Environmental Protection Agency. The Hendricks Street Wellfield, the oldest component of the system, was developed in 1908, consists of 106 driven wells of various depths and has an approved withdrawal rate of 1.2 million gallons per day (MGD). The Pines Well, built in 1962, is a 10-inch gravel developed well, with an approved withdrawal rate of 1 MGD. The Pines Well (05G) is located approximately 150 feet from the western portion of the Hendrick Street Wellfield (04G). The Nonotuck Park Well (08G) is a replacement well for the original Nonotuck well, which is now listed as an emergency source only. The replacement well went on line in 1995 and is an 18 by 24-inch diameter gravel packed well with an approved withdrawal rate of 1.14 MGD. The Brook Street Well (09G) was completed in 1998 in the central part of town and is a 24 by 36-inch diameter, gravel packed well with an approved yield of 1.2 MGD withdrawal. The Zone I for the Hendrick Street wellfield is a radial distance of 250 feet from the outer perimeter of the wellpoints resulting in an oval shaped Zone I. The remaining wells each have a Zone I radius of 400 feet. The Pines Well, Brook Street, Hendrick Street and Nonotuck Park sources are located within approximately 1 mile of each other and the Zone II (#235) includes all of those sources. Please refer to the Zone II map.

The Maloney Well is located approximately 2 miles north, (downgradient) of the other Easthampton sources. The Maloney Well is an 18-inch diameter, gravel developed artesian well installed in 1976 with an approved withdrawal rate of 1.7 MGD. Due to high manganese levels, the Maloney Well is used primarily to supplement the system under high demand. The Zone II for the Maloney Well was delineated as part of the SWAP program. The Zone II (#564) for the Maloney well incorporates a large area as it is at the mouth of three buried valley aquifers that merge and discharge to the Connecticut River valley just east of the Maloney Well site. The Maloney well also has a Zone I radius of 400 feet.



The aquifer utilized by Easthampton is part of the Barnes Aquifer, an extensive sand and gravel aquifer that has been designated by the EPA as a “Sole Source Aquifer”. The aquifer extends through Holyoke, Westfield, Southamptton and Easthampton. The regional Barnes Aquifer Protection Committee consists of representatives of each of the communities, academia and the regional planning agency to promote education about and protection of the aquifer on a regional basis. As noted, the contribution area for the Maloney well is quite extensive due to the well’s location downgradient of the convergence of three large, buried valley aquifers that discharge to the Connecticut River valley near the Oxbow. The recharge area includes an aquifer that flows from the northwest and merges with the Barnes aquifer before discharging to the Connecticut River basin. The aquifers are glacially deepened bedrock valleys that were filled with sand and gravel during the glacial recession (melting) some 10,000 years ago. Glacial Lake Hitchcock was formed throughout much of the Connecticut River valley leaving some areas with an extensive clay confining unit. The Maloney well is located in an area that has a thick, confined clay layer above the sand and gravel aquifer utilized by that well. However, the confining clay unit thins out near the boundaries of the valley and does not exist to the south and west of the Maloney well. The confining unit does underlie much of the center of Easthampton, the most densely developed section of the Zone II.

Although some portions of the aquifer are protected from activities and land use on the ground surface by the clay layer, the aquifer is considered to be highly vulnerable to contamination because the hydrogeologic barrier (i.e. clay) is not continuous throughout the developed recharge area. Please refer to the attached map to view the boundaries of the Zone II.

Water from the Pines Well and Hendrick Street Wellfield is treated by aeration to remove Trichloroethylene (TCE) an industrial solvent, then chlorinated for disinfection prior to distribution. An extensive, on-going investigation of the contamination has been conducted by the Department and the City. For further information about that investigation, contact the Department’s Bureau of Waste Site Cleanup at the Springfield Office at (413) 784-1100. For current information on monitoring results and treatment

processes, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

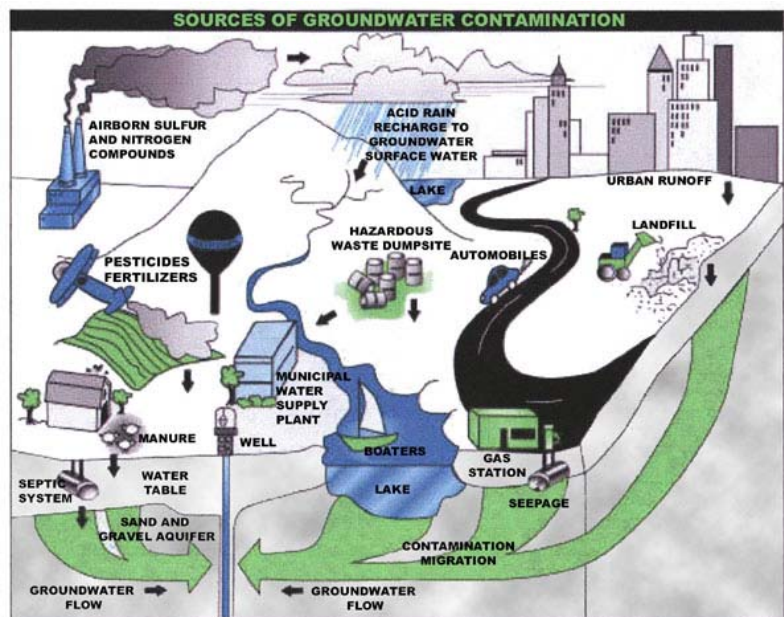
The Zone II areas for Easthampton’s water supplies are a mixture of residential, agricultural, commercial, and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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**Key Land Uses and Protection Issues include:**

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Confirmed oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning
7. Agricultural activities
8. Wastewater Treatment Facility
9. Right-of-Way

The overall ranking of susceptibility to contamination for the system is high, based on the presence of several high threat land uses within the water supply protection areas, as seen in Table 2.

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**1. Non-conforming Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. The Zone I for the wellfield is a 250 foot radial distance from the perimeter of the well points. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads as well as other land not owned by the water supplier. Wells 06G and 08G have only recreational activities within the Zone I. The Zone Is for sources 04G and 05G are not entirely owned or controlled by the water supplier and contain residential areas and roadways as well as a sewer line and storm drain. The residential area is served by public sewers; the sewer lines and storm drains that run through the Zone I area are sleeved to protect the aquifer from leaks. Although the City does not own the entire Zone I of source 09G, there is a Conservation Restriction on that land. The Zone I for the Maloney well includes a small area that was previously owned by and utilized by an industry. The City currently owns the parcel, including the Zone I area and has recently received a Brownsfield grant to investigate the site. Although only a very small area of the site lies within the Zone I, the remainder of the parcel lies within the Zone II of the Maloney well. In addition to the activities associated with the industry, there is a wellfield, outside of the Maloney Well Zone I that was utilized by the facility. The field is only partially intact but little is know about the wellfield. According to the City Planner, further investigations and

recommendations regarding the site are forthcoming. For further information regarding the area, contact the City Planning Department.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt or any other chemicals within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Contact the property owners to be sure they are aware that they are within the Zone I and Zone II of the well(s). Provide information about BMPs.
- ✓ Consider options for future acquisitions of land.

*(Continued on page 8)*

**Source Protection Decreases Risk**

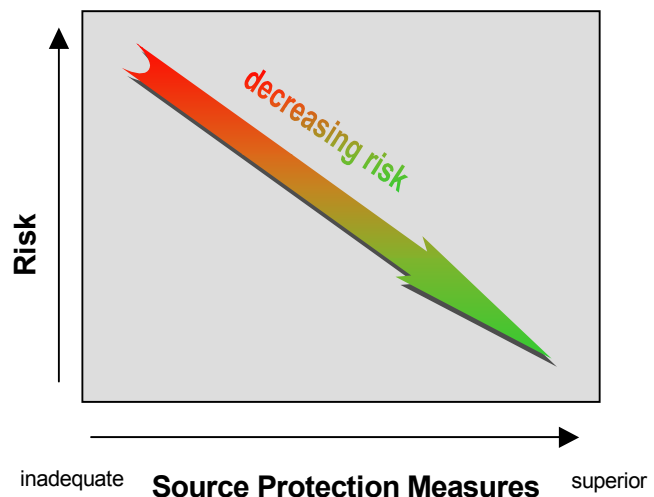


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II	Potential Contaminant Sources*
<b>Agricultural</b>				
Fertilizer/Pesticide Storage or Use Orchards/crops	Numerous	M	Both	Fertilizers/Pesticides: leaks, spills, improper handling, or over-application
Dairy Farm	2	M	564	Manure (microbial contaminants): improper handling
Livestock Operations other than dairy	Numerous	M	Both	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	Numerous	H	Both	Manure (microbial contaminants): improper handling
Forestry Operation—Sawmill	1	M	564	Equipment maintenance
<b>Commercial</b>				
Body Shops	3	H	Both	Vehicle paints, solvents, and primer products: improper management
Gas Stations	6	H	Both	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops/ Excavating/Construction Companies	16	H	Both	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	Both	Fuels and maintenance chemicals: spills, leaks, or improper handling
Cemeteries	6	M	Both	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	H	Both	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	5	L	Both	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	1	M	564	Fertilizers or pesticides: over-application or improper handling
Laundromats	2	L	Both	Wash water: improper management

Table 2 Continued

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Printer And Blueprint Shops	2	M	Both	Printing inks and chemicals: spills, leaks, or improper handling or storage
Repair Shops (small engine and appliances)	2	H	Both	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Medical Facilities	8	M	Both	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	3	M	Both	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Industrial</b>				
Asphalt and Concrete Plants	2 Asphalt, 1 Concrete	M	Both	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Fuel Oil Distributors	3	H	Both	Fuel oil: spills, leaks, or improper handling or storage
Furniture stripping/ refinishing	1	H	564	Hazardous chemicals: spills, leaks, improper handling or storage
Hazardous Materials Storage	Numerous	H	Both	Hazardous materials: spills, leaks, or improper handling or storage
Lagoons and Pits	1 (Closed)	-	564	Liquid wastes: improper seepage or overflows
Industry/Industrial Parks	1	H	564	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/Metalworking Shops	10	H	Both	Solvents and metal tailings: spills, leaks, or improper handling
Plastic Processors	2	H	Both	Solvents, resins and process wastes: spills, leaks, or improper handling or storage
RCRA TSDF Facilities	Numerous	H	Both	Hazardous wastes: spills, leaks, or improper handling or storage
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous USTs	H	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aboveground Storage Tanks	Numerous	M	Both	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Present	L	Both	Microbial contaminants
Landfills	3 (1 Active)	H	564	Potential for seepage of leachate

Table 2 Continued

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
<b>Miscellaneous</b>				
Large Quantity Hazardous Waste Generators	Numerous	H	564	Hazardous materials and waste: spills, leaks, or improper handling or storage
NPDES Locations	1	L	564	Hazardous material and wastes: improper disposal
Confirmed Oil or Hazardous Material Release Sites	18	--	Both	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	1	M	Both	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools	3	M	Both	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small quantity hazardous waste generators	Numerous	M	Both	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Numerous	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
<u>Electric/Natural gas</u> - Line Rights-of-Way	2	L	Both	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or im-
Underground Storage Tanks	Numerous (>)	H	Both	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	2	L	Both	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	Numerous	L	Both	Hazardous materials and waste: spills, leaks, or improper handling or storage
Wastewater Treatment Plant/Collection Facility/ Lagoon	1	M	564	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management
Water Treatment Sludge Lagoon	1	M	Both	Sludge and wastewater: improper management
Junk/Salvage Yard	5	H	564	Automotive chemicals, waste, and batteries: spill, leaks or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

*(Continued from page 4)*

**2. Residential Land Uses** – Approximately 30% of the Zone II #235 consists of residential areas; the other Zone IIs have about 23% of land utilized as residential. While much of the Zone II area located within Easthampton is served by the municipal sewer system, all of the Southampton areas and most of the Northampton areas use on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Continue proactive inspection of areas within the Zone II and continue supporting the removal of USTs and upgrading of septic systems or connection to the municipal sewer. Be sure communities are aware that they can utilize municipal incentive programs to fund removal of USTs, upgrade septic systems as well as remove lead paint from residential properties.

**3. Transportation Corridors** – Many state routes run through the Zone IIs of the wells. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone IIs.
- ✓ Work with the Town and State to have catchbasins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams in Northampton, Holyoke and Northampton to ensure that any spills

within the Zone IIs can be effectively contained.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Notify City and town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).

**4. Hazardous Materials Storage and Use** – A small percentage of the land area within the Zone IIs is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST (see Appendix B for a list of registered facilities). If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with the Board of Health and local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Work with your local fire department and the Board of Health to review emergency response plans and to coordinate response actions.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone IIs



contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0000549, 1-0000129, 1-0000291, 1-0013737, 1-0000264, 1-0011448, 1-0000674, 1-0012049, 1-0000064, 1-0000066, 1-0013515, 1-0000608, 1-0000512, 1-0013956, 1-0012881, 1-0000514, 1-0011448, 1-0000264, 1-0000639, and 1-0000723. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites. Contact the Bureau of Waste Site Cleanup for further information regarding those sites.

**6. Agricultural Activities** – There are several farms within the Zone IIs. Approximately 20% of the land use within each of the Zone IIs is cropland and pastureland. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources

**Top 5 Reasons to  
Develop a Local Wellhead  
Protection Plan**

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased groundwater monitoring and treatment
- Water supply clean up and remediation
- Replacing a water supply
- Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water is a place people want to live and businesses want to locate.

- ✓ Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ Commercial facilities may be eligible for funding BMPs through the Department of Food and Agriculture or the Work and NRCS. Contact the NRCS about the Environmental Quality Incentives Program (EQIP).

**7. Protection Planning** – Currently, although the City has water supply protection controls, the entire Zone II and recharge areas are not protected by controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials in Northampton and Southampton to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). Work through the Barnes Aquifer Protection Committee and with the DEP to encourage all host communities to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with the Barnes Aquifer Protection Committee, DEP and the local boards to review if all communities regulate floordrains; be sure to include floordrain controls that meet 310 CMR 22.21(2).

**8. Wastewater Treatment Plant** – The Zone II contains the Easthampton Wastewater Treatment Plant that discharges to the Connecticut River near Interstate I-91 in Easthampton. The facility also has a wet weather discharge within the Zone II of the Maloney well. However there is a confining clay layer in that vicinity. Activities associated with wastewater treatment involve storage and use of hazardous materials such as chlorine and fuel oil. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Spills, leaks or mismanagement of wastewater, hazardous materials and storm water at the plant is a potential source of contamination.

**Wastewater Treatment Plant Recommendations:**

- ✓ Ensure wastewater treatment facility is operated and maintained according to DEP requirements.
- ✓ Work to have stormwater drains and the drainage system around the wastewater treatment plant mapped.
- ✓ Work with plant to be sure that best management practices are used for proper handling of materials and in containing spills and leaks.
- ✓ Work with plant to be sure emergency planning includes notification for Easthampton Water Department.
- ✓ Ensure that the all of the plant’s storage tanks have containment and are maintained and monitored properly.

**9. Right-of-Way** – There are three different utility rights of way within the Zone IIs: natural gas, electric and sewer pipeline. The risk for the sewer pipeline is from a possible rupture of the line, potentially allowing the contents to enter into the water supply. Normal maintenance of any right-of-way, including electrical line rights-of-way, can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides is a potential source of contamination.

**Right-of-Way Recommendations:**

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

**Additional Information**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP’s Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, City and abutting community boards.



- ✓ Review the natural gas pipeline and electricity right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utilities use, and provide them with up-to-date maps if necessary.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the utility rights-of-way and coordination with the owner/operator of the utilities using the right-of-way.
- ✓ Continue working with the DPW regarding maintenance of the sewer line and storm drains.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about some of these land uses. One issue that the city has been aware of and has been tracking is the number of non-commercial USTs within the aquifer. As noted in Appendix B, there are approximately 275 USTs in the aquifer in Easthampton. This does not include those in other communities within the aquifer. Easthampton has been tracking the progress of the removal of these tanks. Continue tracking USTs and consider funding options for assisting in the removal of the tanks.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Sleeved sewer lines
- Sleeved storm drains
- Active participation in the Barnes Aquifer Protection Committee
- Inventorying and actively supporting removal of USTs in the Barnes Aquifer.
- Proactive and knowledgeable about activities within the Zone II areas and pursue mitigation of threats

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue working with the Aquifer Protection Committee and through other effort, to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Continue your partnership with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Coordinate and implement a plan for Easthampton and surrounding communities to remove underground storage tanks to protect the unconfined aquifer from contamination.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Work with the City Planning Department to target and prioritize assessment of properties within the Zone II.
- ✓ Continue working with the Board of Health to conduct inspections and implement hazardous materials strategies.
- ✓ Continue efforts to encourage other municipalities to protect the aquifer.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, include adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning by laws that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b> (except 04G)	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Pursue acquiring control of Zone I lands not owned by the supplier by purchase or conservation restriction.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone I regularly inspected?	<b>YES</b>	Continue monthly inspections of drinking water protection areas. Increase frequency when possible.
Are water supply related activities the only activities within the Zone I?	<b>YES</b> (05G, 07G, 09G) <b>NO</b> (04G, 06G, 08G)	Continue monitoring activities in Zone I. Consider Right of first refusal, purchase of conservation restriction, etc.
<b>Municipal Controls</b> (Zoning Regulations, Health Regulations, and General Ordinances/By laws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>YES</b>	The City’s Zoning Ordinance meets DEP’s wellhead protection requirements. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model by laws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>PARTIAL</b>	Holyoke, Westfield and Easthampton have wellhead protection ordinances. Work with Northampton to include your wellhead protection areas in their water supply protection controls. Request that Southampton to implement protection and include Easthampton’s Zone II. Contact the Town Boards and the BPAC. DEP may be of assistance to you.
<b>Planning</b>		
Does the PWS have a local Wellhead Protection Plan?	<b>NO</b>	Work with the Barnes Aquifer Protection Committee to create comprehensive watershed plans. For more guidance, follow “Developing a Local Wellhead Protection Plan” and other guidance available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens’ groups, neighboring communities, and the business community as committee members.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	Easthampton does have a floor drain regulation. Other communities may not. For more guidance, see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>PARTIAL</b>	Aim education efforts at schools and commercial, industrial, and municipal uses within the Zone II. Work through BPAC to access host communities.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
130782	Tubed Products, Inc.	44 O'Neil Street	Easthampton	Hazardous Waste Generator	Large Quantity	Industry
				Oil Waste Generator	Small Quantity	
				Air Handler	Major (BM1000)	
130780	National Nonwovens	180 Pleasant Street	Easthampton	Hazardous Waste Generator	Small Quantity	Industry
				Air Handler	Minor Synthetics (SM150)	
				Oil Waste Generator	Very Small Quantity	
26963	National Nonwovens	Mechanics Street	Easthampton	Hazardous Waste Generator	Small Quantity	Industry
				Air Handler	Minor Synthetics (SM150)	
				Toxic User	Large Quantity	
				Oil Waste Generator	Small Quantity	
25961	The October Company, Inc.	O'Neil Street	Easthampton	Hazardous Waste Generator	Small Quantity	Industry
				Oil Waste Generator	Very Small Quantity	
				Air Handler	Major Synthetics (SM1000)	

				Toxic User	Large Quantity	
133906	Gazette Printing Company, Inc.	58 O'Neil Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Printers
27990	Peter Rapid Cleaners	38 Union Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Dry Cleaners
31055	A & B Auto Sales	156 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Sales & Repair
				Oil Waste Generator	Very Small Quantity	
133907	Rock Valley Tool, Inc.	54 O'Neil Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	
				Oil Waste Generator	Small Quantity	
35459	Fedor Oldsmobile Pontiac, Inc	228 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Sales & Repair
				Oil Waste Generator	Small Quantity	
130785	The October Company, Inc.	51 Ferry Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Industry
				Oil Waste Generator	Very Small Quantity	
				Toxic User	Large Quantity	
				Plant	RES Application Approved	
36572	The Town of Easthampton	30 Northampton Street	Easthampton	Hazardous Waste Generator	Small Quantity	
10018	Easthampton DPW	30 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Town DPW

				Oil Waste Generator	Small Quantity	
132014	Cernak Buick, Inc.	102-104 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Sales & Repair
37256	M & L Plastics	50 Terrace View	Easthampton	Hazardous & Oil Waste Generators	Very Small Quantities	Plastic Manufacturing
130781	Phillip Manufacturing Company	19 Ward Avenue	Easthampton	Air Handler	Minor (BM450)	Manufacturing
130786	Easthampton Dye Work	1 Cottage Street	Easthampton	Air Handler	Minor (BM150)	Industry
132648	Industrial Properties	1 Ferry Street	Easthampton	Plant	RES Application Approved	Industrial Park
50669	Riverside Industries	1 Cottage Street	Easthampton	Air Handler	Minor (BM150)	Industry
				Oil Waste Generator	Very Small Quantity	
135711	Pride Convenience, Inc.	60 Union Street	Easthampton	Oil Waste Generator	Very Small Quantity	Service Station
				Fuel Dispenser	Fuel Dispenser	
954	Easthampton Water Treatment Plant	90 Ferry Street	Easthampton	Surface Water Discharge (NPDES)	Major	Wastewater Treatment
				Oil Waste Generator	Very Small Quantity	
126211	Easthampton Mobil	124 Northampton Street	Easthampton	Fuel Dispenser	Fuel Dispenser	Gas Station
132647	Easthampton Landfill	Oliver Street	Easthampton	Landfill	Solid Waste	Landfill
178246	7-Eleven #22397	97-101 Union Street	Easthampton	Fuel Dispenser	Fuel Dispenser	Gas Station/ Convenience Store



				Hazardous Waste Generator	Small Quantity	
137001	Main Street Service	317 Main Street	Easthampton	Fuel Dispenser	Fuel Dispenser	Service Station
132015	Magnat Corporation	52 O'Neil Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Industry
205565	Stonington Corporation	45 Ferry Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Industry
136998	M & M Fuel Company	19 Parsons Street	Easthampton	Handler	BLW-HW	Fuel Distributor
132013	JPS Elastomerics Corporation	412 Main Street (Route 10)	Easthampton	Surface Water Discharge (NPDES)	Minor	
275434	Joseph J. Knapik	25 Mount Tom Avenue	Easthampton	Toxic User	TURP	
328235	October Company, Inc. – Chemetal Division	39 O'Neil Street	Easthampton	Air Handler	Minor Synthetics (SM150)	Industry
				Oil Waste Generator	Very Small Quantity	
				Hazardous Waste Generator	Very Small Quantity	
333062	Eastworks LLP	116 Pleasant Street	Easthampton	Air Handler	BM1000	Industry
343983	Cottage Street Motors, Inc.	47 Cottage Street	Easthampton	Fuel Dispenser	Fuel Dispenser	Service Station
				Oil Waste Generator	Very Small Quantity	
344531	Yankee Plastics, Inc.	142 Pleasant Street	Easthampton	Air Handler	Minor (BM150)	
				Hazardous Waste Generator	Very Small Quantity	

345410	Palmer Paving Corporation	23 Arthur Street	Easthampton	Air Handler	BM1000	Asphalt Manufacturer
				Hazardous Waste Generator	Small Quantity	
364135	Easthampton East Street Landfill	East Street	Easthampton	Landfill	Non-notifier	
*MV4135270800	Advance Auto #1367	112 Union Street	Easthampton	Oil Waste Generator	Small Quantity	Auto Repair
*MAV000002622	Bay State Auto Body	15 Pleasant Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Body
*MAV000002886	Burt Ford Tractor, Inc.	1 Lovefield Street	Easthampton	Oil Waste Generator	Very Small Quantity	Tractor Sales
*MAV000001319	D & D Auto Parts and Machines	9 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Engine Repair
**MAD982754673	Dietz Construction Corporation	134 Lovefield Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Construction Company
*MAV000013447	Dr. James Hayden, DVM	410 Main Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Veterinarian
*MAV000009101	Dr. Joseph Zilewicz	5 Campus Lane	Easthampton	Hazardous Waste Generator	Very Small Quantity	Medical Facility
*MAV000002683	Dr. Thomas M. Cleary	350 Main Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Medical Facility
*MV4135271232	E S P Auto	15 Pleasant Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	
*MAV000018383	Easthampton Tire Outlet	141 Northampton Street	Easthampton	Oil Waste Generator	Very Small Quantity	
*MAV000016095	Hampshire Chrysler - Plymouth	150 Northampton Street	Easthampton	Oil Waste Generator	Small Quantity	Auto Sales & Repair
*MAV000015929	John T. Simone	29 Carillon Circle	Easthampton	Hazardous Waste Generator	Very Small Quantity	

**MAD000842724	JPS Elastomerics Corporation	412 Main Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Industry
*MAV000015108	K & M Cycle	97 Glendale Street	Easthampton	Hazardous and Oil Waste Generators	Very Small Quantities	Cycle Sales and Repair
*MAV000017898	Main Street Service	317 Main Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Repair
*MAV000001950	Matt's Garage	61 South Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Auto Repair
				Oil Waste Generator	Small Quantity	
*MV4135273445	National Nonwovens, Putnam Plant	110 Pleasant Street	Easthampton	Hazardous & Oil Waste Generators	Very Small Quantity	Industry
**MAD982202277	Nick's Auto Body	2 Hill Avenue	Easthampton	Hazardous Waste Generator	Very Small Quantity	Body Shop
*MV4135275401	Nick's Auto Body, Inc.	164 Northampton Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	Body Shop
**MAD981206980	Paramount Auto Body	51 Holyoke Street	Easthampton	Hazardous and Oil Waste Generators	Very Small Quantities	Body Shop
*MV4135270291	Richard's Fuel, Inc./ Richard's Plumbing & Heating	79 R Union Street	Easthampton	Hazardous and Oil Waste Generators	Very Small Quantities	
*MV4135273430	Strong Corporation	40 O'Neil Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	
				Oil Waste Generator	Small Quantity	
*MAV000008438	Sunset Motors	9 Florence Road	Easthampton	Oil Waste Generator	Very Small Quantity	
*MV4135272127	VCA, Inc.	1 Cottage Street	Easthampton	Hazardous Waste Generator	Very Small Quantity	
	Northampton Landfill	Glendale Road	Northampton	Landfill	Solids	Landfill

**MAD981892847	Joseph Misterka, Inc.	339 Westhampton Road	Northampton	Hazardous Waste Generator	Small Quantity	
*MAV000006205	Ames Department Store #0375	Townline Shops, College Highway	Southampton	Oil Waste Generator	Very Small Quantity	Department Store
*MAV000002851	Dr. Hans Beer, DMD	16 Pomeroy Meadow Road	Southampton	Hazardous Waste Generator	Very Small Quantity	Medical Facility
*MV4135271556	Easthampton Harley-Davidson	17 College Highway	Southampton	Hazardous Waste Generator	Very Small Quantity	Motorcycle Sales and Service
*MV4135271570	Johnson Metal Products	6 Line Street	Southampton	Oil Waste Generator	Very Small Quantity	Metal fabricator
*MV4135272000	Marmon/Keystone Corporation	1 Clark Street	Southampton	Hazardous & Oil Waste Generators	Very Small Quantities	
**MAD981061872	Mid Town Motors	151 College Highway	Southampton	Hazardous & Oil Waste Generators	Very Small Quantities	
*MAV000016910	Mohawk Machine Shop	37 Pleasant Street	Southampton	Hazardous Waste Generator	Very Small Quantity	Appliance Repair
	Skyline Screen Printing	15 Middle Street	Southampton	Hazardous Waste Generators	Very Small Quantity	Printer Shop
*MAV000006712	Southampton Family Chiropractor	166 College Highway	Southampton	Hazardous Waste Generators	Very Small Quantity	Medical Facility
**MAD991288549	Southampton Sanitary Engineering Company	168 County Road	Southampton	Hazardous & Oil Waste Transporters	Transporters	Waste Transport
*MAV000011536	Tom's Truck Repair Service	42 Whiteloaf Road	Southampton	Hazardous & Oil Waste Generators	Very Small Quantities	Truck Repair
**MAD000844720	Town of Southampton Landfill	Moosebrook Road	Southampton	Oil Waste Generator	Small Quantity	Landfill
**MAV000011082	Agway Distribution Center	323 Lockhouse Road	Westfield	Hazardous Waste Generators	Very Small Quantity	Distribution
178213 *MAD985297274	Westfield Electroplating Co	340 Lockhouse Rd	Westfield	Hazardous Waste Generators	Small Quantity	Electroplating

\* Massachusetts Identification Number

\*\* EPA Identification Number

\*\*\* Scheduled to be cleaned up

## Commercial Registered Underground Storage Tanks – U.S. Fire Service

This list does not include non-commercial and residential facilities. An inventory of the Barnes Aquifer Protection Area was conducted during the early 1990's and updated as the tanks are removed. According to that inventory, there still are nearly 275 USTs remaining in Easthampton not included in this table. This does not include those that may be located in Southamptton, Northampton and Holyoke.

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
180 Pleasant Street LLC	180 Pleasant Street	Easthampton		1 Wall	Interstitial Space Monitor	30000	Fuel Oil
7-Eleven #22397	97 Union Street	Easthampton	Convenience, Gas Station	1 Wall	Approved In-Tank Monitor	10000	Gasoline
				1 Wall	Approved In-Tank Monitor	10000	Gasoline
				1 Wall	Approved In-Tank Monitor	10000	Gasoline
Cernak Buick, Inc.	102 – 104 Northampton Street	Easthampton	Auto Sales	1 Wall	Approved In-Tank Monitor	2000	Gasoline
Cernak Fuel Corporation	Mountainview Street	Easthampton	Fuel Distributor	1 Wall	Approved In-Tank Monitor	30000	Fuel Oil
				1 Wall	Interstitial Space Monitor	10000	Fuel Oil
				1 Wall	Approved In-Tank Monitor	2000	Kerosene
				1 Wall	Approved In-Tank Monitor	2000	Gasoline
Cernak Fuel Corporation (continued)	Mountainview Street	Easthampton	Fuel Distributor	1 Wall	Approved In-Tank Monitor	10000	Diesel

				AST	--	275	Fuel Oil
				AST	--	300	Off Road Fuel
Easthampton Dye Works, Inc.	1 Cottage Street	Easthampton	Industry	2 Wall	Interstitial Space Monitor	10000	Fuel Oil
F.L. Roberts & Co., Inc. #415	124 Northampton Street	Easthampton	Industry	2 Wall	Interstitial Space Monitor	15000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	5000	Diesel
Fedor Oldsmobile Pontiac, Inc.	228 Northampton Street	Easthampton	Auto Sales	2 Wall	Approved In-Tank Monitor	4000	Gasoline
				2 Wall	Interstitial Space Monitor	2000	Fuel Oil
G & D Properties, Inc.	47 Cottage Street	Easthampton		1 Wall	Approved In-Tank Monitor	4000	Gasoline
				1 Wall	Approved In-Tank Monitor	8000	Gasoline
				1 Wall	Approved In-Tank Monitor	4000	Gasoline
				1 Wall	Approved In-Tank Monitor	8000	Gasoline
Main Street Service	317 Main Street	Easthampton	Service Station	1 Wall	Approved In-Tank Monitor	10000	Gasoline
				1 Wall	Approved In-Tank Monitor	8000	Gasoline
				1 Wall	Approved In-Tank Monitor	8000	Gasoline



National Nonwovens	23 Mechanic Street	Easthampton	Industry	1 Wall	Interstitial Space Monitor	10000	Fuel Oil
				1 Wall	Interstitial Space Monitor	10000	Fuel Oil
Pride Convenience, Inc.	60 Union Street	Easthampton		2 Wall	Interstitial Space Monitor	15000	Gasoline
				2 Wall	Interstitial Space Monitor	18000 (Dual Tank)	Gasoline/Diesel
Stanhome, Inc.	116 Pleasant Street	Easthampton		<i>Empty</i>	<i>Must be recertified</i>	20000	Fuel Oil
Strong Corporation	Lovefield Street	Easthampton	Industry	1 Wall	Approved In – Tank Monitor	10000	Diesel
Cumberland Farms	130 College Hgwy	Southampton	Gasoline Station	1 Wall	Approved In – Tank Monitor	8000	Gasoline
				1 Wall	Approved In – Tank Monitor	8000	Gasoline
				1 Wall	Approved In – Tank Monitor	8000	Gasoline
Southampton Highway	Fomer Road	Southampton	Highway Dept.	2 Wall	Interstitial Space Monitor	4000	Diesel
				2 Wall	Interstitial Space Monitor	4000	Gasoline
Xtra Mart	247 College Hgwy	Southampton	Gasoline Station	1 Wall	Approved In – Tank Monitor	4000	Gasoline
				1 Wall	Approved In – Tank Monitor	10000	Gasoline
				1 Wall	Approved In – Tank Monitor	10000	Gasoline
G & D	Cottage Street	Easthampton	Motor Sales			4000	Gasoline
						4000	Gasoline

						8000	Gasoline
						8000	Gasoline
Ultramar Petroleum, Inc.	Easthampton Road	Northampton				25000	Empty
Westfield Electroplating Co	340 Lockhouse Rd	Westfield	Industry	1 Wall		10000	Fuel Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site:  
<http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000549	Easthampton Road	Northampton	
1-0014504	150 Northampton Street	Easthampton	Oil
1-0000674	19 Liberty Street	Easthampton	
1-0012049	124 Northampton Street	Easthampton	Oil
1-0000064	32 Union Street	Easthampton	
1-0000066	Loudville Road	Easthampton	

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) Listed by Release Tracking Number (RTN)

*Continued*

1-0013515	Wemelko Way	Easthampton	Hazardous Material
1-0000608	101-109 Pleasant Street	Easthampton	
1-0000512	Arthur Street	Easthampton	
1-0012881	19 Parsons Street	Easthampton	Oil
1-0000514	13-15 Pleasant Street	Easthampton	
1-0000639	Off Hendricks Street	Easthampton	
1-0000723	Ferry Street	Easthampton	
1-0013737	82 Pequot Road	Southampton	Hazardous Material
1-0000264	6 Coleman Rd	Southampton	
1-0011448	247 College Hwy	Southampton	Oil And Hazardous Material
1-0013568	297 Apremont Highway	Holyoke	Hazardous Materials
1-0013736	94A Apremont Highway	Holyoke	Hazardous Materials
1-0013735	30 Dupuis Road	Holyoke	Hazardous Materials

For more location information, please see the attached map. The map lists the release sites by RTN. Refer to DEP BWSC for additional information.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for

## Egremont Water Department

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Egremont Water Department
<i>PWS Address</i>	133 Mt. Washington Road
<i>City/Town</i>	Egremont
<i>PWS ID Number</i>	1090000
<i>Local Contact</i>	Mr. Jack Muskrat
<i>Phone Number</i>	413-644-9614

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

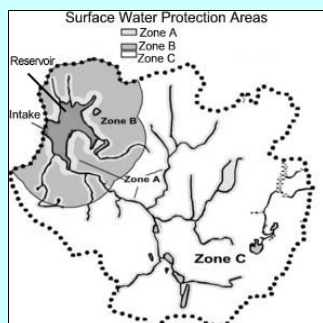
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

### Surface Water Sources

**Susceptibility:** Moderate

#### Source Name:

#### Source ID

Karner Brook Reservoir

1090000-01S

Egremont is a small rural residential community in the Berkshire hills of southwestern Massachusetts with the Egremont Water Department supplying drinking water to a small portion of the town. The Water Department maintains an intake structure on Karner Brook. The watershed of the Karner Brook Reservoir lies within the towns of Egremont and Mount Washington and a small portion within the state of New York. Approximately 86% of the watershed is protected through ownership by the Water Department or is part of the Taconic State Park in New York and the Mount Washington State Forest in Massachusetts. Greater than 90% of the land use within the watershed is as forested land. The remaining small percentage is residential and agricultural uses. Please refer to the attached map to view the boundaries of the protective zones.

Water from the brook is filtered through a slow sand filter and disinfected with chlorine prior distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies, the sources are considered highly vulnerable to potential contamination. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Residential land use in Zone A and watershed
2. Transportation corridors
3. Forestry/Watershed Management
4. Protection Planning
5. Water Treatment Facility

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 21 acres (2%) of the watershed consists of residential areas. None of the areas have public sewers, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. The closest use to the intake structure is a bridge constructed of treated timbers providing access to a resident. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic



systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Consider negotiating a Right of First refusal agreement or conservation restrictions for land not currently owned by the Town.
- ✓ Consider alternative access for this resident. If no alternative can be found, use BMPs for the crossing to prevent erosion and to protect from accidental release along this access.
- ✓ Inspect the bridge semi-annually. Review construction materials and consider materials that are not potential source of contamination in any reconstruction of bridge.

**2. Transportation Corridors** – There are many roads located throughout the watersheds, including many that are dirt roads. Though most are low-use roadways, the close proximity of some of the roads to the brook and typical roadway maintenance and use can pose a potentially significant source of

contamination from accidents and washouts along the dirt road. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater washed into catch basins and discharge into the reservoirs. The Conservation Commission required BMPs along the road close to the intake that include detention basins.

#### Transportation Corridor Recommendations:

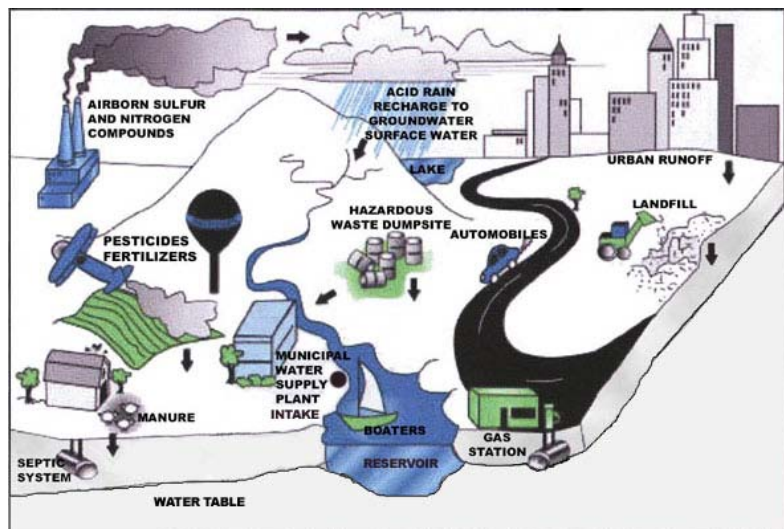
- ✓ Evaluate all options for management of access to local roads. Include evaluation of continuing current practice of full access, closing roads to all traffic (abandonment of road), closing road to all commercial traffic and limiting access to residents with a locked gate and key for residents only.
- ✓ Identify stormwater drains and the drainage system along the many local

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Figure 1: Sample watershed with examples of potential sources of contamination

roads in the watershed. Alternatively consider various strategies to detain/slow the flow and retain sediments for dirt roads within the watershed.

- ✓ Inspect, maintain, and clean catch basins and retention basins on a regular schedule.
- ✓ Work with local emergency response teams to ensure effective management of potential spills.
- ✓ Work with the resident to protect the water supply along the right-of-way.

**3. Forestry/Watershed management** – The majority of the watershed is not currently logged, but there is a potential for this practice to occur in the future. There is no watershed/forest management plan at this time. There is no evidence of significant aquatic wildlife such as beavers or muskrats in the watershed at this time.

- ✓ Include in the protection plan, an evaluation of the need for a forest inventory and forest management plan specifically designed for watershed management.
- ✓ Evaluate whether there are impacts associated with access and determine what, if any, management strategies are required for public access to the watershed.
- ✓ Continue to inspect the watershed regularly.
- ✓ Right of way maintenance should be conducted by mechanical means. Supply all utilities and road maintenance crews with detailed maps of the watershed area where they may be conducting maintenance. Meet with the staff in charge of conducting the maintenance and confirm all stream crossings and Zone A areas are accurately mapped.
- ✓ Continue contact with the DEM regarding activities within the watershed, specifically those related to access and forest operations.

**4. Protection Planning** – Currently, Egremont does not have a Watershed Protection District and Bylaw, which should be approved by DEP for compliance with water supply protection control regulations 310 CMR 22.21(2). A Watershed Protection Plan has not been prepared and submitted for approval



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

of content and procedures by the Department's Boston office. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The development of a successful Watershed Protection Plan is outlined in DEP's "Developing a Local Watershed Protection Plan" (see Appendix A for the full report).

#### Protection Planning Recommendations:

- ✓ Develop a Watershed Protection Plan that will focus on public access. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to review local watershed protection controls. If there are no local controls or they do not meet the current regulations, adopt controls or strategies that will meet 310 CMR 22.21(2) and protect the source. For more information on DEP land use controls see <http://mass.gov/>

#### Source Protection Decreases Risk

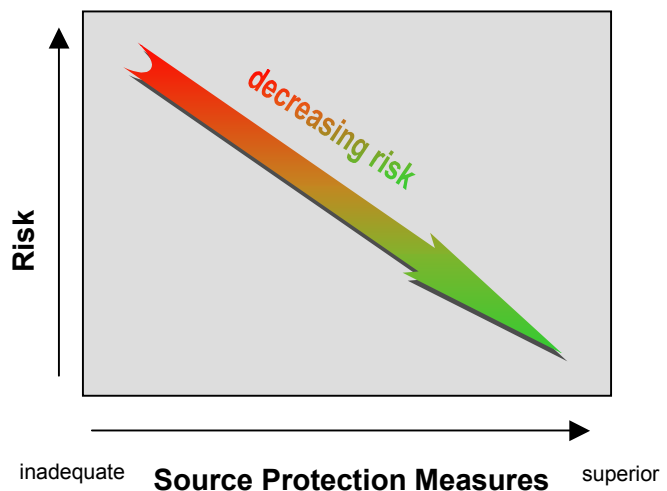


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Forestry Operation	Historical, DEM	L	Leaks, spills, or improper handling of hazardous materials, erosion. No current logging.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides/Fertilizers: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Clandestine Dumping	Historical	M	Debris may contain hazardous materials or wastes
Fishing	Numerous (in brook)	L	Debris, microbial contaminants
Tire Dumps	1 (small)	M	Tires: improper handling or management
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Transformers: Pole Mounted	Numerous	L	MODF spills from accidents, potentially PCBs in older transformers
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

dep/brp/dws/protect.htm.

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**5. Water Treatment Facility** - The Egremont water treatment facility is located within the Zone A of the source. Activities associated with water treatment involve storage and use of hazardous materials such as chlorine, sodium hydroxide. All chemicals are stored above ground and within secondary containment. According to the watershed protection plan, storm water from the facility discharges outside of the watershed. Spills or leaks of hazardous materials during handling and delivery and storm water are a potential source of contamination.

**Water Treatment Facility Recommendations:**

- ✓ Ensure water treatment facility is operated and maintained according to DEP requirements.
- ✓ Ensure stormwater drains and the drainage system around the treatment plant do drain outside of the watershed. Maintain catchbasins as necessary.
- ✓ Continue current use of best management practices for proper handling of materials and in containing spills and leaks.
- ✓ Update emergency plans as necessary.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains

#### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Maintaining high awareness of the watershed

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watershed and to cooperate on responding to spills or accidents.
- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a best management practices for residential and recreational uses.
- ✓ Develop and implement Forest Management Plan and a Watershed Management Plan for water supply protection.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source

protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring, about May 1, the Department posts a new Request for Response (RFR- the grant application form) for the grant program.

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Additional Documents on Source Protection

### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.



**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>NO</b>	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Make every effort to obtain remaining Zone A land. Watershed lands have recently been purchased and will be protected from development.
Is the Zone A posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue monthly inspections of drinking water protection areas. Increase frequency when possible.
Are water supply related activities the only activities within the Zone A?	<b>NO</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20 C?	<b>NO</b>	The Town does not meet DEP’s best efforts for watershed protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with Mount Washington to develop a protective by-law and include Karner Brook watershed in the water supply protection controls.
<b>Planning</b>		
Does the PWS have a local Surface Water Protection Plan?	<b>NO</b>	Develop a surface water protection plan. Follow “Developing a Local Surface Water Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams and be sure they are aware of the watershed boundary areas.
Does the municipality have a watershed protection committee?	<b>NO</b>	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide watershed protection education?	<b>YES</b>	Aim additional education efforts at residents within the watershed and those using the watershed for recreation.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Erving Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Erving Water Department
<i>PWS Address</i>	12 Main Street
<i>City/Town</i>	Erving
<i>PWS ID Number</i>	1091000
<i>Local Contact</i>	Andrew Tessier
<i>Phone Number</i>	(978) 544-3636 x100

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

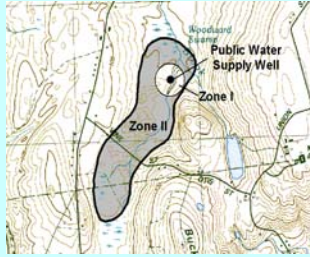
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**Zone II #:** 448

**Susceptibility:** High

Well Names	Source IDs
Well #1	1091000-01G

The Town of Erving is a small, rural community that began as manufacturing/industrial community along the Miller's River. Much of the community is hilly with the bulk of the development along the river valley. Erving Water Department is served by one well (1091000-01G). Well #1 is a 12 by 24-inch diameter, gravel packed well, 52-foot in depth. The well has an approved pumping rate of 260 gallons per minute (0.37 millions of gallons per day) based on an extended duration pumping test and historical pumping data. The Zone II, primary recharge area was delineated as part of the SWAP program. The well is located in an unconfined, stratified drift aquifer at the base of a delta of glacial origin. There is no evidence of a confining unit such as clay in the vicinity of the well. Wells located in this type of aquifer are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. The bedrock in the area is mapped as the Poplar Mountain gneiss formation of the Middle Paleozoic age; a dark-gray, well-foliated, micaceous gneiss of fairly complex composition. Please refer to the attached map to view the boundaries of the Zone II.

The water quality data from the well periodically shows fluctuating levels of sodium. There are multiple roads and two state highways located within the Zone II, with Route 2 located approximately 500 feet from the well. Sodium hydroxide is added to the water to buffer the pH for corrosion control prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Erving is a mixture of forest, residential, light agricultural and light commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Wastewater Treatment Plant
6. Oil or hazardous material contamination sites
7. Railroad Right-of-Way
8. Comprehensive wellhead protection planning
9. Agricultural Activities

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Nonconforming Zone I** – The Zone I for Well #1 encompasses a 400-foot radial area around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The Zone I for the well in this case includes two residences, a local road, and State Route 2 is just outside of the Zone I.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

**2. Residential Land Uses** – Approximately 23% of the Zone II consists of residential areas. Public sewer services most of the area, but there are still some septic systems in use within the Zone II. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

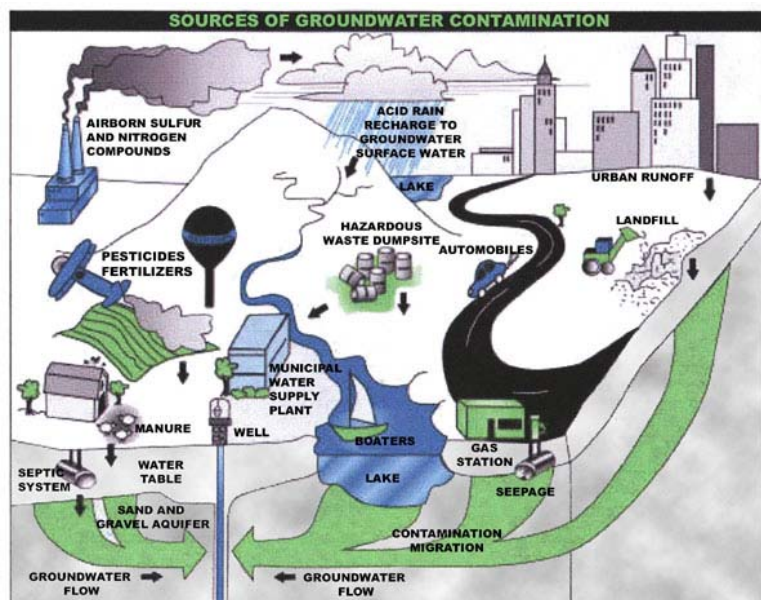
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office  
for more information on Source  
Protection and the Waiver  
Program.



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- residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Route 2 runs just outside of the Zone I and through the Zone II just east of the wells. Route 63 runs along the eastern boundary and has catchbasins that discharge into a brook flowing past the well. Local roads are common throughout the Zone II. Erving has water quality data demonstrating seasonally increased levels of sodium in the water supply. The Massachusetts Highway Department has designated Route 2 a low salt area, however, Route 63 is not.

Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites

for illegal dumping of hazardous or other potentially harmful wastes. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

**Transportation Corridor Recommendations:**

- ✓ Map local stormwater drains and the drainage system along transportation corridors; request a copy of Massachusetts Highway Department's maps and catch basin maintenance program. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. For instance, request the State Highway Department redirect the Route 63 and Route 2 catch basins to flow outside of the Zone II or remotely from the well. The storm drains from the northern section of Route 63 discharge through a swale to the brook flowing past the well. Contact the Clean State Initiative coordinator Rick Larson 413-755-2207 for assistance.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Hazardous Materials Storage and Use** – Two percent of the land area within the Zone II is commercial or

industrial land uses. Erving's Waste Water Treatment Plant is located on the western edge of the Zone II. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**Source Protection Decreases Risk**

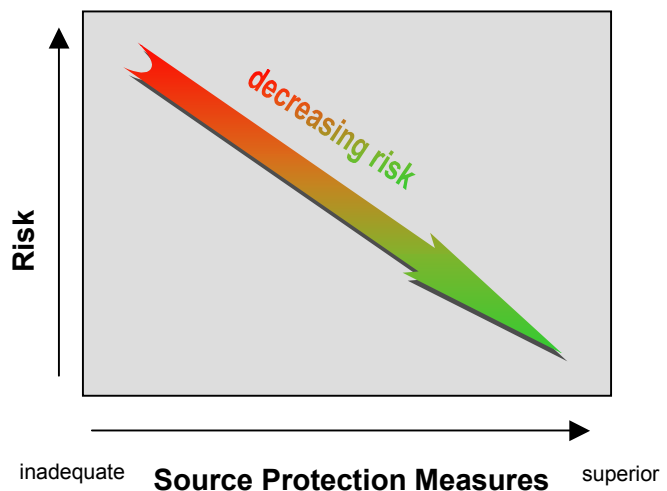


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Forestry Operation	Proposed	L	Erosion, equipment maintenance materials: leaks, spills, or improper handling; road building
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
<b>Commercial</b>			
Car/Truck/Bus Washes	1	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Bus and Truck Terminals	1	H	Fuels and maintenance chemicals: spills, leaks, or improper handling
Railroad Tracks	Throughout	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or
<b>Industrial</b>			
Hazardous Waste Storage, Treatment and	1	H	Hazardous materials: spills, leaks, or improper handling or storage

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	History of	L	Microbial contaminants
Fire Training Facilities	1	M	Fuels and other chemicals: improper use or storage
NPDES Locations	1	L	Hazardous material and wastes: improper disposal
Oil or Hazardous Material Sites	5	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
High School	1	L	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and deicing and other chemicals in stormwater from roads, parking lots, and lawns
Tire Dumps	1	M	Tires: improper handling or management
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	Numerous	H	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	Numerous	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	3	L	Hazardous materials and waste: spills, leaks, or improper handling or storage
Wastewater Treatment Plant/Collection Facility/	1	M	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper



between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**5. Wastewater Treatment Plant** – The Zone II contains the Erving Wastewater Treatment Plant that discharges immediately outside of the Zone II boundary into the Miller River. Activities associated with wastewater treatment involve storage and use of hazardous materials such as chlorine and fuel oil. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Spills, leaks or mismanagement of wastewater, hazardous materials and storm water at the plant is a potential source of contamination.

**Wastewater Treatment Plant Recommendations:**

- ✓ Ensure wastewater treatment facility is operated and maintained according to DEP requirements.
- ✓ Work to have stormwater drains and the drainage system around the wastewater treatment plant mapped.
- ✓ Work with plant to be sure that best management practices are used for proper handling of materials and in containing spills and leaks.
- ✓ Work with plant to be sure emergency planning includes notification for Erving Water Department.
- ✓ Ensure that the plant's underground storage tank has secondary containment and maintained properly.

**6. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

**7. Railroad Right-of-Way** – The railroad runs through the entire Zone II. Rail corridors that serve passenger and/or freight trains are a potential source of contaminant due to chemicals released during normal use, track maintenance, and

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- ♦ Increased groundwater monitoring and treatment
- ♦ Water supply clean up and remediation
- ♦ Replacing a water supply
- ♦ Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water is a place people want to live and businesses want to locate.



accidents. Normal maintenance of a railroad right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on railroad right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train/track maintenance chemicals are also potential sources of contamination to the water supply.

**Railroad Right of Way Recommendations:**

- ✓ Review the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the railroad rights-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

**8. Protection Planning** - Currently, the Town does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR

22.21(2). However, a consulting firm is currently in the process of completing a Wellhead Protection Plan for Erving Water Department. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

**Protection Planning Recommendations:**

- ✓ Follow the recommendations detailed in the Zone II report and the plan when it is complete.
- ✓ Coordinate efforts with local officials to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Contact Catherine Skiba of the Springfield Office of the Department to assist the Planning Board and Board of Health in presenting a bylaw to the public and promulgating regulations.

**9. Agricultural Activities** – There are several non-commercial farms with crop lands within the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water sources.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Maintaining a high awareness of the activities within the watershed

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

#### **Additional Information**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

- or accidents.
- ✓ Request Massachusetts Highway Department to redirect the Route 63 catch basins to flow south out of the Zone II and those on Route 2 away from the well.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	Continue to request that the Planning Board and Selectmen present protective bylaws for adoption at Town Meeting. The Department can assist you in this effort.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	A consultant is currently working on a wellhead protection plan. Be sure that at a minimum, issues raised in this assessment are included in the plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, MA Highway, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community. Conservation Commission has volunteered to participate.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>SOME</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at commercial, industrial and municipal uses within the Zone II.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
32684	Commonwealth of Massachusetts DPW	Route 2	ERVING	Hazardous Waste Generator	Very Small Quantity	Highway Depot
1020	Erving Waste Water Treatment Plant	16 Public Works Blvd.	ERVING	Hazardous and Oil Wastes Generator	Very Small Quantity	Waste Water Treatment Plant
				Surface Water Discharge (NPDES)	Major	
32684	Massachusetts Highway Department	Route 2	ERVING	Non Permitted Action (Non-Notifier)	Requires change of use or permit	Maintenance Depot
				Hazardous Waste Generator	Very Small Quantity	
				Sludge	Landfill	
*MAV000003 260	Town of Erving DPW	River Road	ERVING	Oil Waste Generator	Small Quantity	Maintenance Depot

\*Massachusetts Identification Number

For information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0012574	Route 2	Erving	Oil
1-0000071	Route 2	Erving	
1-0010122	Route 2, East of French King Bridge	Erving	Oil
1-0001000	Route 2	Erving	Gasoline, Oil



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
ERVING TOWN OFFICES



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Erving Town Offices
<b>PWS Address</b>	Town Offices
<b>City/Town</b>	Erving, Massachusetts
<b>PWS ID Number</b>	1091004

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well # 1	1091004-01G	100	405	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

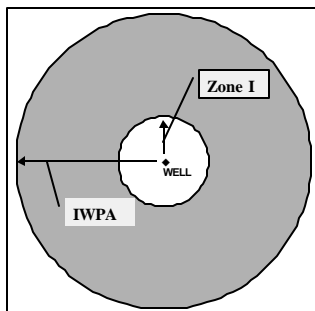
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #  
1 (1091004-01G)**

Zone I = 100 ft.  
IWPA = 405 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the parking, local roads, residences and other facilities within the Zone I and the IWPA.

This source water assessment report is based on information provided by you during a site visit, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted to the Department.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Source Water Assessment Program (SWAP) Report

## For

### Erving Paper Mills, Inc.



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
March 19, 2001

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Erving Paper Mills, Inc.
<i>PWS Address</i>	97 East Main Street
<i>City/Town</i>	Erving, Massachusetts
<i>PWS ID Number</i>	1091005
<i>Local Contact</i>	Environment and Process Engineer, Marguerite McCollett
<i>Phone Number</i>	978-544-2711 ext. 209

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well # 1	1091005-01G	182	478	High
Well # 2	1091005-02G	182	478	High
Well # 3	1091005-03G	150	448	High

## INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

#### The Wells

Erving Paper Mills, Inc. has been in the paper manufacturing business since approximately 1908. They produce food service paper products such as napkins utilizing 100% waste (recycled) paper and are one of the area's largest recycled paper users. The main Erving Paper Mill (the mill) utilizes river water for paper production. Wells 1 (01G) and 2 (02G) supply potable water to the mill and are located approximately 50 feet and 30 feet north of Route 2, respectively; the mill is immediately south of Route 2. Erving Paper Mills uses the wells alternately. There is a single master meter that does not distinguish between wells. Well 3 (03G), serves the currently inactive and vacant storage and shipping site, the former Usher Plant. The Usher Plant, which is owned by the same company and located approximately 1 mile west of the mill along Route 2 has been vacant since 1995. Well 3 is located approximately 5 feet north of the building and immediately south (approximately 50 feet) of an active railroad track.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Well 1, an 8-inch diameter well drilled to a depth of 485 feet below ground in 1977, extends above grade with its motor controls in a small shed near the wellhead. Well 2, a 6-inch diameter well drilled in 1941 to a depth of 238 feet, is located in a 5'x5'x6' concrete vault 200 feet west of Well 1. The wellhead (Well 2) is raised 24 inches above the vault floor. Well 3 is reportedly an 8-inch diameter well, drilled to a depth of 400 feet. The casing extends above grade and is set within a concrete well tile.

All three wells are bedrock wells. Geological maps of the area describe the bedrock as the Dry Hill Gneiss, a medium to fine grained granite-gneiss. Numerous bedrock outcrops are mapped in the immediate vicinity of the mill indicating shallow depth to bedrock. A large bedrock fault is mapped approximately 2,000 feet east of the mill wells separating the Dry Hill formation from the Crag Mountain Schist Formation. The bedrock aquifer utilized by the three Erving Paper Mills, Inc. wells has a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the ground surface into the aquifer.

Each of Wells 1 and 2 has a Zone I protective radius of 183 feet and an Interim Wellhead Protection Area (IWPA) radius of 478 feet. Well 3 has a Zone I radius of 150 feet and an IWPA radius of 448 feet. The Zone I and IWPA for Wells 1 and 2 are based on metered water usage data submitted by Erving Paper Mills, Inc. Since the storage facility is not active, the water usage and Zone I and IWPA for Well 3 are based on Title 5 septic system design flow volumes assuming the number of people that historically worked at the facility. Assessment information is presented in Tables 2 and 3.

Please refer to the attached maps of the Zone Is and IWPAs and Tables 2 and 3 for more information.

### The Water Quality

For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas for Erving Paper Mills, Inc. which are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

**Table 2: Table of Activities Common to the Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Paper Mill	Active Railroad track	Well 3	All Wells	High	Maintenance, and accidents pose a potential threat
	Parking lots and driveways	Well 3	All Wells	Moderate	Limit road salt usage and provide drainage away from wells
	Transportation corridor (Route2)	Wells 1&2	All Wells	Moderate	Road salt, spills and runoff
	Sewage pipelines/pump station	All Wells	All Wells	Moderate	Gravity and pressure mains
	Storm drains	All Wells	All Wells	Low	Road salt, spills and runoff

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

Key Land Use Issues for the Wells include:

1. Non-conforming Activities in the Zone Is;
2. Industrial facility (paper mill)
3. Sewage pipelines
4. Transportation corridor
5. Railroad Right-of-Way.

1. **Zone Is** – All three wells are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone Is for Wells 1 and 2 contain nearly all paper mill buildings and activities, a sewer line, storm drains and Route 2. The Well 3 Zone I contains mill buildings, sewers, storm drains, a railroad track and storage facilities. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I. Also please note, wells that have been inactive for greater than five years must come into compliance with Zone I requirements prior to being put back on line.

- ✓ **Recommendation:** Do not conduct any additional activities within the Zone I and continue your commendable and diligent monitoring of activities within Zone I, use of BMPs and training for emergency response. Contact MA DEP prior to conducting any activities within Zone I.

2. **Industrial Facility** - The Erving Paper Mill is an active industrial facility and currently holds DEP Bureau of Waste

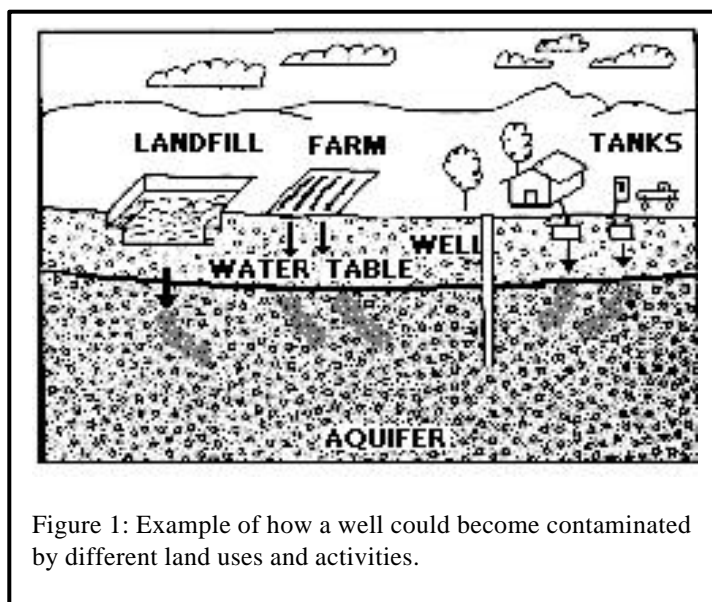


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**Table 3: Table of Activities Specific to Each Protection Area**

**Water Supply Protection Area for Wells 1 and 2**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Paper Mill	Large Quantity Toxics User	Both	Both	High	Hazardous materials are used in the processes
	Small Quantity Hazardous Waste Generator	Both	Both	Moderate	Non-water supply structures in Zone I
	USTs and hazardous materials storage	No	No	--	USTs and hazardous waste storage are outside of the IWPA

**Water Supply Protection Area for Well 3**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
	Lawns and parking	Yes	Yes	Moderate	Vegetation control, spills

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Prevention permits as a large quantity toxics user, small quantity hazardous waste generator, and air quality permittee. The entire area is sewered with the Publicly Owned Treatment Works (POTW) located immediately west of the mill. All of the facility's wastewater and one storm drain near the USTs is discharged to the POTW. The mill has a functioning waste recovery system on-site, contracts out hazardous waste disposal and is permitted to burn waste oil. Best Management Practices are used in the handling, storage, and shipping of the hazardous wastes. The hazardous waste storage facility and the fuel oil USTs at the mill are outside of the IWPA. The facility has a hazardous material emergency response plan that is periodically reviewed and updated as necessary and works cooperatively with the Town and local officials in coordination of water supply protection and emergency response.

✓ **Recommendations:** Continue reviewing and updating plans for emergency response and staff training regarding handling and management of hazardous materials. Continue the use of Best Management Practices.

3. **Sewage pumping station, pipelines and storm drains** – Gravity sewer lines, pumping station and storm drains are located within the Zone Is of the mill wells and the Usher Plant well. The storm drains direct runoff away from the wells and toward the river. The wastewater treatment plant and NPDES discharge locations are both topographically downgradient of the wells and outside of the IWPA. The POTW surface water discharge location is however upstream (1 mile) of the Usher Plant location. Well 3 is approximately 400 feet from the river.

✓ **Recommendations:** Maintain records of sewers and storm drains; continue monitoring the function of the sewerage pumping station.

4. **Railroad right-of-way** - The railroad track runs through the Erving Paper Mills, Inc. property and is within the IWPA of Wells 1 and 2 and the Zone 1 of Well 3. Rail corridors serving passenger and/or freight trains are potential sources of contamination due to chemicals released during normal use, maintenance, and accidents. Normal maintenance of a railroad right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. Accidents can release a variety of petroleum products and commercially transported chemicals.

✓ **Recommendations:** Be sure that the railroad is aware that you are a public water supply and consider incorporating rail accidents into your emergency response plan.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

Erving Paper Mill, Inc. should review and adopt the following recommendations at the facilities:

### Zone I:

- 3 Keep all new non-water supply activities out of the Zone I.
- 3 Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.



### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

- 3 Wells that have been inactive for greater than five years are required to meet Zone I restrictions prior to reactivation.
- 3 Consider well relocation if Zone I threats cannot be mitigated.
- 3 Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- 3 Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- 3 Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- 3 Continue your coordination with the DEP, State highway and local officials regarding diligence in protecting the water supplies through emergency response coordination.
- 3 Be sure that the railroad is aware that your facilities are public water supplies so that you can be notified of any accidents or threats from the railroad.
- 3 Secure the Usher Plant to discourage vandalism and further deterioration of the building.

### **Training and Education:**

- 3 Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, certified operator, and other appropriate staff.
- 3 Maintain the drinking water protection area signs at key visibility locations.

### **Facilities Management:**

- 3 Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).

- 3 Monitor all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- 3 Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- 3 For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- 3 Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- 3 Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- 3 Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. ATTACHMENTS**

- Maps of the Public Water Supply (PWS) Protection Areas.
- Recommended Source Protection Measures Factsheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Ralph Semb DBA Weatherhead's

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
December 17, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Ralph Semb DBA Weatherhead's
<i>PWS Address</i>	French King Highway
<i>City/Town</i>	Erving, Massachusetts
<i>PWS ID Number</i>	1091010
<i>Local Contact</i>	Mr. William Barton
<i>Phone Number</i>	(800) 340-6041

<i>Source Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1091010-01G	267	687	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Weatherhead's complex is located on the Mohawk Trail, (State Route 2) in Erving approximately 1,000 feet from the Route 63 intersection. The facility served by the public water system consists of two apartment buildings with a swimming pool, one residence, a bowling alley with a snack bar, a self-serve car wash and a full service restaurant. The facility heats with propane and there is no record of fuel oil on-site although the residents may use various fuels. Wastewater is discharged to the Erving

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

municipal wastewater treatment plant. The facility is also connected to the Erving Water Department municipal water system and utilizes water to supplement in an emergency and times of high demand. The facility utilizes dry wells for storm drains in the parking areas.

The Zone I is the protected area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 267 feet and 687 feet, respectively, based on metered water use of approximately 13,000 gallons per day.

The overburden in the immediate area is mapped as a thick glacial stratified drift deposit over bedrock. The feature is a delta formed into Glacial Lake Hitchcock during the recession of the glaciers some 18,000 years ago. There is no evidence of a protective barrier of either thick till or of a confining, protective clay layer in the vicinity of the well. The bedrock in the immediate area of the well is mapped as Fourmile and Dry Hill gneiss, rock associated with the Bronson Hill Zone. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

Water from the well is not treated. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #1 includes the entire facility: apartment buildings, 6 homes, part of Routes 2 and 63, side streets, the car wash and the restaurant.

#### Key issues include:

1. **Non-conforming activities within Zone I;**
2. **Residential;**
3. **Commercial facilities; and**
4. **Transportation corridors.**

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	--	--	--	Non-conforming uses in Zone I. Contact DEP prior to expanding the system or conducting any work in Zone I.
Residential	Yes	Yes	Moderate	Provide BMPs for household hazardous materials management.
Car wash	Yes	Yes	Low	The facility is connected to the municipal sewer.
Self-storage units	No	Yes	--	Monitor for storage of hazardous materials such as petroleum.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/den/hrn/dws/](http://www.state.ma.us/den/hrn/dws/).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor/parking with dry wells	Yes	Yes	Moderate	Limit road deicing materials and monitor parking areas.
Transformers	Yes	Yes	Low	Although most transformers today do not contain PCBs, the oils may pose a threat due to the proximity to the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for Weatherhead's water system is moderate, based on the presence of several moderate threat ranked land uses or activities in the Zone I and IWPA. Please refer to Table 2 for more details.

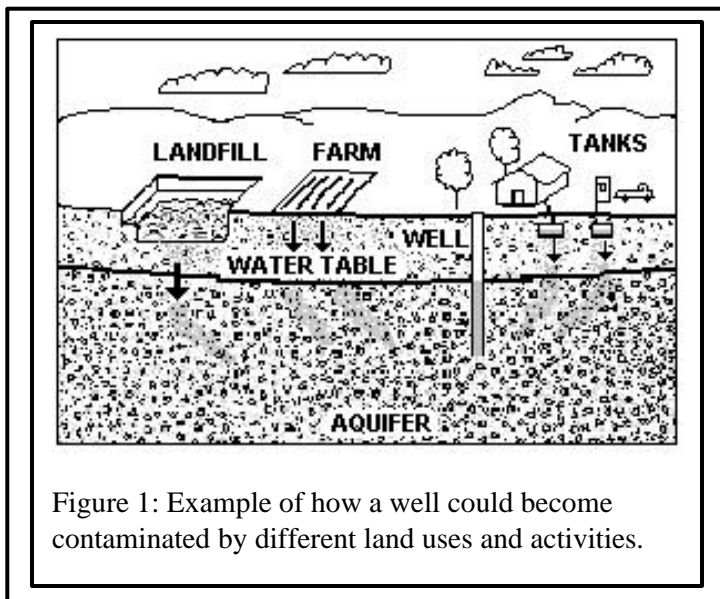
**1. Non-conforming activities within Zone I** – Currently, the water supplier does own the entire Zone I area however, the activities conducted within the Zone I are non-conforming and may pose a potential threat to the water supply. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I activities prior to increasing water use or expands the facility.

#### Recommendations:

- ✓ Consider relocation of the well if potential threats cannot be mitigated and water quality is impacted by activities or consider utilizing the Erving supply as an alternative.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- ✓ Where it is feasible, remove all hazardous materials from the Zone I. Continue current good housekeeping practices and the use of BMPs for the storage, use, and disposal of hazardous materials that are within your control.
- ✓ Monitor the parking lots for spills and accidental releases, as is feasible.
- ✓ Ensure that the local emergency response team is aware of your source and the protection areas in the event there is an accident.
- ✓ Inspect the well vault regularly to ensure it is sanitary and watertight.

**2. Residential Land Uses** – The Zone I and IWPA for Well #1 has high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Although the facility itself uses propane, other properties in the IWPA may use alternate fuels. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and the associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.



#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the MA DEP website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Commercial facilities** – There are several commercial facilities located within the Zone I and IWPA: the car wash, restaurant, bowling alley and self-storage units. The potential threats are similar to those associated with residential land use such as household hazardous materials.

#### **Recommendations:**

- ✓ Since the parking area storm drains are dry wells, limit use of deicing materials.
- ✓ Provide the businesses with recommendations for BMPs regarding monitoring use of hazardous materials and monitor parking areas for accidental releases.

- ✓ Consider controlling the type of materials stored in the facility to limit hazardous material storage, including petroleum products.

**4. Transportation corridor/parking** – Route 2, Route 63 and parking for the apartments and commercial facilities are located within the Zone I and IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wild life and pets.

#### **Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination among the emergency responders to be sure they are aware of the location of your well and protection areas.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

#### **Priority Recommendations:**

- ✓ Consider relocation of the well or utilizing Erving water if potential threats cannot be mitigated and water quality is impacted.
- ✓ Inventory activities in the IWPA and catalog any new potential threats identified.

#### **Zone I:**

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Continue to prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect road drainage in the Zone I away from the well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and local town boards.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling.

### Planning:

- ✓ Since the system is already within the Zone II protection area for the Erving water supply well, be sure the emergency responders are aware of your source.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
THE BUCK RUN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS NAME</b>	The Buck Run
<b>PWS Address</b>	7 West Main Street
<b>City/Town</b>	Erving, Massachusetts
<b>PWS ID Number</b>	1091012

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1091012-01G	100	419	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

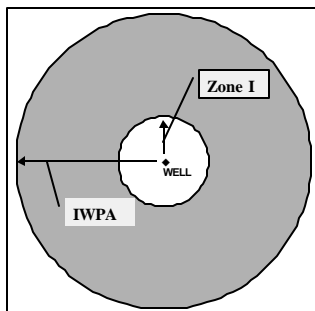
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1091012-01G)**

Zone I = 100 ft.  
IWPA = 419 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
CHARLES F ZILINSKI MEMORIAL FIELD



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Charles F Zilinski Memorial Field
<i>PWS Address</i>	Prospect Street Ext
<i>City/Town</i>	Erving, Massachusetts
<i>PWS ID Number</i>	1091014

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1091014-01G	100	411	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

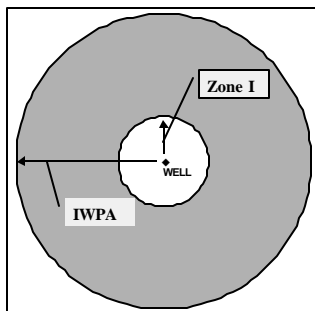
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1091014-01G)**

Zone I = 100 ft.  
IWPA = 411 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads residences and parking within the Zone I and the IWPA.

This source water assessment report is based on a site visit, water quality data and/or from other sources of information. DEP has not verified the accuracy of information submitted by you to the Department.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Gabriel Abbott Memorial School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
December 22, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Gabriel Abbott Memorial School</b>
<i>PWS Address</i>	<b>North County Road</b>
<i>City/Town</i>	<b>Florida, Massachusetts</b>
<i>PWS ID Number</i>	<b>1098004</b>
<i>Local Contact</i>	<b>Mr. William Enser</b>
<i>Phone Number</i>	<b>1-413-243-1416</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1098004-01G	100	411	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Gabriel Abbott Memorial School (the school) is located on the south side of North County Road in Florida. Florida is a small, rural, town in northwestern Massachusetts on the Vermont border. Florida does not have a municipal water system or a wastewater treatment facility. Therefore the school is served by an on-site water supply and septic disposal system. The total school student and staff population is approximately 150 people per day.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The school is served by one potable supply well (Well #1-01G), a 6-inch diameter, 150-foot deep, bedrock well that is located east of the school at the edge of the parking lot. The school, North County Road, a parking area for 12 to 15 cars, the septic system and a small play area are all within the protection areas of the well. The Town and school have undertaken steps to protect the well from potential threats during the past few years. The well was originally located in an 8-foot deep pit, but recently the well casing was extended to above grade to minimize the potential for flooding of the casing. The school also had an underground fuel oil storage tank located immediately adjacent to the well; that tank was replaced with an aboveground tank in 2000. Following the tank replacement, the Town applied for and was awarded a wellhead protection grant to move the tank topographically downgradient of the well and away from the immediate vicinity of the well. The Town is also in contact with staff from the regional Underground Injection Control Program (UIC) to address the floor drain in the basement that is believed to discharge to the septic system.

The school is located on the Hoosac Range of the Berkshire Highlands. Numerous bedrock outcrops in the area confirm the geologic mapping of thin till over bedrock. The bedrock in the immediate area of the school is mapped as the Hoosac Schist a grey-black quartz-mica schist. There is no evidence of a protective barrier of either thick till or of a confining, protective clay layer in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 100 feet and an IWPA protective radius of 411 feet. These protective radii were based on the metered water use reported by the school of approximately 500 gpd. Please refer to the attached map that shows the Zone I and IWPA.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Yes	Moderate	AST within containment in IWPA; floor drains in boiler room are being addressed.
School	Yes	Yes	Moderate	Limit road deicing materials use, use BMPs for household hazardous materials, monitor parking areas and control stormwater.
Residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel.
Septic systems components	No	Yes	Moderate	Residential and the school's wastewater components are in the IWPA.
Transportation and parking	Yes	Yes	Moderate	Monitor stormwater runoff and redirect as necessary to protect the well.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Water suppliers are required to monitor the water quality on a regular basis and the water from the school well is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Above ground storage tanks;**
3. **School facilities;**
4. **Floor drain in the boiler room;**
5. **Transportation corridors/parking; and**
6. **Residential.**

There are several activities within the Zone I and IWPA that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate based on at least one moderate threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area for the well, however, the only activities in the Zone I are passive recreation and a periodic beaver population in the nearby wetland. Systems not meeting DEP Zone I requirements for ownership or control or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides or fertilizers in Zone I.
- ✓ Do not store or use household hazardous materials near the well.
- ✓ Inspect the well regularly to ensure the cap is secure and there is no standing water near the well.

**2. Above ground fuel oil storage** – There is a fuel oil AST within containment in the IWPA. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.

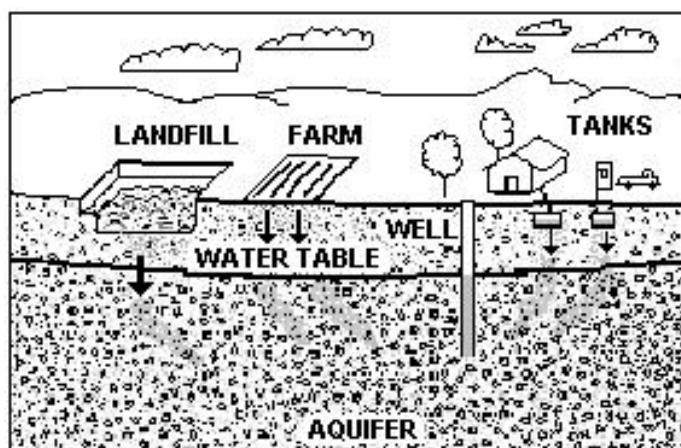


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

- V Monitor all activities associated with the fuel oil, especially delivery.
- V Have spill containment/absorbent materials available on-site

**3. School facilities** – Elementary and preschools generally use only household type hazardous materials.

#### Recommendations:

- V Continue the use of Best Management Practices for all activities at the school.
- V Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V For additional information, refer to the Massachusetts Public Health Association's Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**4. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. The school is presently working with the regional DEP UIC staff to resolve the issues regarding the floor drains.

#### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- V Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP staff for the UIC program listed above. Oil lines from the tank to the boiler are sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- V Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**5. Transportation corridor/parking** – Transportation corridors and parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

#### Recommendations:

- V Prepare an Emergency Response Plan that includes coordination among the emergency responders to be sure they are aware of the location of your well.
- V Consider prohibiting parking immediately in front of the well casing.

**6. Residential Land Use** – There are two residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the school and the Town on their efforts to remove the UST, pursue grant funds to move the AST, protect the well casing and address floor drains in the boiler room.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- ✓ Communication with the Town boards and emergency responders regarding the location of the well and the protection areas and continue efforts to protect the well.

**Zone I and IWPA:**

- ✓ Consider prohibiting parking immediately adjacent to the well.
- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Post drinking water supply signs in key locations such as along the access road and in the parking areas, but away from the well.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, cleaning products and household hazardous waste.

**Training and Education:**

- ✓ Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.

**Planning:**

- ✓ Request that local officials develop and include the IWPA in an Aquifer Protection District and to continue assisting you in protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- ✓ Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department’s Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for

funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
Whitcomb Summit Motel



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 25, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Whitcomb Summit Motel
<i>PWS Address</i>	Mohawk Trail
<i>City/Town</i>	Florida, Massachusetts
<i>PWS ID Number</i>	1098005

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I (feet)</i>	<i>Zone II</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 Spring	1098005-01G	591	Refer to the map	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and a Contribution Area or Zone II. The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The Contribution Area is the larger area that is likely to contribute water to the spring. Refer to **Figure 1** on page 2 for an example of a Zone I and Contribution Area.

The Contribution Area of Zone II is the primary recharge area for the aquifer and the spring source. This area was defined by a hydrogeologic study conducted for the MA DEP SWAP program by the USGS. The Zone II was approved by DEP. Refer to the attached map to determine the land within your Zone II.

## What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Contribution Area (Zone II). Please see the enclosed map for your well's Zone I and Zone II areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

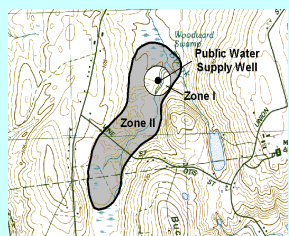
Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I IWPA  
EXAMPLE Source Protection  
Area for WELL #1 SPRING  
(1098005-01G)**

Zone I = 591 ft.  
Refer to map for the  
Contribution Area

### What is a Protection Area?

A spring's water supply protection area is the land around the spring where protection activities should be focused. Each spring has a Zone I protective area and a contribution area (Zone II).



## How Was My Well's Susceptibility Determined?

Your spring's **high** susceptibility to potential microbial threats is based on the septic system components within the contribution area and the physical construction of the spring collection box. The source is considered to be under the influence of surface water and the system is required to address this issue through specific actions as detailed by the Department. Contact the Department for further information regarding this source. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and the motel facilities within the Zone II contribution area.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Northfield Mount Hermon School**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Northfield Mount Hermon School
<i>PWS Address</i>	206 Main Street
<i>City/Town</i>	Gill
<i>PWS ID Number</i>	1106002
<i>Local Contact</i>	George Santucci
<i>Phone Number</i>	413-498-3455

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

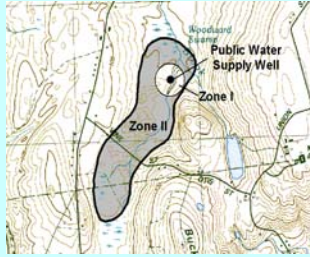
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**Zone II #:** 499

**Susceptibility:** High

Well Names	Source IDs
Tubular Wellfield	1106002-01G

The Northfield Mount Hermon School has two campuses located in the rural communities of Northfield and Gill in Western Massachusetts along the Vermont border. The tubular wellfield for Northfield Mount Hermon School is located on the northwest side of the school campus in the neighboring community of Bernardston. The wellfield consists of twelve, 2 ½-inch diameter, 24-foot deep wells in series, manifolded together. The Zone I for the wellfield and the Zone II are shown on the attached map. The Zone I is oval shape with radial distance of 250 feet on the two end wellpoints. The Zone II, recharge area was delineated as part of the SWAP program utilizing analytical modeling and hydrogeologic mapping. Bernardston had designated an area around the wellfield as a water supply protection area, however that area must be revised to reflect the recently delineated Zone II, recharge area. Please refer to the attached map to view the boundaries of the Zones I and II.

The surficial deposits in the area are a result of glacial retreat some 10,000 to 12,000 years before present and in some areas overlain with recent alluvial deposits. Well logs from exploration programs indicate coarse sand and gravel from the surface to approximately 30 feet below grade, general coarsening downward until fine silt and clay are logged from 50 to 60 feet below grade where till was encountered. Drilling refusal at bedrock was noted in the logs at approximately 70 feet below grade. The well points are 24 feet in depth and therefore are above the potentially confining clay unit. Aquifers in this type of geologic setting are considered to be highly vulnerable to contamination because there is no confining layer such as clay to create a hydrogeologic barrier that can prevent contaminant migration to the aquifer. USGS mapped the bedrock in the area as the Bernardston Formation primarily consisting of fine-grained phyllite with interbeds of thin quartzite, several feet thick. In some areas the phyllite merges with dark gray and black slate.

Chlorine is used to disinfect the well water and sodium hydroxide is added for pH adjustment prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II area for Northfield Mount Hermon School is a mixture of residential, agricultural, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include: -

1. Residential land uses
2. Hazardous waste generator
3. Transportation corridors
4. Comprehensive wellhead protection planning
5. Agricultural activities
6. Railroad Right-of-Way

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2. The water supplier owns or controls the entire Zone I and is therefore in compliance with the Department's Zone I requirements. It was noted, however, that a floor drain was present in the pump house at the wellfield. Department policy allows for a drain in the water supply pump house provided it discharges at least 100 feet from the well and no hazardous materials can enter the drain. Since the water supply chemicals are properly stored in containment, it is recommended that a berm be placed around the drain itself as a precaution to prevent any accidental release through the drain from any lubricants that may be present on the pump.

**1. Residential Land Uses** – Approximately 7% of the Zone II consists of residential areas. Since Bernardston does not have a municipal sewer, wastewater is disposed of through on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

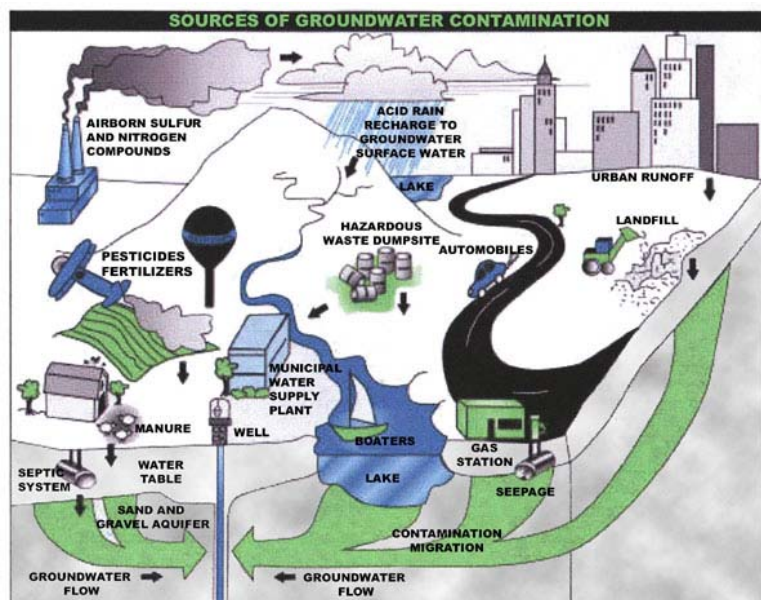
- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**2. Hazardous Materials Storage and Use** – A small engine repair shop is located near the wellfield within the Zone II, just outside the Zone I. Its close proximity to



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the source is of concern if good housekeeping and management is not practiced. The facility is registered as a Very Small Quantity Generator of Hazardous Waste. An inspection was conducted at the shop for the Underground Injection Control Program that regulates industrial floor drains. An illegal floor drain was noted during the inspection and a notice of non-compliance was issued. The Department will require the facility to come into compliance with all appropriate regulations and evaluate if a release has occurred at the facility. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store hazardous materials. If hazardous materials are improperly stored, used, or disposed of, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Monitor the progress of the evaluation at the small engine repair shop. Refer to the Department's UIC contact Tony Zaharias at 413-755-21220 for further information.
  - ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
  - ✓ Assist the local Board of Health to identify those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Assist the local Board of Health to educate local businesses on Massachusetts' floordrain requirements. See brochure "Industrial Floor Drains" for more information.

#### **Potential Source of Contamination vs. Actual Contamination**

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**3. Transportation Corridors** - Route 10 intersects the Zone II just north of the wellfield and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

#### **Source Protection Decreases Risk**

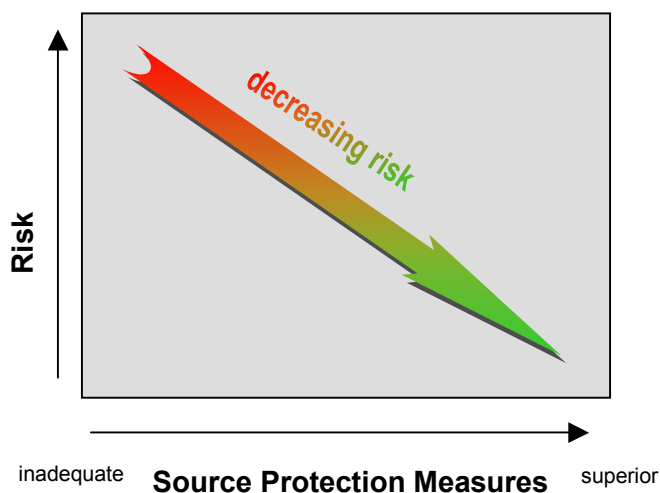


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

#### **Transportation Corridor - Recommendations:**

- ✓ **Low Salt Areas** - Join in efforts with the other water districts to submit a formal request to MA Highway Department and the Town of Bernardston in establishing Low Salt Areas within the Zone II and local roads. Encourage both organizations to educate employees and private contractors of the restrictions in designated Low Salt Areas.
- ✓ **Design and Best Management Practices** -

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Fertilizer Storage or Use	2 fields	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	2 fields	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>			
Golf Course and maintenance shop	1	M	Fertilizers or pesticides: over-application or improper handling, hazardous materials
Railroad Tracks	1	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances, etc.)	1	H	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cess-pools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling (residential)
Small quantity hazardous waste generators	2	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Encourage Massachusetts Highway Department and its contractors to design a stormwater drainage system along within the Zone II that discharge stormwater outside of the recharge areas. Be sure the local and state highway departments are aware of the boundaries of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that you are notified of any spills within the Zone II and that the spill is effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Protection Planning** – Although the Bernardston does have an area around the wellfield that is designated as a water supply protection area, the controls don't entirely cover the Zone II nor meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Protection Planning Recommendations:**

- ✓ Work with Bernardston planners and the Bernardston Water Department to develop a comprehensive Water Supply Protection Plan for the various supplies in town. Update you current plan to include the newly delineated Zone II and assist Bernardston in establishing a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to review the recommendations in the Zone II reports that compare local wellhead protection controls with current

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

MA Wellhead Protection Regulations 310 CMR 22.21(2). The Department staff is available to assist you and the community of Bernardston in developing comprehensive protection. The Planning Board should contact Catherine V. Skiba 413-755-2119 of the Springfield Office. Contact For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.



- ✓ Refer to the Zone II reports for recommendations regarding floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2). Again coordinate with other water suppliers and the Board of Health. The Board of Health should contact Catherine V. Skiba 413-755-2119 of the Springfield Office.

**5. Agricultural Activities** – Croplands and pasture lands make up 38% of the land uses in the Zone II. There are corn and hayfields in the Zone II, in close proximity to the Zone I. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.



- ✓ Require any farmers working on your property that is leased, to have a farm plan and adhere to regulations and BMPs for fertilizer and pesticide use.
- ✓ Inform farmers that they are within the Zone II. The DFA—Pesticide regulations controls the types of pesticides that may be applied in a sensitive areas.

**6. Railroad Right-Of-Way** – A railroad spur runs through the Zone II north of the wellfield serving freight trains and is a potential contaminant source due to the possibility of chemicals released during normal use, track maintenance, and accidents. Over-application or improper handling of herbicides during railroad right-of-way maintenance is a potential source of contamination. Leaks or spills of transported chemicals or train maintenance chemicals are also potential sources of contamination to the water supply.

**Railroad Right-of-Way - Recommendations:**

- ✓ **Best Management Practices** - Work with local officials during their review of the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that pesticides are not used in the Zone I.
- ✓ **Emergency Response Plan** - Work with your local fire department to review emergency response plans. Request that emergency response teams practice containment of potential contaminants from train accidents.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Land uses of concern that were mapped outside of the Zone II but nearby were the oil distribution facility, a junkyard and a cement plant. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources from daily activities and emergency response. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I and Zone II regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Update Emergency Response Plan. Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas and those that work school properties to make them aware of your water supply and to encourage the use of an NRCS farm plan and the Pesticide Bureau recommendations to protect water supplies.

#### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

#### Additional Information

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring activities in Zone I.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>PARTIAL</b>	Bernardston's "Aquifer Protection District" bylaw does not meet 310 CMR 22.21(2) requirements. The district outline must be modified to include the Zone II and updated to include additional controls. Contact the Planning Board with these requests. Refer them to this and Bernardston's Zone II reports for recommended revisions to the bylaws. Contact the Department for assistance with these efforts.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	Update the plan as appropriate and continue to follow and maintain the Wellhead Protection Plan
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Work with the Bernardston Planning Board, Board of Health and the other water supplier in town to establish committee. Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at residential, commercial and municipal uses within the Zone II.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
50167	Agway Inc.	Route 10	Bernardston	Air Handler	BM 150	Agricultural Supply
*MAV000015 231	Charles Repair Shop	Turners Falls Road	Bernardston	Generator of Hazardous Waste	Very Small Quantity Generator	Small Engine Repair

\*Massachusetts Identification Number

### Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Agway Inc.	RFD 1 Route 10	Bernardston	Agricultural Supply	1 Wall		10000	Fuel Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0001084	Route 10 (Agway)	Belchertown	

For more location information, please see the attached map. The map lists the release sites by RTN.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Gill Elementary School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 2, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Gill Elementary School
<b>PWS Address</b>	48 Boyle Road
<b>City/Town</b>	Gill, Massachusetts
<b>PWS ID Number</b>	1106004
<b>Local Contact</b>	Mr. William Barton
<b>Phone Number</b>	800-340-6041

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well No. 1	1106004-01G	112	427	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Gill Elementary School is located in the small, rural town of Gill, in western Massachusetts near the Vermont border. The school has a student and staff population of approximately 160 people. There are no municipal water or wastewater systems in Gill, therefore, the school is served by one on-site water supply well and on-site septic disposal system. The well for the school is located east of the school on the edge of the field, just in the woods. The school reports that the well is an 8-inch diameter, gravel developed well approximately 81 feet deep. The well has 5-feet of screen and 76 feet of casing. In 1989, the school raised the well casing above grade to address chronic bacteria problems associated with water inundating the casing. The original well for the school is immediately west, in front of the school. That well is not used.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The area is on the edge of the Connecticut River valley at the base of the Berkshire foothills. The surficial geology at the school itself is thin but deepens somewhat to the east into the Ashuela Brook valley. The deposits deepen to the east of the school and are mapped as glacial outwash deposits associated with Glacial Lake Hitchcock. There is no record of the materials encountered during drilling but geologic mapping indicates fine materials interbedded or overlying coarse materials. Recent alluvium covers the area near the brook. The bedrock is mapped as the Mount Toby Formation, a sedimentary conglomerate rock. There is no empirical evidence of a protective clay layer or thick till to prevent activities on the ground surface from threatening the water supply. Therefore, the aquifer is identified as having a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The Zone I is the area immediately around the well that is most vulnerable. The Zone I for a well is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the system require DEP approval and compliance with Zone I restrictions. Well #1 has a Zone I radius of 112 feet and an IWPA radius of 427 feet. The Zone I was based on the maximum daily water use as determined from metered water data reported on a monthly basis.

The protection areas for the school include very few activities that pose a risk of contamination. However, there are activities that are just outside of the protection areas that may pose a significant threat to the well if not managed. There is an active cornfield within the IWPA. The farmer maintains a 150-foot buffer area along the edge of the field closest to the well where he does not apply herbicides. The septic system, the school and the underground storage tank for the fuel oil are located immediately outside of the IWPA. If funding becomes available, the school may wish to consider delineating the Zone II recharge area for the well so that the protection strategy for the well can be more focused.

The well serving the school has no treatment at this time. The DEP requires public water

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to expanding the system or conducting any work in the Zone I.
Fuel oil underground storage/floor drain in boiler room	-	-	Moderate /High	Spills, leaks, or improper handling of fuel oil from school discharged through floor drain
Floor drains in boiler room	No	Yes	Moderate	Potential release of oil to the ground in the IWPA.
Septic Systems	-	-	-	Nitrates, microbial contaminants, and improper disposal of hazardous chemicals
School – lawn care	No	Yes	Moderate	Continue policy of not using pesticides and fertilizers
Pesticide and fertilizer use	No	Yes	High	Pesticide and fertilizer: improper handling/application

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Floor drain in the boiler room**
3. **Elementary School;**
4. **Fuel oil storage; and**
5. **Agricultural use.**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which require the system to own or control the entire Zone I area and allow only water supply related or other non-threatening activities in Zone I. The school's Zone I contains only passive recreation (ball field) and a wooded wetland. However, the school does not own and/or control all land encompassed by the Zone 1. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not allow any non-water supply activities in the Zone I.
- ✓ Locate the floor drain discharge location.

**2. Floor Drains in Boiler Room** – There is a sump pump and floor drain in the boiler room. The discharge point could not be exactly located during the assessment but it was believed to be to a surface discharge east of the school in the wooded area. It could not be determined if the discharge was in the Zone I or the IWPA. Title 5 prohibits disposal

of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. Contact the UIC coordinator to discuss compliance. If an accidental release occurred through the floor drain it may pose a threat to the well. It may be necessary to have the floor drain and sump pump to prevent groundwater from flooding the basement and it may be unreasonable to have the drain discharge to a tight tank. However, the floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
- ♦ Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).

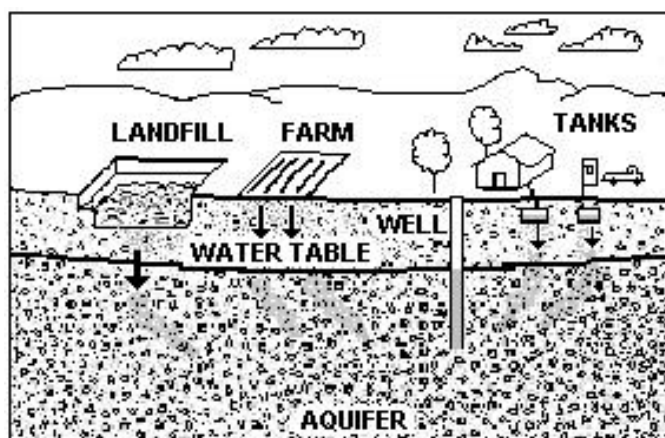


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Containment of the fuel system to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler may be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**3. School facilities and athletic fields** - Middle schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". None of the school's facilities are located within the Zone I or IWPA of the wells. However, the facilities are just outside of the protection areas.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic field. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**4. Fuel Oil Storage – Underground Storage Tank (UST)** – Although the UST fuel oil tank is outside of the protection areas, the UST can pose a potential threat to the water supply. If managed improperly, underground storage tanks and the associated fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store.

#### Recommendations:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ Monitor deliveries of oil as many spills are related to delivery.

**5. Agricultural Activities** – There is agricultural activity in an adjacent field within the IWPA of the well. The field is used to grow corn for a dairy farm and pesticides are applied by a licensed applicator. The licensed applicator is responsible for complying with regulations regarding application of products within the IWPA of the school well.

#### Recommendations:

- ✓ Attempt to obtain an agreement from the farm owner/operator that they will:
  - Follow all applicable UMASS recommendations on Integrated Pest Management.
  - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
  - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practice*.

- ✓ Continue working with the commercial farmer in your protection area. Encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. If they are not currently working with NRCS and DAR, suggest that they review the fact sheet available online and call the local office of the NRCS in Hadley at 413-585-1000 for assistance or online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Continue your current work with farmers, to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP), may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The school is commended for replacing the old well with one that is fairly remote from the school and for not using pesticides and fertilizers on its athletic fields. The water supplier should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Monitor fuel oil delivery and boiler room floor drains.

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Post the Zone I area with "Public Drinking Water Supply Recharge Area" signs at appropriate locations away from the actual well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated or if water quality is impacted by activities.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the actual well.
- ✓ Incorporate groundwater education into the school curriculum.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

#### Facilities Management:

- ✓ If it is feasible in the future, consider upgrading the heating system to propane for the purpose of removing fuel oil storage from the school.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
ALAN'S BAR B QUE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 6, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Alan's Bar B Que
<i>PWS Address</i>	235 French King Highway
<i>City/Town</i>	Gill, Massachusetts
<i>PWS ID Number</i>	1106007

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1106007-01G	163	458	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

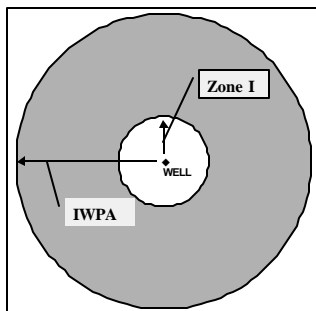
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1106007-01G)**

Zone I = 163 ft.  
IWPA = 458 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data, sanitary survey and from other sources of information provided to the Department by the owner. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- 3 inspect the Zone I and IWPA regularly;
- 3 work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- 3 restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- 3 make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- 3 remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- 3 do not use pesticides, fertilizers or road salt within the Zone I;
- 3 address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- 3 water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
DEM DAR STATE FOREST



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 18, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	DEM DAR State Forest
<i>PWS Address</i>	Moore Hill Rd
<i>City/Town</i>	Goshen, Massachusetts
<i>PWS ID Number</i>	1108010

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non- Microbial Susceptibility* *</i>
Camp-ground Well	1108010-02G	198	500	High	Moderate
Day Use Well	1108010-03G	100	422	High	High

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

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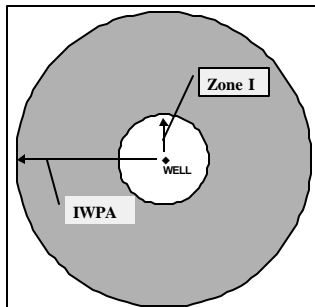
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The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for  
TWINNING BROOK  
WELL (1108010-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and the IWPA and the high ranking for the Day Use well (03G) is based on fuel oil storage in the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

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- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Bachelor Knolls

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 24, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Bachelor Knolls</b>
<i>PWS Address</i>	<b>P.O. Box</b>
<i>City/Town</i>	<b>Granby, Massachusetts</b>
<i>PWS ID Number</i>	<b>1111000</b>
<i>Local Contact</i>	<b>Mr. Edward Powers</b>
<i>Phone Number</i>	<b>413-467-9039</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111003-01G	279	746	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Bachelor Knolls water system is a residential subdivision located off of Bachelor Street in the north central part of Granby. The subdivision consists of 31 single-family residential homes served by on-site septic systems and a single public water supply well. Granby does not have a municipal water supply or municipal sewer. The neighborhood is served by a single well, Well #1 (01G) that pumps to the storage tank.

The Zone I and Interim Wellhead Protection Area radii for Well #1 are 279 feet and 746 feet, respectively. The protective radii were based on metered usage for the two highest months on record for the well. Please refer to the attached map that shows the Zone I and IWPA radii. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 is an 8-inch diameter well reportedly drilled to a depth of 130 feet. Well #1 is located in a small block building and utilizes a vertical turbine pump to fill the adjacent storage tanks. The subdivision is located in an area mapped as a potentially medium yield overburden (gravel) aquifer; there is no confining (clay) unit mapped in this area. The bedrock is mapped as sedimentary rocks of the Jurassic Period. There is no record of well construction, materials encountered during drilling, or of whether the well withdraws water from the gravel or the bedrock aquifer. There is no record of a significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the gravel or the bedrock aquifer. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface.

The Bachelor Knolls well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

A number of land uses and activities within the drinking water supply protection areas are potential sources of contamination. Therefore, the overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Tables 2 and 3.

### Key Land Use Issues include:

1. **Non-conforming activities in the Zone I**
2. **Residential homes**
3. **Septic systems**

**1. Non-conforming activities in the Zone Is** – The Zone I for Well #1 is non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in the Zone I. The Zone I for Well #1 contains all activities associated with a residential neighborhood: roadways, transformers and residential homes. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

### Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.

**Table 2: Table of Activities Common to the Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Roadways	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Transformers	Yes	Yes	Moderate	Potential release of MODF; contact utility to inform them you are a PWS
Septic system components	Yes	Yes	Moderate	Several residential systems in Zone I; multiple in IWPA
Residential homes, lawns and swimming pools	Yes	Yes	Moderate	Household hazardous materials, pesticides and herbicides

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



- ✓ Prepare an emergency response plan for responding to an accidental release of hazardous materials such as home heating fuel or gasoline.
- ✓ Monitor the Zone I and IWPA for spills and leaks of materials such as household hazardous materials and petroleum products.

**2. Residential homes** – Residential development includes the subdivision and abutting residential neighborhoods. Normal residential activities pose minimal threat to the water quality of the public water supply as well as their own private supply, provided homeowners are aware of the potential hazards of household waste (including automotive maintenance), lawn care chemicals, pool chemicals, animal waste and septic systems and they utilize best management practices.

**Recommendations:**

- ✓ Provide residents with information about protecting the facility's resources. Include information on Best Management Practices (BMPs) for the use of pesticides, household hazardous waste and septic system maintenance and disposal practices.
- ✓ Encourage residents to participate in household hazardous waste collection days and the paint exchange program in Granby.

**3. Septic Systems** - Granby does not have municipal sewers in this area, therefore all homes are served by on-site septic disposal. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

**Recommendations:**

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

Work with the DEP and local officials regarding protecting the water supplies through emergency response coordination, especially with respect to spills and accidental releases that may be discharged through storm drains.

### 3. Protection Recommendations

To reduce the system's susceptibility to contamination, the Bachelor Knolls water supplier should review and adopt the following recommendations:

**Priority Recommendation:**

- ✓ Provide residents with information about protecting the neighborhood's resources. Include information on Best Management Practices (BMPs) for the use of pesticides, household hazardous waste and septic system maintenance and disposal practices. Keep up to date on the Hazardous Waste Pickup dates in Granby and the schedules for the paint exchange shed and inform residents. Refer to the following website for guidance <http://www.state.ma.us/dep/consumer/consumer.htm>

**Zone I and IWPA:**

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Continue the practice of prohibiting public access to the well by locking facilities, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any aboveground tanks for leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities if Zone I threats cannot be mitigated.
- ✓ Work with the DEP and local officials regarding protecting the water supplies through emergency response coordination.

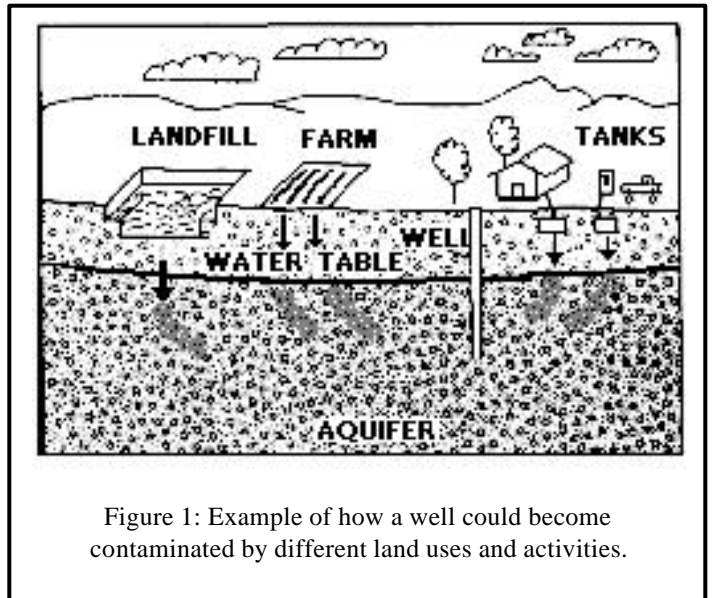


Figure 1: Example of how a well could become contaminated by different land uses and activities.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:

[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws)

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents. Ask that your facility be included in Town wide water supply protection efforts.

## Training and Education:

- ✓ Train the water supply personnel on proper emergency response and best management practices so that you may assist the residents in protecting their water supply.
- ✓ Maintain the drinking water protection area signs at key visibility locations along the roadway.

## Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Continue the practice of not utilizing fertilizers or pesticides near the supply.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. Especially the transformers in Zone I. If PCBs are present, inform the utility that you are a PWS and urge the immediate replacement of the MODF. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

## Planning:

- ✓ Work with local officials in town to include the facility IWPA in an Aquifer Protection District Bylaws and to assist you in improving protection. Prepare a wellhead protection plan.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Developing a Local Wellhead Protection Plan
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet

## Additional References:

More information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws):

- o Water Supply Protection Guidance Materials such as model regulations, BMP information, and general water supply protection information.
- o MA DEP SWAP Strategy
- o Land Use Pollution Potential Matrix
- o Draft Land/Associated Contaminants Matrix

Y:/swapqrt/Skiba/1111000



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for St. Hyacinth College

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 28, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	St. Hyacinth College
<i>PWS Address</i>	East State Street
<i>City/Town</i>	Granby, Massachusetts
<i>PWS ID Number</i>	1111001
<i>Local Contact</i>	Mr. John Krzeminski, Jr.
<i>Phone Number</i>	413-592-0527

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111001-01G	246	609	High
Well #2	1111001-02G	246	609	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

St. Hyacinth College (the school) is located in the central section of Granby on School Street (State Route 202). The facility consists of several buildings located adjacent to each other. The total school student and staff population has fluctuated during the past few years as the use of the facility has changed. Presently, the facility is the temporary home of Holyoke Catholic High School and has a current population of approximately 500 people per day. The school is served by two potable supply wells: Well #1 and Well #2. The school utilizes Well #1 as the main source and Well #2 is utilized as an active backup source. Well #1 is a 350-foot deep bedrock well; Well #2 is a 40-foot

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

deep (shallow), gravel well. Well #1 is located in a vault near the main complex in front of the gymnasium and laundry. Well #2 is located in a pit in an old hay field; there is evidence of high water on the sidewalls of the pit at a level above the top of the well casing. There is no municipal wastewater sewer system in Granby; therefore, the school and surrounding facilities are served by on-site septic disposal.

Geologic mapping in the area indicates overburden deposits of approximately 50 feet in the vicinity of Well #2 and greater than 50 feet with some amount of till over bedrock in the vicinity of Well #1. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The sediments are likely sand and gravel deposited during the recession of the glaciers some 14,000 to 18,000 years ago. The bedrock in the area is mapped as intrusive rocks of the Belchertown Complex.

The Zone I is the area immediately around the well where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. Both wells have Zone I protective radii of 246 feet and an IWPA protective radii of 609 feet. These protective radii were calculated based on the metered water use from the two highest months of use from Well #1. Please refer to the attached map that shows the Zone I and IWPA. The Zone I area for Well #1 is not conforming to current DEP requirements. The Zone I area for Well #1 includes the school, parking areas, the maintenance garage, former locations of USTs, the current fuel oil tank vault and components of septic systems; the IWPA of Well #1 includes the remainder of the school facilities, parking and the main leachfield. According to the current owners, the maintenance equipment has been removed from the garage. The Zone I for Well #2 includes only an abandoned hay field; the IWPA of Well #2 includes

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Well #1	Moderate	Contained within a vault
Floor Drains in Boiler Rooms	No	Well #1	Moderate	Consult with UIC program regarding compliance
Agriculture/Athletic fields	No	Both	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields; use IPM.
School facilities, parking and infiltration catchbasins	Well #1	Both	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential housing	No	Well #2	Moderate	Septic systems, household hazardous materials, home heating fuel
Transportation Corridor	No	Well #2	Moderate	Route 202
Septic systems components	No	Both	Moderate	Residential and part of the school leachfield are in the IWPA
Hazardous materials	No	Well #1	High	Maintenance hazardous materials/laboratory waste
Transformers	No	Both	Low	Monitor transformers for potential leaks
Confirmed hazardous materials release site	Well #1	Well #1	-	Contact Bureau of Waste Site Cleanup

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

part of Route 202 and the leachfield. All of the underground petroleum storage tanks have been removed however, the school is a confirmed hazardous materials release site as a result of a leak from a gasoline UST that was removed some time ago; remediation at the site is on-going. In addition, the school is a registered very small quantity generator of hazardous waste.

Many water supplies were developed prior to the current DEP Zone I restrictions and are therefore, grandfathered sources. Water suppliers with non-conforming sources must notify the DEP prior to conducting any additional activities within the Zone I or expanding the systems. Water suppliers are required to frequently monitor the quality of water distributed. The water utilized at St. Hyacinth College is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Fuel oil storage;**
3. **Confirmed Hazardous Materials Release Site;**
4. **Floor drains in boiler rooms;**
5. **School facilities and athletic fields;**
6. **Transportation corridors and parking; and**
7. **Hazardous materials.**

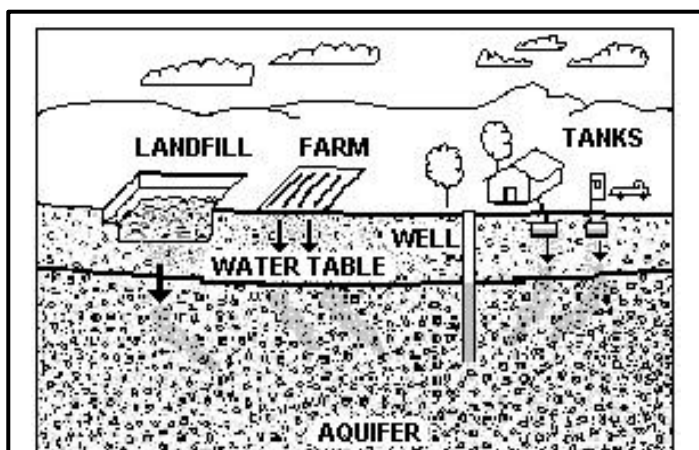


Figure 1: Example of how a well could become contaminated by different land uses and activities.

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – Although the water supplier owns and controls the entire Zone I area for both wells, there are non-conforming activities within the Zone I of Well #1. Many water supplies were developed prior to the promulgation of the current DEP Zone I requirements and those sources are grandfathered sources. Sources not meeting DEP Zone I requirements must receive approval from DEP and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

chemicals and vehicles used to access the area.

- ✓ Monitor all deliveries, especially petroleum products and hazardous materials and parking areas.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider replacement of the source if water quality becomes impacted by activities

**2. Fuel oil storage** – There is one fuel oil tank in a vault located within the IWPA. If managed improperly, tanks and associated fuellines can be a potential source of contamination due to leaks or spills of the materials they store.

#### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site.

**3. Confirmed Hazardous Waste Release Site** – The school is designated as a confirmed hazardous materials release site related to the removal of a gasoline tank years ago. As noted, remediation at the site is on-going.

#### Recommendations:

- ✓ Contact the Bureau of Waste Site Cleanup (413) 784-1100, regarding information about the status of this site. The site identification number is RTN # 1-0014117.

**4. Floor Drains in Boiler Room and garage** – There are floor drains in the boiler room, and there was a pit in the garage. The pit in the garage has been filled in and will be sealed; the drains in the boiler room discharge to a wet well from which water can be pumped into the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. The facility has contacted their consultant to address this issue. The consultant has already contacted the UIC program coordinator to discuss the alternatives.

#### Recommendations:

- ✓ Continue persuing compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Consider installing a tight tank.
- ✓ Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**5. School facilities and athletic fields** – Schools generally use only household type hazardous materials. However, high school laboratory and photo labs can use potentially harmful materials and the school does not have a tight tank for the laboratory waste. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers and/or pesticides. Storm drains in the parking areas at the school drain directly into the ground.

#### Recommendations:



- V Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- V Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- V Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- V Review the handling of laboratory wastes to determine if a tight tank is appropriate.
- V Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V Refer to the Massachusetts Public Health Associations Healthy Schools website available online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.
- V Review laboratory wastes and determine if a tight tank or other management process is required. Laboratory, photo and other non-sanitary wastewater should not be disposed of through a septic system. Refer questions to Paul Nietupski at 413-755-2218 of the Springfield Office of the DEP regarding wastewater issues.

**6. Transportation corridor** – Route 202 is located within the IWPA along with the access and parking areas for the facility. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance, car washing, and accidental spills, as well as waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- V Monitor the sodium levels in the water.

**7. Hazardous Materials Storage and Use** – The school utilizes hazardous materials for maintenance. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. The school is a registered very small quantity hazardous waste generator.

**Hazardous Materials Storage and Use Recommendations:**

- V Review current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the water supply's susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I. The school should comment to the various town boards regarding developments that may impact the school's wells.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- V Replace the wells if the sources cannot be adequately protected or if water quality is impacted.

**Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Monitor activities and if there is evidence of increased activity or access, consider relocating the wells.
- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the wells themselves.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals,



lawn care chemicals and fertilizers.

- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

#### **Facilities Management and Education:**

- V Incorporate groundwater education into school curriculum (7-12 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and certified operator.
- V Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room and waste disposal.

#### **Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the IWPA's and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	St. Hyacinth College	School Street	Granby	Hazardous Waste Generator (Waste oil)	VSQG	Maintenance
				Air Quality	AQ	Plant

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0014117	School Street	Granby	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Granby Housing Authority

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 21, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Granby Housing Authority</b>
<i>PWS Address</i>	<b>West State Street</b>
<i>City/Town</i>	<b>Granby, Massachusetts</b>
<i>PWS ID Number</i>	<b>1111002</b>
<i>Local Contact</i>	<b>Mr. John Sullivan</b>
<i>Phone Number</i>	<b>413-467-9300</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111002-01G	246	609	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Granby Housing Authority is comprised of 4 buildings each with 14, 1-bedroom apartment units and an administration building. The facility is located in the central section of Granby on Phins Hill Road. The total population is approximately 60 people. The facility is served by a single potable supply well, Well #1 and wastewater from the facility is discharged to a municipal sewer connected to South Hadley.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Well #1 is a 280-foot deep bedrock well. The well is located in a vault behind the facility. Geologic mapping in the area indicates thin overburden deposits with the bedrock in the area mapped as Jurassic aged sedimentary rocks of the Portland Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The Zone I and IWPA protective radii are 209 feet and 519 feet. These protective radii were calculated based on the metered water use from the two highest months of use from Well #1. Please refer to the attached map that shows the Zone I and IWPA. The Zone I area for Well #1 is not conforming to current DEP requirements. The Zone I area for Well #1 includes one of the buildings, parking areas, and the maintenance garage. The IWPA includes the remainder of the facility, parking, West State Street and a farm supply store southeast of Route 202. The maintenance garage has a floor drain that is believed to have an oil-water separator and to be connected to the sewer. Lawn and maintenance equipment is stored in the facility including paints, thinners and petroleum products.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Lawn	Yes	Yes	Low	Continue prohibiting the use of pesticides/fertilizers on lawns at the facility.
High density residential housing	Yes	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel
Transportation Corridor/parking	Yes	Yes	Moderate	Route 202 and internal road and parking
Hazardous materials – Fertilizers & pesticides at the store	No	Yes	Moderate/High	Maintenance of hazardous materials – store materials in containment. Farm store partially within IWPA.
Transformers	No	Yes	Low	Monitor transformers for potential leaks

**-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential facilities;**
3. **Transportation corridors and parking; and**
4. **Hazardous materials.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate based on at least one moderate threat activity within the protection areas. Please refer to Table 2. Although the farm store does have pesticides and fertilizers, they are stored for sale and not application on site.

**1. Non-conforming Zone I** – Although the water supplier owns and controls the entire Zone I area, there are non-conforming activities within the Zone I. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all deliveries, especially petroleum products and hazardous materials and parking areas.
- ✓ Continue to prohibit the use of pesticides, fertilizers or road salt within Zone I.

**2. Residential Land Uses** – The residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - Although Granby Housing Authority heats by electricity, the other private residences within the northern portion of the IWPA may heat with fuel oil or diesel fuel. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and

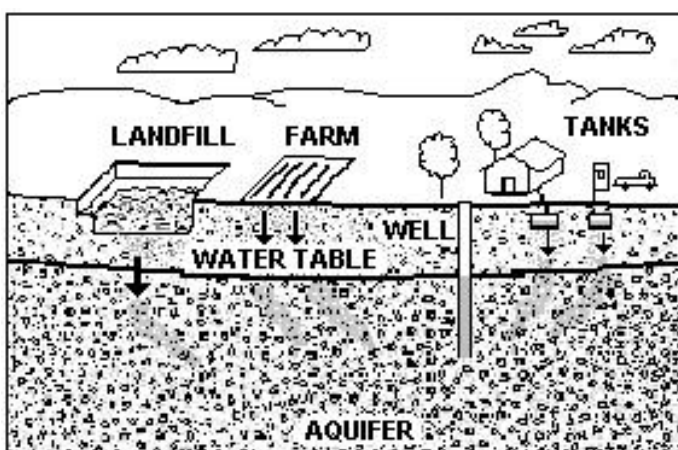


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation corridor and parking** – Route 202 is located within the IWPA along with the access and parking areas for the facility. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- ✓ Monitor the sodium levels in the water.

**4. Hazardous Materials Storage and Use** – The facility utilizes hazardous materials for maintenance. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, or floor drain leading directly to the ground.

### Hazardous Materials Storage and Use Recommendations:

- ✓ Review current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- ✓ Use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I.

Please review and adopt the key recommendations listed above and as follows:

### Priority Recommendations:

- ✓ Consider modifying the access to the pit for safer access.

### Zone I and IWPA:

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider relocating the wells.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

**Training and Facilities Management:**

- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, groundskeepers, and certified operator.

**Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the well's IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet



# Source Water Assessment Program (SWAP) Report for Granby Heights Condominium

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 24, 2001

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	<b>Granby Heights Condominium</b>
<i>PWS Address</i>	<b>State Route 116</b>
<i>City/Town</i>	<b>Granby, Massachusetts</b>
<i>PWS ID Number</i>	<b>1111003</b>
<i>Local Contact</i>	<b>Mr. John C. Young</b>
<i>Phone Number</i>	<b>413-785-5312 ext. 102</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111003-01G	221	543	Moderate
Well #2	1111003-02G	221	543	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Granby Heights Condominium complex is located south of Route 116 and consists of two buildings with a total of 76 units that are heated by electric heat. Currently, approximately 135 people reside at the complex. The facilities include a tennis court, a swimming pool, parking, lawn and wooded areas. The facility is served by onsite septic disposal. Granby does not have a municipal water supply, however, South Hadley's water system extends to within one-quarter mile of the facility. The complex is served by two wells, Wells #1 (01G) and #2 (02G) that pump simultaneously to the storage tank.

The Zone I and Interim Wellhead Protection Area radii for Wells #1 and #2 are 221 feet and 543 feet, respectively. The protective radii were based on metered usage for the two highest months on record for the wells. Please refer to the attached map that shows the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I and IWPA radii. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller.

Well #1 is a 6-inch diameter well drilled into the bedrock aquifer. Well #1 is located in a concrete pit in the parking area and is nearly flush with the floor of the pit. The pit has a watertight manhole access port and is approximately six feet deep. There is no drain in the pit. Although there was moisture approximately 18-inches up on the wall of the pit, there was no obvious evidence of flooding in the pit. Well #2 is located adjacent to the swimming pool and extends approximately 12-inches above grade. At the time of the assessment, the cover of Well #2 was not secure and the slope on the hillside was slumping allowing for ponding of water around the wellhead.

The complex is located on an upland area believed to be underlain by till and shallow bedrock. The bedrock is mapped as Mesozoic sedimentary and volcanic units consisting of conglomerate, sandstone and basalt. There are no detailed records of the well construction or of the materials encountered during drilling. However, records do indicate Well #1 is approximately 300 feet deep and Well #2 is approximately 290 feet deep. Pumps in both wells are set at 260 feet. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Granby Heights Condominium well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

A number of land uses and activities within the drinking water supply protection areas are potential sources of contamination. Therefore, the overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of moderate threat land use or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

**Table 2: Table of Activities Common to the Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lots and driveways	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Transformers (above and below grade)	Both Wells	Both Wells	Moderate	Potential release of MODF
Septic system components	Both Wells	Both Wells	Moderate	Lines and tank in Zone I, leachfield in IWPA
Pool and related chemical storage and backwash discharge	Well #1	Well #2	Moderate	Use Best Management Practices, containment

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Table 2: Table of Activities Common to the Protection Areas (Continued)**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential homes, lawns and parking	Well #1	Both Wells	Moderate	Household hazardous materials, pesticides and herbicides
Storm drains	Both Wells	Both Wells	Low	Road salt, spills and runoff

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Key Land Use Issues for the Wells include:**

1. Non-conforming activities in the Zone I
2. Wellhead sanitary seal
3. Residential homes

**1. Non-conforming activities in the Zone Is** – The Zone I for both Wells #1 and #2 are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone I for Wells #1 and #2 contain all activities associated with the facility: parking, roadways, transformers and residential buildings. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendations:**

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Encourage residents to utilize Granby's household hazardous waste collection days.
- ✓ Monitor parking lots for spills and leaks.

**2. Wellhead integrity** – There is a watertight manhole cover for Well #1 and there is no apparent sanitary seal on Well #2.

**Recommendations:**

- ✓ Inspect the integrity of the watertight manhole gasket at least four times per year. Be diligent in setting the gasket properly.
- ✓ Install watertight seals on all wellhead connections in Well #1. Continue the current practice of monitoring the vault periodically to be sure that groundwater does not enter the vault.
- ✓ Install a sanitary seal on Well #2.

**3. Residential homes** – Residential development includes the condominium complex and an abutting residential neighborhood. Normal residential activities pose minimal threat to the water quality of the public water supply as well as their own private supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and septic systems and they utilize best management practices.

**Recommendations:**

- ✓ Provide residents with information about protecting the facilities resources. Include information on Best Management Practices (BMPs) for the use of pesticides, household hazardous waste and septic system maintenance and disposal practices.
- ✓ Encourage residents to utilize Granby's household hazardous waste collection days and paint exchange program.

Other activities identified in the protection areas are stormwater discharges located within the Zone I and IWPA of the wells. The condominium should use BMPs and include periodic cleaning of catch basins and street sweeping. Street sweepings and catch basin cleanings are considered solid waste and should be handled as described in the DEP's policy.

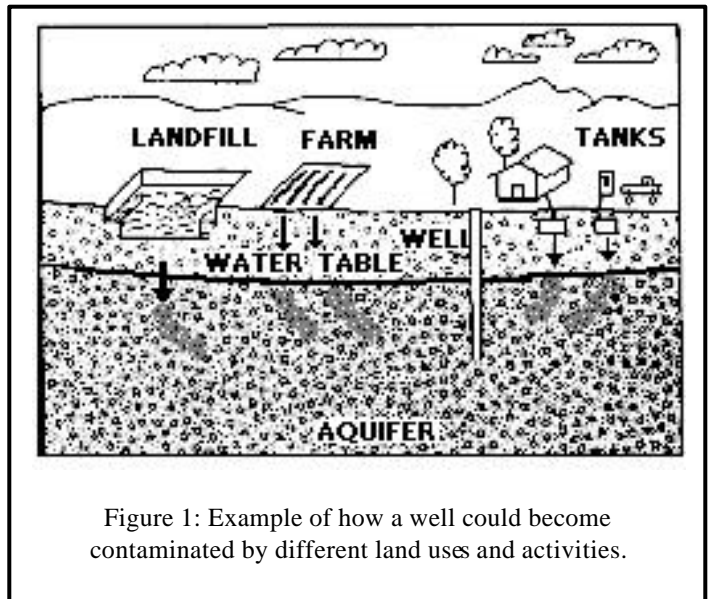


Figure 1: Example of how a well could become contaminated by different land uses and activities.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Work with the DEP, State highway and local officials regarding protecting the water supplies through emergency response coordination, especially with respect to spills and accidental releases that may be discharged through storm drains.

## 3. Protection Recommendations

To reduce the system's susceptibility to contamination, the Granby Heights Condominium should review and adopt the following recommendations:

### Zone I and IWPA:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the wells by locking facilities and posting signs at the facility entrance. Check the integrity of the well caps regularly and replace as necessary.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any aboveground tanks for leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Work with the local fire department, DEP, State highway, and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents. Ask that your facility be included in Town wide water supply protection efforts.

### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, certified operator, and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any hazardous materials at the facility. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Continue utilizing Best Management Practices (BMPs) for the use of fertilizers pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. Especially the transformers in Zone I. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in an Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate



### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at

[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws)

including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet

Y:SWAPQRT/SKIBA/1111003



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Granby Jr./Sr. High & East Meadow School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 16, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Granby Jr./Sr. High &amp; East Meadow School</b>
<i>PWS Address</i>	<b>East State Street</b>
<i>City/Town</i>	<b>Granby, Massachusetts</b>
<i>PWS ID Number</i>	<b>1111006</b>
<i>Local Contact</i>	<b>Mr. Kenneth Scully</b>
<i>Phone Number</i>	<b>413-467-3181</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111006-01G	232	569	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Granby Jr/Sr High & East Meadow School (the school) is located in the central section of Granby on East State Street (State Route 202). The facility consists of two separate school building located adjacent to each other. The total school student and staff population is approximately 800 people per day. The school is served by one potable supply well (Well #1). The school also maintains a second emergency well (Well #2). Well #2 is a shallow, gravel well that is disconnected from the system and will not be further addressed in this report. Well #1 is located in the front lawn of the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

school approximately 150 feet from the road and 300 feet from the school. The well is an 8-inch diameter, 24-foot deep, gravel developed well. There is no municipal wastewater sewer system in Granby; therefore, the school and surrounding facilities are served by on-site septic disposal.

Geologic mapping in the area indicates overburden deposits of greater than 50 feet of sand with some amount of till over bedrock at the school. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 14,000 to 18,000 years ago. The bedrock in the area is mapped as gneiss of the Belchertown Complex.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 232 feet and an IWPA protective radius of 569 feet. These protective radii were calculated based on the metered water use from the two highest months of use. Please refer to the attached map that shows the Zone I and IWPA. The Zone I area for the well is not conforming to current DEP requirements. The Zone I area for Well #1 includes part of the school parking area and a small portion of Route 202. The IWPA includes both schools, parking, fuel oil tanks, residential homes, a portion of a cornfield and components of septic systems.

The well is a relatively shallow well and there is no evidence of a continuous, protective confining clay layer in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Yes	High	UST w/leak detection at school
Floor Drains in Boiler Rooms	No	Yes	Moderate	Consult with UIC program regarding compliance
Agriculture/Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields. Refer farmers to DAR and NRCS regarding IPM
School facilities, parking and infiltration catchbasins	Yes (6 spaces)	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel
Transportation Corridor	Yes	Yes	Moderate	Route 202
Septic systems components	No	Yes	Moderate	Residential and part of the school leachfield are in the IWPA
Hazardous materials	No	Yes	High	Maintenance hazardous materials/laboratory waste
Transformers	No	Both	Low	Monitor transformers for potential leaks

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The pH of the water is adjusted for corrosion control prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tanks;**
3. **Floor drains in boiler rooms;**
4. **School facilities and athletic fields;**
5. **Transportation corridors and parking; and**
6. **Hazardous materials.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area for either well. Systems not meeting DEP Zone I requirements for ownership or control, or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all fuel oil deliveries and parking areas.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Underground fuel oil storage** – There are three fuel oil USTs located within the IWPA. If managed improperly, fuel oil tanks can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site

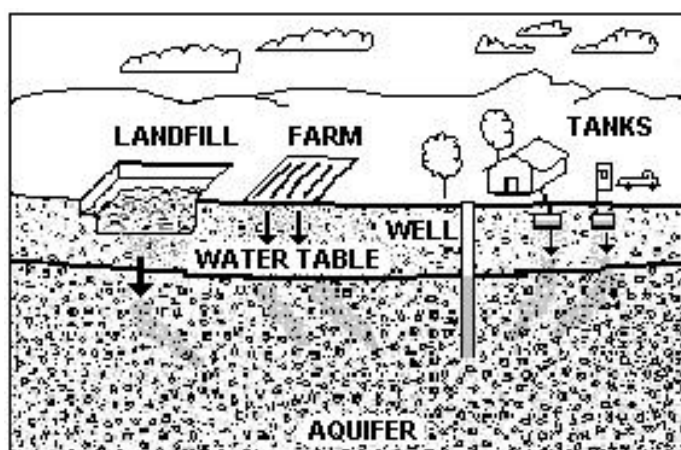


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

**3. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

#### Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**4. School facilities and athletic fields** – Elementary and middle schools generally use only household type hazardous materials. However, high school laboratory and photo labs can use potentially harmful materials and the school does not have a tight tank for the laboratory waste. There are state and federal regulations controlling some of the activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers, pesticides, all of which can be of concern. Storm drains in the parking areas at the school drain directly into the ground. The high school does use micro-pipeting techniques to minimize laboratory waste.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review the handling of laboratory wastes to determine if a tight tank is appropriate.
- ✓ Review your emergency response plan regarding to accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**5. Residential Land Use** – There are two residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.



- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**6. Transportation corridor** – Route 202 is located within the Zone I and IWPA along with the access and parking areas for the facility. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.
- V Monitor the sodium levels in the water. MA Highway Department has designated the area as reduced salt use area.

**7. Hazardous Materials Storage and Use** – The school utilizes hazardous materials for maintenance. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I. The school district should comment to the various town boards regarding developments that may impact the school’s wells.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- V Communication with the Town boards regarding the location of the wells and the protection areas.

**Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Monitor activities and if there is evidence of increased activity or access, consider relocating the well.



- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

#### **Training and Education:**

- V Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and certified operator.

#### **Facilities Management:**

- V Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.
- V Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room and waste disposal.

#### **Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain
- Very Small Quantity Generator (VSQG) information



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for West Street Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 16, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	West Street Elementary School
<i>PWS Address</i>	West Street
<i>City/Town</i>	Granby, Massachusetts
<i>PWS ID Number</i>	1111014
<i>Local Contact</i>	Mr. Kenneth Scully
<i>Phone Number</i>	413-467-3181

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111014-01G	143	443	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Granby West Street Elementary School (the school) is located near the center of Town on West Street. The total school student and staff population is approximately 350 people per day. The school is served by one potable supply well (Well #1) which is located immediately behind the building and is a 6-inch diameter, 125-foot deep, bedrock well. There is no municipal wastewater sewer system in Granby; therefore, the school and surrounding facilities are served by on-site septic disposal.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Geologic mapping in the area indicates overburden deposits of less than 50 feet of sand with some amount of till over bedrock at the school. The surficial deposits in the area are sand and gravel that was likely deposited during the recession of the glaciers some 14,000 to 18,000 years ago. The bedrock in the area is mapped as gneiss of the Belchertown Complex.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 193 feet and an IWPA protective radius of 492 feet. These protective radii were calculated based on the metered water use from the two highest months of use. Please refer to the attached map that shows the Zone I and IWPA. The Zone I area for the well is not conforming to current DEP requirements. The Zone I area for Well #1 includes part of the school and some parking. The IWPA includes all school facilities (except the leachfield), parking, residential homes, UST fuel oil tank and components of septic systems.

There is no evidence of a continuous, protective confining layer in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water from the well does not require treatment prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Yes	High	UST w/leak detection at school
Floor Drains in Boiler Rooms	Yes	Yes	Moderate	Consult with UIC program regarding compliance
Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields.
School facilities, parking and infiltration catchbasins	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential and hobby farming/animals	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel and manure management
Transportation Corridor	No	Yes	Moderate	West Street
Septic systems components	No	Yes	Moderate	Residential leachfields are in the IWPA
Transformers	No	Both	Low	Monitor transformers for potential leaks

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Non-conforming Zone I,**
2. **Underground storage tanks,**
3. **Floor drains in boiler rooms,**
4. **School facilities and athletic fields, and**
5. **Transportation corridors and parking.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all fuel oil deliveries and parking areas.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ The well is located within a pit and the casing should be extended above grade with a secure watertight cap, sanitary seal around the casing, and appropriate grading to prevent ponding of water near the well.

**2. Underground fuel oil storage** – There is one fuel oil UST located within the IWPA. If managed improperly, fuel oil tanks can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site.

**3. Floor Drain in Boiler Room** – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry

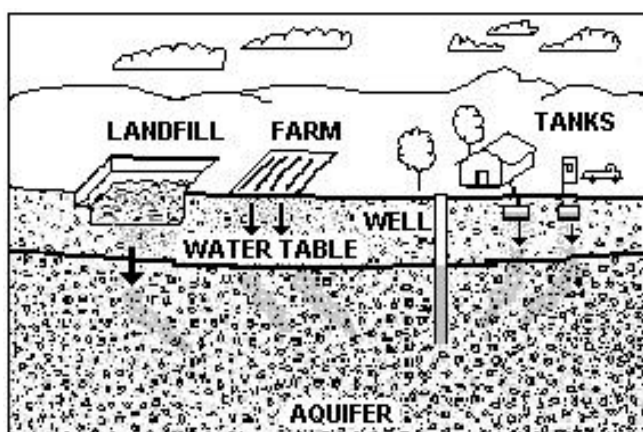


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

#### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- V Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- V Consider determining the discharge location of the drains. Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**4. School facilities and athletic fields** – Elementary schools generally use only household type hazardous materials. There are state and federal controls on some activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. Storm drains in the parking areas at the school drain directly into the ground.

#### Recommendations:

- V Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- V Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- V Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- V Review the handling of laboratory wastes to determine if a tight tank is appropriate.
- V Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- V Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**5. Residential Land Use** – There are two residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. There is also some hobby farming or animals within the IWPA. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of

contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- V Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**6. Transportation corridor** – West Street along with the access and parking areas for the facility are located within the Zone I and IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. Parking lot storm runoff is discharged through infiltration catchbasins.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.
- V Monitor the sodium levels in the water. If the levels begin to increase, consider contacting the local highway department regarding potentially reducing salt use area near the well.

**7. Hazardous Materials Storage and Use** – Any household hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I. The school district should comment to the various town boards regarding developments that may impact the school’s wells.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- V Protect the wellhead from surface water runoff and monitor activities around the well.

**Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.



- V Conduct regular inspections of the Zone I and IWPA.
- V Monitor activities and if there is evidence of increased activity or access, consider relocating the well.
- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

### **Training and Education:**

- V Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and certified operator.

### **Facilities Management:**

- V Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and consider registering to participate.
- V Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room and waste disposal.

### **Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain
- Very Small Quantity Generator (VSQG) information

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
GRANBY MOTEL



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Granby Motel
<i>PWS Address</i>	5 West State St.
<i>City/Town</i>	Granby, Massachusetts
<i>PWS ID Number</i>	1111015

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1111015-01G	128	434	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

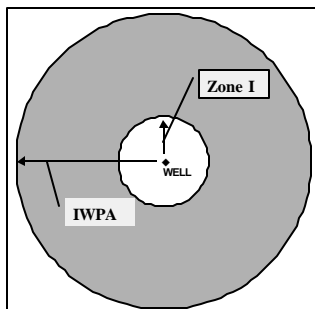
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: Zone I/ IWPA  
EXAMPLE Source  
Protection Area for Well #  
1 (1111015-01G)**

Zone I = 128 ft.  
IWPA = 434 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the sewer lines within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, Annual Statistical Reports, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report For Inter All Corporation

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 11, 2002

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	Inter All Corporation			
<i>PWS Address</i>	31 West Street			
<i>City/Town</i>	Granby, Massachusetts			
<i>PWS ID Number</i>	1111017			
<i>Local Contact</i>	Mr. Gino Maggi			
<i>Phone Number</i>	413-467-7181			

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111017-01G	100	405	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Inter All Corporation is a small manufacturer of pressure sensitive (glue-on) and iron-on embroidered emblems located in Granby. New, computer guided sewing machines were installed within the last year. The older machines, that utilized machine oils, although still on site, are no longer utilized. The facility currently employs approximately 20 people and is served by a single groundwater supply well #1. Currently available data indicate the well is a 10-inch diameter, 240 feet deep bedrock well with an estimated yield of approximately 37 gpm. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 100 feet and 405 feet, respectively based on the maximum water use determined from metered water volumes. The Zone I is the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

There is a sanitary sewer line on Route 202 and a Town sewer easement through the Zone I of Inter All Corp.'s well connecting the neighborhood north of the facility. Inter All Corp. and all of the residential homes within the IWPA are connected to the sewer. We were unable to determine if the sewer is double lined. Inter All Corp. has converted fully to natural gas and has removed the aboveground oil tank. The building housing Inter All Corp. had previously housed a dry cleaner and had a confirmed release of hazardous materials. However, a Class C, Release Action Outcome (RAO) Statement has been filed for the site. In addition, there is a gasoline station located south and east of Inter All Corp. on Route 202 that is a confirmed release site. That station is located outside of the IWPA and appears to be located hydraulically downgradient from the Inter All Corp. Contact the Department's Bureau of Waste Site Cleanup for additional information about these sites.

The well is located within an area mapped as sand and gravel overburden of unknown depth. The wellhead is approximately 24-inches above grade and the ground around the wellhead is graded to prevent ponding. There is no record of a confining, protective clay layer in the vicinity of the well. The bedrock is mapped as sedimentary sandstones (Mesozoic red beds) of the Jurassic Period. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time, although they do maintain a sediment filter. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination. Inter All Corp. has already taken measures to protect its water supply.

#### Key issues include:

1. **Non-conforming activities in the Zone I;**
2. **Sewer line; and**
3. **Confirmed hazardous materials/oil release site.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Sewer and pumping station (IWPA)	Yes	Yes	High	Monitor easement for evidence of leaks
Parking and transportation corridors	Yes	Yes	Moderate	Direct runoff away from the well, monitor for leaks and spills
Hazardous materials/oil confirmed release site – Gasoline station	No	No	--	Refer to Appendix A and DEP - BWSC for additional information**
Transportation corridor	No	Yes	Moderate	Establish communication with Town for emergency response.

- For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).
- For more information on confirmed release sites - please see <http://www.state.ma.us/dep/bwsc/bwschome.htm>



The overall ranking of susceptibility to contamination for Inter All corporation's well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Non-conforming activities in the Zone I** – Although the water supplier does own the entire Zone I area, there are structures and activities not related to the water supply located within the Zone I. The Zone I requirements prohibit any activity from the Zone I that is not directly related to the water supply. Please note that systems not meeting DEP Zone I requirements, must receive DEP approval prior to increasing water use or modifying systems. Structures, sewer line and parking lots are within the Zone I.

#### Recommendations:

- ✓ Control access to the wellhead area. Monitor for vandalism and consider installing a fence if necessary.
- ✓ Use Best Management Practices for handling chemicals and monitor vehicles used to access the area.
- ✓ Do not use/store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prepare an emergency plan for responding to an accidental release. Include contact with the local authorities.
- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any new or modifying any existing activities within Zone I.
- ✓ Monitor the parking area and shipping and receiving area for leaks and be sure runoff is directed away from the wellhead. Inform employees of the necessity to minimize leaks and accidental spills.

**2. Sewer and pumping station** – There is a sewer line within the Zone I and a sewage pumping station along Route 202 within the IWPA. It could not be ascertained whether the sewer is double lined. All of the residents and facilities in the Zone I and IWPA are connected to the sewer rather than utilizing on-site septic disposal.

#### Recommendation:

- ✓ Establish communication with the Town to be sure they are aware that you are a public water supplier and that the sanitary sewer is located in close proximity to your well. In this way the Town can be informed if a break occurs or if repairs are needed on the line.

Other activities noted within the Zone I and IWPA are parking and Route 202. Continue

monitoring water quality and activities within the Zone I and IWPA and establish communication with the Town regarding notification in the event of an emergency such as a break in the sewer line or an accidental release along Route 202. The Granby Pizza Palace is also located within the IWPA. The facility is connected to the municipal sewer and utilizes natural gas, although the parking lot is also within the IWPA. An electrical transformer is located on the pole in front of Inter All Corp. Contact the electrical utility to ensure that non-PCB oil is in the transformers. Continue to comply with all requirements established for the Class C RAO for the facility. Contact the Department's BWSC for information regarding the site on the south side of Route 202.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the susceptibility to contamination. Inter All Corporation is commended for taking measures to protect the water quality of your well such as berming the wellhead, connecting to the sewer and converting to natural gas.

#### Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

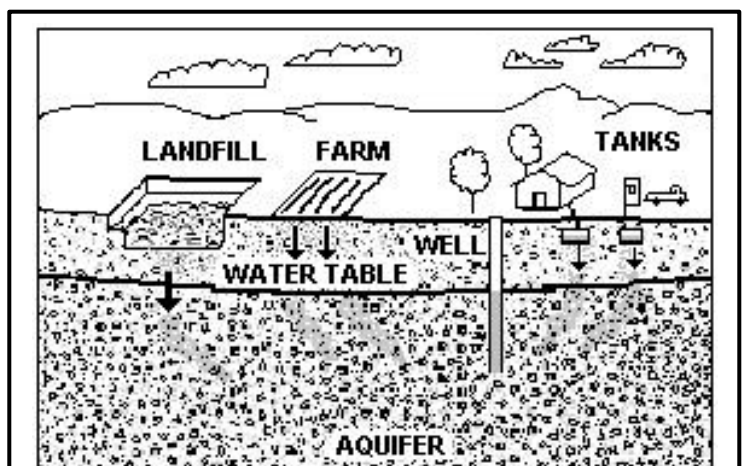


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Please review and adopt the key recommendations above and the following to further enhance the protection measures you have already taken.

### Priority Recommendations:

- ✓ Monitor activities within the Zone I.

### Zone I:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities and installing a fence if necessary, and posting signs.
- ✓ Conduct regular inspections of the Zone I and IWPA. Look for illegal dumping, evidence of vandalism, spills, etc.
- ✓ Use BMPs and control activities that could pose a threat to the water supply.
- ✓ Direct road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous (even household type) material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste. Utilize local household hazardous waste collection days.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Granby to establish and include Inter All's IWPA in a water Supply Protection District to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

## 5. Appendix

- A. Table of DEP Regulated Chapter 21E Hazardous Materials Release Sites

Y:/swqrt/wero/1111017

## Appendix A

### Bureau of Waste Site Cleanup - Tier Classified Oil and/or Hazardous Material Sites within or proximal to the Water Supply Protection Areas

DEP's data layer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)**

RTN	Release Site Address	Classification	Town	Contaminant Type
1-0012344	Getty Service Station	Tier IC – Phase IV	Granby	Oil
1-0000646	Inter All Corp.	Class C - RAO	Granby	--

For more location information, please see the attached map. The map lists the release sites by RTN.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
CINDY'S DRIVE IN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Cindy's Drive In
<i>PWS Address</i>	455 East State St.
<i>City/Town</i>	Granby, Massachusetts
<i>PWS ID Number</i>	1111020

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1111020-01G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

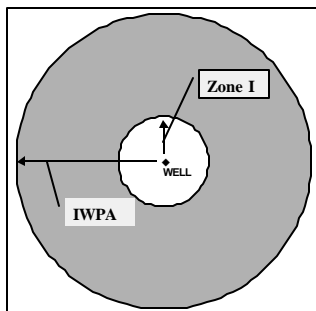
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1111020-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the agricultural activities within the Zone I and the IWPA. Other moderate threats include local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Crescent Valley Condominiums

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 9, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Crescent Valley Condominiums
<i>PWS Address</i>	Pleasant Street
<i>City/Town</i>	Granby, Massachusetts
<i>PWS ID Number</i>	1111025
<i>Local Contact</i>	Mr. John Sullivan
<i>Phone Number</i>	(413) 238-5344

<i>Source Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1111025-01G	210	520	Moderate
Well #2	1111025-02G	210	520	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Crescent Valley Condominium complex is located north of Route 202 and consists of two buildings with a total of 26 two-bedroom condominium units that are heated by a natural gas fuel source. Currently, approximately 78 people reside at the complex. Granby does not have a municipal water system or municipal sewer. However, South Hadley's sewer system has been extended into Granby along Route 202. In 1996, the condominium connected to the municipal sewer system, severed the lines to and abandoned their septic system. Since there is no available municipal water system, the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

complex is served by two wells, Wells #1 (01G) and #2 (02G). Well #2 serves as the primary source and Well #1 is used as a back-up or supplemental source.

The Zone I is the area immediately around the wellhead, while the Interim Wellhead Protection Area (IWPA) is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be smaller or much larger than the IWPA. The Zone I and IWPA radii for Wells #1 and #2 are 210 feet and 520 feet, respectively. The protective radii were based on approved withdrawal rates for the wells as determined through the New Source Approval Process pumping tests and property ownership. Please refer to the attached map that shows the Zone I and IWPA radii.

Well #1 is a 560 feet deep, 6-inch diameter well drilled into the bedrock aquifer; Well #2 is a 510 feet deep, 6-inch diameter well drilled that is approximately 50 feet from Well #1 and also drilled into the bedrock aquifer. Wells #1 and Well #2 are located in a field approximately 230 feet from the buildings and the casings extend greater than 18-inches above grade.

Mapping shows the complex is underlain by relatively thin (less than 50 feet) sand and gravel deposits over bedrock. The bedrock is mapped as Jurassic aged sedimentary rocks, conglomerate and arkose of the Portland Formation. There is no evidence of a protective till or clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Crescent Valley Condominium well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Zone I	-	-	-	Contact DEP before expanding or modifying the system. DEP approved the Zone I with the concrete encased sewer line and/or the natural gas in the Zone I.
Transportation corridors/parking	No	Both Wells	Moderate	Continue to manage stormwater and limit road salt usage. Inspect for leaks and spills.
Sewer line/natural gas line	Both Wells	Both Wells	Moderate	Two sewer lines encased in cement are within Well #1's Zone I. The natural gas line is in the zone I of both wells. DEP the Zone Is.
High density/low density residential	No	Both Wells	Moderate	Provide BMPs for household hazardous waste management. Use IPM for lawn maintenance.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

1. **Zone I;**
2. **Transportation corridors/parking; and,**
3. **Residential development.**

The overall ranking of susceptibility to contamination for the springs is moderate, based on the presence of at least one moderate threat land use or activity in the Zone I and/or IWPA, as seen in Table 2.

**1. Zone I –** Zone I restrictions allow only water supply related activities or non-threatening activities in Zone I. Currently, the system does meet DEP's Zone I requirements as the system was approved with a natural gas line and a concrete encased sewer line on the edge of the Zone I.

## Recommendations:

- ✓ Do not allow any additional no-water supply activities in the Zone Is.
- ✓ Keep the immediate area around the wells clear of brush and inspect the casings regularly to ensure the integrity of the cap and seal and to ensure there is no standing water near the casing. Install a berm sloping away from the casing if water is evident.

**2. Transportation corridor/parking –** The internal transportation and parking are located within the IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

## Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your wells.
- ✓ Continue to manage on-site stormwater to ensure it flows away from the Zone Is.

**3. Residential Land Uses –** The condominium uses the municipal sewer and natural gas for fuel. However, it is unknown what fuel sources and wastewater disposal method the surrounding residences utilize. If managed improperly, activities

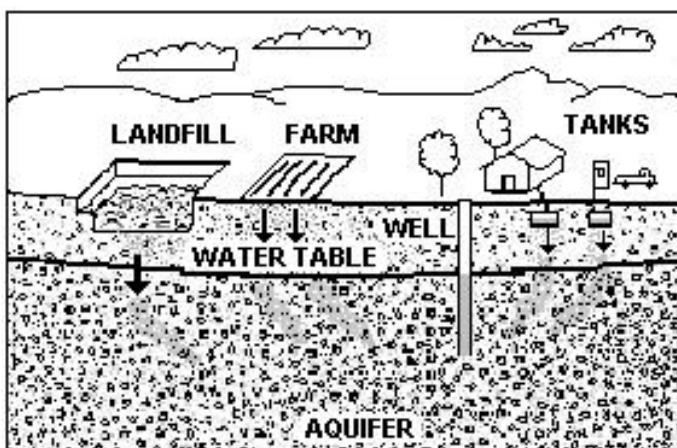


Figure 1: Example of how a well could become contaminated by different land uses and activities.

associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available on the following DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), and in attached to this report, which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will help to reduce the wells' susceptibility to contamination. Crescent Valley Condominium is commended for current practices of limiting access to the wellhead area and the original facility design. Review and adopt the key recommendations above and the following:

#### Facilities Management:

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

#### Planning:

- ✓ Work with your community to ensure develop a Wellhead Protection District and include your IWPA in the District along with other public water supplies in town.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Consider long term planning for the system that includes maintenance of the system.

#### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact sheet



# Source Water Assessment Program (SWAP) Report For Granville Center Water Company

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Granville Center Water Company</b>
<b>PWS Address</b>	<b>P.O. Box 154</b>
<b>City/Town</b>	<b>Granville, Massachusetts</b>
<b>PWS ID Number</b>	<b>1112000</b>
<b>Local Contact</b>	<b>John Stevenson, President</b>
<b>Phone Number</b>	<b>914-234-7459</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1112000-02G	304	912	Moderate
Cistern	1112000-03G	304	912	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Granville Center Water Company serves a small rural community supplying 37 residential and municipal connections that all utilize on-site septic disposal. The system consists of one bedrock well that can pump directly into the distribution system and to the storage cistern. The well (02G) for Granville Center Water Company is an 8-inch diameter bedrock well drilled to a depth of at least 150 feet (reported to be 210 feet) in 1950, located off of Blandford Road. The well has a Zone I of 304 feet and an Interim Wellhead Protection Area (IWPA) of 912 feet; both are based on metered water usage data. The Zone I is the protected area immediately around the wellhead; the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

larger or smaller than the IWPA. The public water system for the facility also includes a spring (01G), an emergency source that has been physically disconnected from the system and is located approximately 20 feet from the storage cistern. This report does not address the emergency spring source (01G). The cistern (03G) is a partially lined, belowground storage cistern; under certain hydraulic conditions, groundwater is contributed to the cistern. The DEP and water supplier are investigating methods of lining the cistern in order to eliminate groundwater contribution so that in the future, the cistern will act solely as a storage tank.

The well and cistern are located in an area USGS has mapped as a till and bedrock. There is no evidence of thick overburden in the vicinity. The bedrock geologic mapping identifies the bedrock as heterogeneous layering of amphibolite, gneiss, and schist with the thickest layers in the gneiss fraction. This type of aquifer has a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. Chlorine is added to the water at the wellhead serving the facility as a disinfectant. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming use in Zone I (02G)**
2. **Low Density Housing**
3. **Electrical Transformers**

The overall ranking of susceptibility to contamination for the well is moderate based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2. The cistern is not lined and is in close proximity to natural springs and surface water drainage and is therefore potentially susceptible to influence from surface water. The cistern has not been determined to be groundwater under the influence of surface water. Unless the cistern is lined additional water quality testing may be required. Based on that additional potential threat, the overall ranking of susceptibility to contamination for the cistern is high.

1. **Nonconforming use in Zone I-** The Zone I for Well #1 is nonconforming with respect to DEP land use restrictions, that allow only water supply related activities in the

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Low density housing with parking and septic systems; roadways	Well	Cistern and Well	Moderate	Prohibit parking along road, see septic systems brochure attached
Electrical Transformers	Well	Well	Moderate	Request information regarding PCB in MODF from your electric company

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Zone I. The public water supplier does not own and/or control all land encompassed by the Zone I of the well. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.

**2. Low Density Housing --** The Zone I for Well #1 contains Blandford Road and three residences with associated parking and septic systems. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. Another potential threat from residential users is mismanagement of household waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Monitor roadside for spills and leaks.
- ✓ Encourage residents to utilize local household hazardous waste collection days.
- ✓ Supply residents with information about BMPs for household hazardous waste management and lawn care.

**3. Electrical Transformer --** Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some transformers.

### Recommendations:

- ✓ Contact the local utility to determine if the transformers contain PCBs. If PCBs are present, urge their immediate replacement.
- ✓ Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm.

Other activities noted within the IWPA are aquatic wildlife and pet wastes. These are listed as low potential threats to ground water sources and are of minimal concern.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Granville Center Water Company is commended for discontinuing the use of the spring (01G) as a primary source. Granville Center Water Company should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- V Line the cistern as expeditiously as possible to eliminate all potential surface infiltration and groundwater contribution.
- V Consider well relocation of Well #1 if Zone I threats cannot be mitigated.

### Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Prohibit public access to the well and pump house by locking facilities, gating access roads, and posting signs.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.

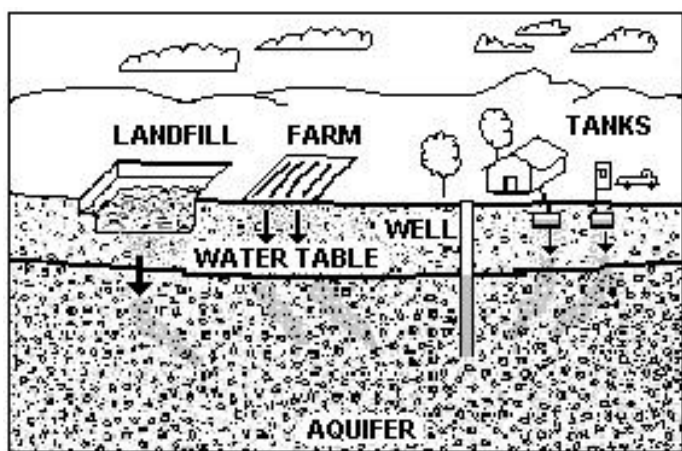


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba of the Western Regional Office at 413-755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Granville to develop Aquifer Protection District Bylaws and to assist you in improving protection to the well and IWPA.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓ Consider obtaining a conservation restriction for any land within Zone I that cannot be purchased.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

Y:\SWPQRT\SKIBA\1112000 Granville Cntr



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For DEM GRANVILLE STATE FOREST



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 12, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	DEM Granville State Forest
<i>PWS Address</i>	323 West Hartland Rd
<i>City/Town</i>	Granville, Massachusetts
<i>PWS ID Number</i>	1112002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Halfway Campground Well	1112002-02G	172	467	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

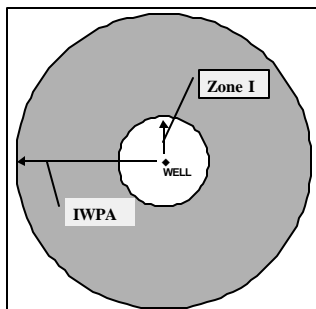
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for  
Halfway Campground Well  
(1112002-02G)**

Zone I = 100 ft.  
IWPA = ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as heating oil within the Zone I and the IWPA. Other moderate threats include parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ seal or protect floor drains from potential spills of hazardous materials such as heating oil;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report For Granville Village School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Granville Village School</b>
<b>PWS Address</b>	<b>State Route 57</b>
<b>City/Town</b>	<b>Granville, Massachusetts</b>
<b>PWS ID Number</b>	<b>1112006</b>
<b>Local Contact</b>	<b>Mr. Paul Petit, Business Manager</b>
<b>Phone Number</b>	<b>413-569-5391</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1112006-01G	148	446	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

## 1. Description of the Water System

The Granville Village School is a small, rural elementary school located on the south side of Route 57 in the center of town, with a total staff and student population of approximately 300. The well for the Granville Village School is located within the basement of the oldest section of the school building. Although the well was preliminarily tested to estimate the safe yield of the well, the Zone I of 148 feet and Interim Wellhead Protection Area (IWPA) of 446 feet, are based on actual water usage determined from metered data for the two highest months on record. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. The 6-inch diameter well was drilled to a depth of 236 feet in 1933. Recent well inspection and investigations conducted as part of the site spill remediation have determined the effective well depth as 187 feet due to siltation. USGS has mapped this site as a sand and gravel aquifer; however, based on the depth of the well, it is assumed that the well is completed in the bedrock aquifer. Geologic mapping identifies the bedrock as heterogeneous layering of amphibolite, gneiss, and schist with the thickest layers being gneiss.

At the time this report was prepared, the Granville Village School well water does not require and does not have treatment. The DEP requires public water suppliers to monitor the quality of the water. For current monitoring results, please refer questions to the local contact identified in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming uses in Zone I;**
2. **An Underground Storage Tank (UST) With Heating Oil;**
3. **Confirmed Hazardous Materials/Oil Release Site;**
4. **Improper Storage of Hazardous Materials;**
5. **Floor Drains in Boiler Room; and**
6. **Septic System**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Non-conforming uses in Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains school buildings, athletic fields, roads, parking areas, and recreational activities. State highway Route 57 is within the Zone I, which is the only part of the Zone I not owned and/or controlled by the public water supplier. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Confirmed release site	Yes	No	**	RTN 1-0000842, Tier 2. See Appendix A
Fuel Storage - Below Ground (UST)	Yes	No	High	10,000 gallon heat oil tank
Storage of hazardous materials	Yes	No	High	Remove hazardous materials and old boiler components near wellhead
Automotive repair and sales	No	Yes	High	VSQG and auto storage
Floor drain in boiler room	Yes	No	Moderate	Bring the floor drains into compliance with Department Regulations
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
School Structures, athletic fields	Yes	Yes	Moderate	Restrict fertilizer, pesticides, and salt use
Parking lot & roads	Yes	Yes	Moderate	Work with local officials to insure maintenance

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/). \*\* - See Appendix A.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to  $\frac{1}{2}$  mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Consider developing a new well that is in compliance with Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Underground Storage Tank (UST)** – There is a UST located on the southwest side of the school near the building, with a maximum content of 10,000 gallons of oil. The tank is a double walled tank with monitoring, installed in about 1990.

## Recommendation:

- ✓ USTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**3. Confirmed Oil Release Site** - The Zone I contains a DEP Tier II Confirmed Oil and/or Hazardous Material Release Site, indicated on the map as Release Tracking Number 1-0000842. The release was discovered in July of 1990 during the removal of an oil tank. Although contaminated soils were removed from the site, some impacted soils remain beneath the foundation of the building. A Response Action Outcome and an Activities and Usage Limitation have been submitted to the Department's Bureau of Waste Site Cleanup (BWSC). The drinking water program requires regular water quality monitoring including specific analyses to detect petroleum byproducts. For information regarding the location of this site refer to the attached map. Appendix A includes additional information regarding the Massachusetts Contingency Plan (MCP) and where additional information is available. Contact the BWSC at 413-784-1100 for more information.

## Recommendation:

- ✓ Comply with the requirements of the MCP process and continue monitoring as prescribed by DEP Drinking Water Program.

**4. Improper Storage of Hazardous Materials** -- There is storage of unused chemicals and old boiler components within the Zone I (located about 10 feet from the well head), and storage of uncontained gasoline jugs and floor finishers within the IWPA. In addition there is a portion of the floor that is still dirt (not cemented) from when the site remediation was conducted.

## Recommendations:

- ✓ Remove all hazardous materials from the Zone I.
- ✓ Seal the floor.

**5. Floor Drains in Boiler Room** -- Floor drains are located in the boiler room that discharge to the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be sealed or connected to a tight tank if it cannot be protected so as to guarantee boiler blow down, oil or other prohibited discharges are prevented from entering the floor drain. There must not be hazardous materials stored in the boiler room.

## Recommendations:

- ✓ Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - \* Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
  - \* Interim Actions: cease using the floor drains.
- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil could leak to the boiler room.

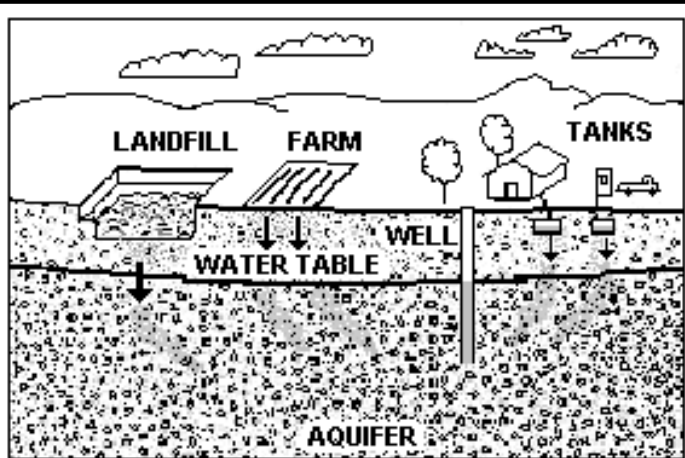


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

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### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ Require a policy and plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**6. Septic Systems** -- The school's septic system is located within the IWPA, as are the septic systems of the low density housing within the IWPA. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

#### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

Humphrey's Car Repair is located adjacent to the Granville Village School. Humphries is a registered as a Very Small Quantity Generator of hazardous waste. There are no floor drains and the facility appears to be well managed. There are several cars parked at the facility for sale and service. The school should maintain communication with Humphries and other neighbors located within the IWPA to ensure BMPs are employed to assist in protecting not only the school's water supply but also private wells in the community. Work with the Town to have any stormwater catch basins located within the IWPA inspected, maintained, and cleaned on a regular schedule.

On the outer edge of the IWPA is a crop field historically used for corn. Request that the landowners utilize Best Management Practices for their agricultural practices that include nutrient and pesticide management. Be sure that they are aware that your facility is a public water supply. If they do not already have a farm plan, refer them to the Natural Resource Conservation Service. Alternatively, they may follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*. Information on funding and other resources for agricultural management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Granville Village School should review and adopt the key recommendations above and the following:

#### Priority Recommendation:

- ✓ Consider well relocation if Zone I threats cannot be mitigated

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Prohibit public access to the well. Posting signs in appropriate, visible locations.
- ✓ Bring floor drains into compliance with UIC and Title 5 regulations.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If the Town intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers, deicers or hazardous materials within the Zone I.
- ✓ Upgrade to propane or natural gas as an alternate fuel for power sources.



**Training and Education:**

- ✓ Train custodial staff, groundskeepers, certified operator, and food preparation staff on proper hazardous material use, disposal, emergency response, and BMPs. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

**Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators. The facility is currently not registered as a generator of hazardous waste or waste oil.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Seal floor drains in the boiler room or connect to a tight tank. (See attachment)
- ✓ Remove hazardous materials from near the wellhead.
- ✓ As tanks age, upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials to develop Aquifer Protection District Bylaws and include the facility's IWPA in the district.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Agricultural:**

- ✓ Encourage farmers in the IWPA to seek assistance from the DFA and Natural Resource Conservation Service (NRCS) in addressing nutrient and pesticide management issues.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- UIC Fact Sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

**5. Appendix**

Table of DEP Regulated Chapter 21E Hazardous Materials Release Sites



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Great Barrington Fire District**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Great Barrington Fire District
<i>PWS Address</i>	20 Castle Street
<i>City/Town</i>	Great Barrington
<i>PWS ID Number</i>	1113000
<i>Local Contact</i>	Mr. Michael Vincent
<i>Phone Number</i>	413-528-0133

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

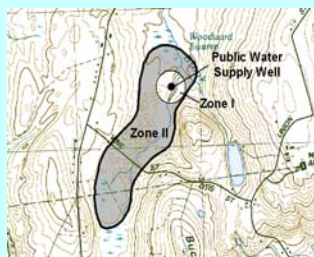
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**Zone II #:** 472

**Susceptibility:** High

Well Names	Source IDs
Well #1	1113000-01G

Great Barrington is a mid-size rural community in southwestern Massachusetts. The Town is located within the Housatonic River Valley in the heart of the Berkshires. The Great Barrington Fire District supplies water to some parts of the town of Great Barrington. The District owns and operates one groundwater source (1113000-01G), the main supply, and one surface water source (1113000-01S) that is designated for emergency use only. This report does not address the emergency, surface water supply. The groundwater source is an infiltration gallery located off of Hurlburt Road about 130 feet from the Green River. The infiltration gallery is a concrete chamber 226-feet in length, 4 feet wide with a gravel pack outside of the gallery. The water level in the Green River is somewhat controlled by a stone dam approximately 500 feet downstream of the gallery. The aquifer is a shallow sand and gravel aquifer along the Green River with no evidence of a confining clay unit in the vicinity of the source. The aquifer is therefore, considered highly vulnerable to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration from the ground surface.

The Zone I for the "well" is an oval protection area, 250 radial feet from the outside edges of the infiltration gallery. The Zone II was delineated through the SWAP program utilizing empirical data gathered from an extended duration pumping test, geological mapping and analytical modeling. Please refer to the attached map to view the boundaries of the Zone II.

Water from the source is chlorinated prior to distribution. For current information on monitoring results and treatment, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Great Barrington Fire District is a mixture of residential, agricultural, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high,

based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for the infiltration gallery is an oval shaped area with a radial distance of 250 feet from the edges of the gallery. An active corn/hay field, the District's motor control, chemical feed and storage buildings are all located within the Zone I of the source. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Although only water supply activities are allowed by regulation in the Zone I, many public water supplies were developed prior to the Department's regulation and contain non water supply activities such as homes, agriculture and public roads. The District does not have legal control over the activities within Zone I but does have a verbal agreement with the land owner to not utilize fertilizers or pesticides within the Zone I area.

#### Zone I Recommendations:

- ✓ Enter into Right-of-First Refusal or a Memorandum of Understanding agreement with the owner or purchase conservation restrictions to protect the area from development and land uses that may threaten the water supply. Agreement Options - Until land or funding is available for outright land purchase, attempt to obtain a Memorandum of Understanding or a Right of First Refusal. A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Refer to the information about a Right of First Refusal in the Appendices.

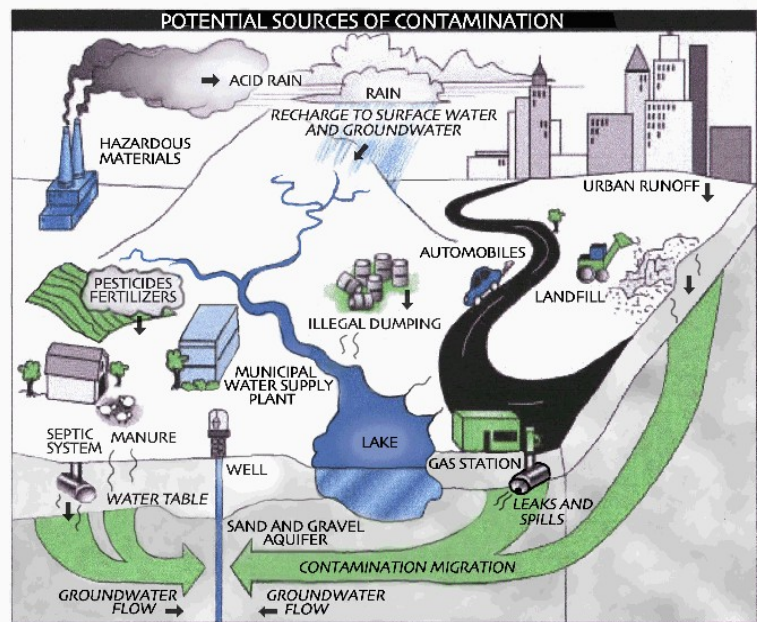
- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Contact the property owner to be sure they are aware they are within the Zone I and Zone II of the well. Provide

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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information about BMPs and monitor for compliance with the agreement to not use pesticides and fertilizers.

**2. Residential Land Uses** – Approximately 12% of the Zone II consists of residential areas. That area does not have public sewers therefore, all residential areas within the Zone II utilize septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins and drainage swales transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with Planning Boards and Boards of Health in Great Barrington and Egremont to manage new residential developments in the water supply protection areas. Work with the community to foster support and protection for the recharge areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Route 71 runs through the Zone II just south of the well and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

*(Continued on page 6)*

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

**Source Protection Decreases Risk**

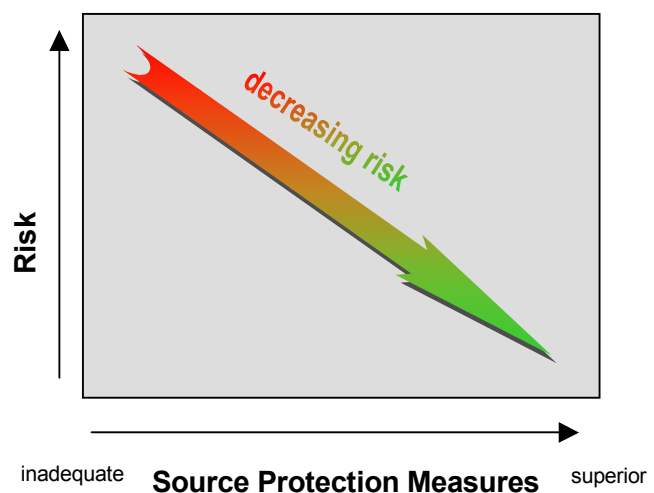


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Dairy Farms	2	M	Manure (microbial contaminants), pesticides: equipment improper handling
Livestock Operations	1	M	Manure (microbial contaminants), pesticides: equipment improper handling. Numerous small hobby farmers.
Manure Storage or Spreading	2	H	Manure (microbial contaminants), pesticides: equipment improper handling
Fertilizer and Pesticide use	Numerous	H	Cropland uses. Over application. None applied within Zone I area.
<b>Commercial</b>			
Airports	1	H	Fuels, de-icers, salt, and other hazardous chemicals: spills, leaks, or improper handling
Body Shops	1	H	Vehicle paints, solvents, and primer products: improper management
Service Stations/ Auto Repair Shops	2	H	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	2	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Furniture Stripping and Refinishing	1	H	Hazardous chemicals: spills, leaks, or improper handling
Medical Facilities	1	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Paint Shops	1	H	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks. Numerous small operations throughout Zone II.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling



Activities	Quantity	Threat*	Potential Source of Contamination
<b>Residential</b>			
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling
Fishing/Boating	River	L	Microbial contaminants, trash
Road and Maintenance Depots	1	M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	2	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	12 (Possibly more)	H	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	3	L	Hazardous materials and waste: spills, leaks, or improper handling or storage
Waste Transfer/ Recycling Station	1	M	Water contacting waste materials: improper management, seepage, and runoff
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Where applicable, contact the state or local highway departments to request that drains discharge stormwater outside of the Zone II.
- ✓ Consult with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Continue working with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control. Notify City and town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).
- ✓ Notify community officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Bruce Philbrick, at the local office in Pittsfield office at 413-443-6867 (his e-mail address is [bruce.philbrick@mapittsfi.fsc.usda.gov](mailto:bruce.philbrick@mapittsfi.fsc.usda.gov)). Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**4. Hazardous Materials Storage and Use** – Less than one percent of the land area within the Zone II is commercial or industrial land uses. Many businesses and industries, including small businesses, use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in USTs/ASTs. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground. The airport is of the greatest concern in the Great Barrington Fire District Zone II, with a high potential for leaks of hazardous materials such as jet fuel. Also there are a few facilities such as auto body shops, furniture strippers, a sawmill and gravel mining operations that may utilize hazardous materials and are currently not registered.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Work with planning agencies and/or communities to educate local small

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.

- ✓ Work with local Boards of Health and businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Work with local Boards of Health and businesses to review Massachusetts floordrain requirements. Refer to the brochure "Industrial Floor Drains" for more information and request Floor Drain regulations if they do not exist.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II or areas immediately adjacent to the Zone II contain a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Numbers 1-0014368. Refer to Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.

**6. Agricultural Activities** – There are several farms within the Zone II, including dairy farms, hay, vegetable, fruit and corn fields. Pesticides and

fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

#### **Agricultural Activities Recommendation:**

- ✓ Continue to work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service Farm Plan. They should also be aware of the Department of Food & Agriculture's regulation regarding the use of certain types of pesticides within a Zone II groundwater supply protection areas.
- ✓ Provide information to hobby farmers regarding Best Management Practices. Refer them to <http://www.state.ma.us/dep/brp/dws/protect.htm> for BMPs.
- ✓ Provide information about potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Bruce Philbrick, at the local office in Pittsfield office at 413-443-6867 (his e-mail address is [bruce.philbrick@mapittsfield.fsc.usda.gov](mailto:bruce.philbrick@mapittsfield.fsc.usda.gov)). Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**7. Protection Planning** – Currently, the Towns of Egremont and Great Barrington do not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). However, the District maintains communication with all host communities for the Zone II and Zone III areas. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

#### **Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team that includes the various water suppliers in Great Barrington and Sheffield's Water Company, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan". Work with the town Boards to develop comprehensive water supply protection and planning.
- ✓ Work with the Sheffield Water Company to coordinate protection measures for one another's communities. Include Egremont in the planning process to gain support for comprehensive protection of resources. Please refer to the enclosed map for areas of overlapping Zone IIs.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). Encourage adoption of controls that minimally meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Request that the Boards of Health adopt floordrain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition of land and fostering a relationship with abutters.
- The cooperative efforts with Alford and Egremont with respect to emergency response.
- The agreements for use of land within the Zone I area and the gentlemen's agreement not to use pesticides and fertilizers. However, this type of agreement should be formalized. Refer to the first item under Source Protection recommendations below.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Enter into Right-of-First Refusal or a Memorandum of Understanding agreement with the owner or purchase conservation restrictions to protect the area from development and land uses that may threaten the water supply. Agreement Options - Until land or funding is available for outright land purchase, attempt to obtain a Memorandum of Understanding or a Right of First Refusal. A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU. A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Refer to the information about a Right of First Refusal in the Appendices.
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue working with emergency response teams to ensure that they are aware of the Zone II and to cooperate on responding to spills or accidents and contact you.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies. Work with hobby farmers to educate them and supply guidance regarding BMPs.
- ✓ Work with the community to develop and implement a Wellhead Protection Plan.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### **➤ Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, and animal waste could be a potential source of microbial contamination.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, include adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning by-laws that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office (Pittsfield 413-443-6867) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>. Contact Bruce W. Philbrick the District Conservationist at 413-443-6867 or e-mail at [bruce.philbrick@mapittsfiie.fsc.usda.gov](mailto:bruce.philbrick@mapittsfiie.fsc.usda.gov)

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I/Zone II area posted with appropriate signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>NO</b>	Although the District has met DEP's best efforts for well-head protection, the protection area should be expanded and bylaws revised as recommended in the SWAP Zone II report. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model by-laws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with the neighboring municipalities of Egremont and Alford to develop wellhead protection controls and include the Zone II and III in a water supply protection district.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . Consider working with the Sheffield Water company to develop a comprehensive wellhead protection plan in Great Barrington and Egremont.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. The District already is on the "to be notified list" for all emergencies in Great Barrington and Egremont.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community. Work with the Sheffield Water Company to promote comprehensive protection in Great Barrington and with the Towns of Egremont and Alford.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>Partial</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.



1-0014368

## APPENDIX B:

### REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

#### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
185822	Simons Rock Of Bard College	84 Alford Street	Great Barrington	VSQG	Hazardous Waste Generator	College
	Autobody/Repair	78 Egremont Plain Road	Great Barrington	VSQG	Hazardous Waste Generator	Autobody/Repair
	Egremont DPW* and Transfer Station*	171 Egremont Plain Road	Egremont	VSQG	Hazardous Waste Generator	DPW/Transfer Station

\* Note: This facility is just outside of the Zone II.

#### Underground Storage Tanks:

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Berkshire Aviation Enterprises	Egremont Plain Road	Great Barrington	Airport	1 Wall	Approved In Tank Monitor	20,000	Gasoline
				1 Wall	Approved In Tank Monitor	4,000	Gasoline
Agar Oil*	154 Hurlbert Road	Great Barrington	Fuel distributor	1 Wall	Approved In Tank Monitor	10,000	Kerosene
				1 Wall	Approved In Tank Monitor	10,000	Diesel

				1 Wall	Approved In Tank Monitor	20,000	Fuel Oil
				1 Wall	Approved In Tank Monitor	20,000	Gasoline
				1 Wall	Approved In Tank Monitor	20,000	Gasoline
				1 Wall	Approved In Tank Monitor	20,000	Fuel Oil
				1 Wall	Approved In Tank Monitor	10,000	Diesel
				2 Wall	Approved In Tank Monitor	500	Gasoline
				2 Wall	Approved In Tank Monitor	500	Diesel
				1 Wall	Interstitial Monitoring	1,000	Fuel Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

\* Agar Fuel Storage facilities are just outside of the Zone II area

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0014386	50 Prospect Lake Road	Egremont	Oil

For more location information, please visit the DEP website for Bureau of Waste Site Cleanup <http://www.state.ma.us/dep/bwsc/sitelist.htm>.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for

**Housatonic Water Works Company**

**What is SWAP?**

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

**Susceptibility and Water Quality**

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Housatonic Water Works Company
<i>PWS Address</i>	80 Maple Avenue
<i>City/Town</i>	Great Barrington
<i>PWS ID Number</i>	1113003
<i>Local Contact</i>	Mr. James J. Mercer
<i>Phone Number</i>	413-528-1780

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

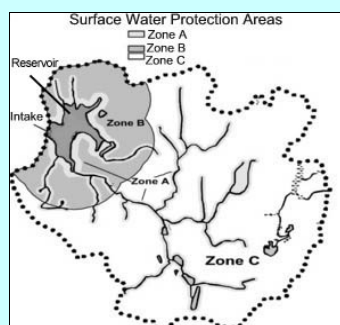
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes the following sections:**

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

### Surface Water Source

System Susceptibility

Moderate

Source Name:	Source ID	Susceptibility
Long Pond	1113003-01S	Moderate

Housatonic Water Company is a small, private water company that supplies water to Housatonic, a village located in the northwestern section of the towns of Great Barrington, Stockbridge and West Stockbridge. Great Barrington is a moderately sized town in South Berkshire County that is historically an industrial, agricultural and residential community located along the Housatonic River valley in the heart of Berkshires. The Housatonic Water Company owns and operates Long Pond Reservoir (1113003-01S) located southwest of village of Housatonic. Long Pond has a surface area of 115 acres and a storage capacity of 263 million gallons. The watershed area is primarily wooded with minor agricultural activity. A small percentage, (2%) of the land use is low density residential and institutional. Please refer to the attached map to view the boundaries of the protective zones.

Water from the reservoir is treated through a slow sand filtration plant then disinfected prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

Due to the nature of surface water supplies, the sources are considered highly vulnerable to potential contamination. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Zone A activities
2. Residential
3. Institutional Use
4. Forestry/Watershed Management
5. Protection Planning
6. Agricultural Activities
7. Presence of Beavers in Watershed

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of moderate threat land uses within the water supply protection areas, as seen in Table 2.

**1. Zone A activities** – The Zone A for Long Pond is the land area 400 feet away from the shoreline. The reservoir appears to be spring fed as there are no feeder streams into the reservoir. The protective by-law for Great Barrington provides restrictions to activities on land within 500 feet of all water bodies in Town, including the reservoir. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) regulates some of the activities allowed within the Zone

A. The greatest protection of the Zone A is for the water supplier to own or control the Zone A through Conservation Restrictions. The Housatonic Water Company owns approximately 30 acres or 5.5% of the land area in the watershed. According to the owners, the Water Company has rights to an area of 5 to 10 feet along the shoreline around the reservoir. There has been reported activity such as land clearing and recreational activity along the shoreline of the reservoir on land owned by a local conservation group. Only water supply activities are allowed in the Zone A. The Water Company does not own or control the entire Zone A area. However, many public water supplies were developed prior to the Department's regulations were promulgated and contain non-water supply activities.

#### **Zone A Recommendations:**

- ✓ Obtain a Right of First Refusal for acquiring the land within the watershed currently not owned by the Water Company.
- ✓ Consider purchasing the land or acquiring a conservation restriction on the land to minimize potential future threats.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone A.
- ✓ Keep any new non water supply activities out of the Zone A.
- ✓ Contact property owners/conservation group to be sure they are aware they are within the Zone A and watershed. Be sure they understand that access to the water is prohibited and activities in the Zone A are restricted.

**2. Residential Land Uses** – Although the map indicates approximately 13 acres of the watershed consists of residential areas, some of that area is associated with an institutional use. None of these residential areas have public sewers, therefore on-site septic systems are used. The institution's septic system leach field is reportedly outside of the watershed. If managed improperly, activities associated with residential type areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals

to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of

### **Benefits of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

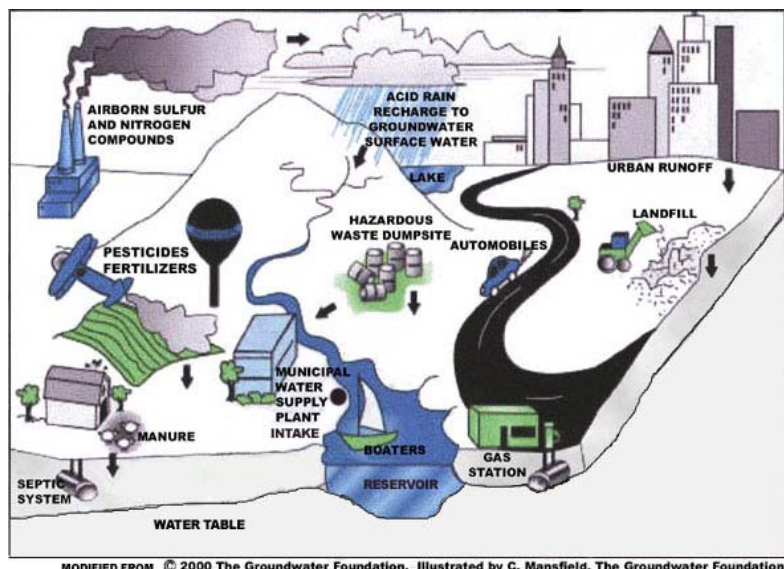


Figure 1: Sample watershed with examples of potential sources of contamination



the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Consider negotiating a Right of First refusal agreement or conservation restrictions for land not currently owned by the Water Company.

**3. Institutional Use** – An area to the southwest of the reservoir is owned by a small economic research and educational institute. The land use is primarily a conference and residential facility. However, the facility operates a small publishing and printing operation for their materials. The main facilities are located within the watershed. According to the owner of the facility and the site plan, the septic system is southeast of the main facility, outside of the watershed. The site plan for the facility shows a leachfield within the watershed but no distribution piping to that existing leachfield.

The facilities within the watershed consist of residences, offices, power house, “stone mansion” and the main building which houses the printing facilities. There is also a small “Tea house” owned by the institute within the Zone A that is not used. The facility has recently removed all underground fuel oil storage tanks and replaced them with individual Aboveground Storage Tanks located within each building. In addition, the main building has a large boiler room with a floor drain that ties into the building foundation drain. The drain discharges above ground to an area northwest of the main building within the watershed. There are low-use roadways and parking at the facility. De-icing

materials, automotive chemicals and other debris on roadways and in parking areas pose a minor threat to the watershed. The majority of the landholdings of the institute are forested. The Water Company communicates with the facility and it has a connection agreement to provide water to the facility in an emergency. The institute is a public water system, provides its own water and is in the process of developing a new well source.

**Recommendations:**

- ✓ Continue communication with the facility owners and monitor progress of the oil tank replacement at the facility.
- ✓ Consider negotiating a Right of First refusal agreement or conservation restrictions for land not currently owned by the Water Company.
- ✓ Work with local emergency response teams to ensure effective management of potential spills or responses at the facility. The Department discussed the need for an emergency response plan for the facility.



**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**Source Protection Decreases Risk**

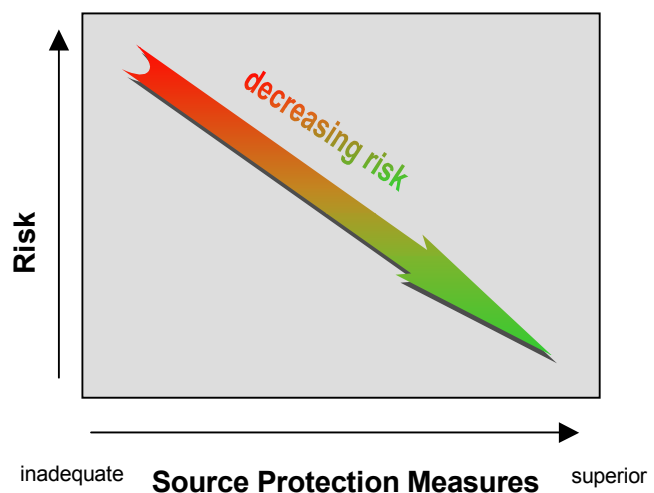


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Forestry Operation	1	L	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Haying of Fields	2	L	Equipment maintenance materials: leaks, spills, or improper handling
<b>Commercial</b>			
Printer	1	M	Printing inks and chemicals: spills, leaks, or improper handling or storage
<b>Residential</b>			
Fuel Oil Storage (at residences and Institute)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	4	M	Pesticides: over-application or improper storage and disposal
Septic Systems	4	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aquatic Wildlife	Historically	L	Microbial contaminants
Transportation Corridors	Low use	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**4. Forestry/Watershed Management** – There are small scale forestry operations occurring within the watershed on privately held land. In addition, there is land being managed by a conservation group. Reportedly there has been some clearing of land to near the water's edge. Currently the Water Company does not have a watershed/forest management plan.

- ✓ Develop a Watershed Protection Plan and consider including abutting land owners in the plan to evaluate the need for a forest inventory and forest management plan specifically designed for watershed management. Surface Water Supply Protection plans are an eligible activity under the Source Water Protection Grant Program.
- ✓ Evaluate whether there are any impacts associated with current activities and determine what if any, management strategies are required for public access to the watershed.
- ✓ Continue to inspect the watershed regularly.
- ✓ Communicate with neighbors and inform them of the local by-law and the existing M.G.L. regarding water supplies.
- ✓ Clearly delineate and post Water Company land as necessary to protect the resource.

**5. Protection Planning** – The Town of Great Barrington has Watershed Protection Districts and by-laws that regulate activities near surface water bodies in town. The Town is in the process of reviewing those by-laws. A Watershed Protection Plan has not been prepared and submitted for approval to the Department's Boston office for content and procedures. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The development of a successful Watershed Protection Plan is outlined in DEP's "Developing a Local Watershed Protection Plan" (see Appendix A for the full report).

**Protection Planning Recommendations:**

- ✓ Develop a Watershed Protection Plan. Consider applying for a Source Water Protection Grant and coordinate efforts with other water suppliers in Great Barrington to protect all public water supplies. Work within the community to establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Surface Water Supply Protection Plan".

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

protect.htm for a copy of DEP's guidance, "Developing a Local Surface Water Supply Protection Plan".

- ✓ Coordinate efforts with local officials to compare local watershed protection controls with current MA Watershed Protection Regulation 310 CMR 22.20B & C). If there are no local controls or they do not meet the current regulation, encourage adoption of new controls. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**6. Agricultural Activities** – Crop lands (hayfields) make up about 9% in the watershed of Long Pond. Although pesticides and fertilizers often are not utilized on hay fields, if they are, they have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. Machinery used for harvest or maintenance of the fields can leak oils and fluids that can potentially contaminate the water supply.

**Agricultural Activities Recommendation:**

- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies. Refer to <http://www.nrcs.usda>.

**Top 5 Reasons to Develop a Local Surface Water Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

gov . Natural Resource Conservation Service Centers: Berkshire CD(413) 443-6867.

- ✓ Provide information to hobby farmers on Best Management Practices. Distribute or refer land owners to DEP and DFA fact sheets available on the web site <http://www.state.ma.us/dep/brp/dws/protect.htm>.

**7. Presence of Aquatic mammals in Surface Water Watershed** – There is past history of aquatic mammals (beavers and muskrats) living in and near Long Pond but the water supplier inspects the reservoir. Aquatic mammals pose a potential threat of microbial contamination of the source from *Giardia* *Lambli*a and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water.

**Presence of Beavers in Surface Water Sources Recommendations:**

- ✓ Monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake. Monitor raw water quality and assess potential impacts.

Other land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains a few potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Communication with abutting property owners
- Vigilant inspection and monitoring of activities in the watershed.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue inspecting the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents and the conservation group on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watershed and to cooperate on responding to spills or accidents.
- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a best management practices for residential and recreational uses.
- ✓ Develop and implement a Forest Management Plan for water supply protection.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring, about May 1, the Department posts a new Request for Response (RFR- the grant application form) for the grant program. Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

#### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and local town boards.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities in the Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning By-laws, Health Regulations, and General By-laws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>YES</b>	The Town Watershed Protection by-law is in compliance DEP's regulations. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model by-laws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include the watershed in their protection controls.
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>NO</b>	Develop a surface water supply protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Water Company has sent a copy of their Emergency Response Plan to the local ER team. Update plan as necessary to support joint emergency response with fire department, Board of Health (BOH), DPW, and local and state emergency officials.
Does the municipality have a watershed protection committee?	<b>NO</b>	Work with planners and other water suppliers to establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>PARTIAL</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Request the BOH adopt floor drain and hazardous materials handling regulations and conduct inspections.
Does the PWS provide watershed protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the watershed.





# Source Water Assessment Program (SWAP) Report for Rudolf Steiner School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 22, 2001

Table 1: Public Water System (PWS) Information

<b>PWS Name</b>	<b>Rudolf Steiner School</b>
<b>PWS Address</b>	<b>6635 West Plain Road</b>
<b>City/Town</b>	<b>Great Barrington, Massachusetts</b>
<b>PWS ID Number</b>	<b>1113013</b>
<b>Local Contact</b>	<b>Director of Operations, Arthur Hildeth</b>
<b>Phone Number</b>	<b>413-528-4015</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
South well	1113013-02G	220	540	Moderate
North well	1113013-03G	100	411	High

## INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

### The Wells

Rudolf Steiner School is a rural, private elementary school with buildings located on both the north and south sides of West Plain Road in Great Barrington. The north building serves a student and staff population of approximately 50 people per day while the south building serves approximately 276 people per day. The original shallow well for the south building (well 01G) was abandoned in 1990 when the new South well (02G) was installed, tested and approved in accordance with the DEP's New Source Approval Process. The North well (03G) supplies water to the north building.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The South well has a Zone I protective radius of 220 feet and an Interim Wellhead Protection Area (IWPA) radius of 540 feet based on pumping test data and Zone I restrictions. Following a pumping test, the safe yield of the South Well was calculated to be approximately 37,440 gallons per day, (gpd) or 26 gallons per minute, (gpm). However, since the school and a property line are 220 feet from the well, the approved water withdrawal from the South well is limited to 7,000 gallons per day (5 gpm). Zone I restrictions allow only water supply related structures or activities within the Zone I, and the water supplier must own or control all of Zone I. Passive recreational activities are, with DEP approval, allowed under the Zone I restrictions. The North well has a Zone I radius of 100 feet and an IWPA radius of 420 feet based on daily use estimates from Title 5 septic system design flow criteria.

The South well, a 6-inch diameter well drilled to a depth of approximately 200 feet below ground, is located in the lawn approximately 220 feet from the building and is 550 feet from the Green River. The driller's log states that sand and gravel were noted from ground level to approximately 14 feet below ground, where bedrock was encountered. The bedrock was logged as interlayered beds of sandstone and shale to 41 feet, grading to limestone, the Stockbridge Formation dolomite, to the final well depth of 200 feet. The engineer's notes indicate the 34 feet deep casing was to be extended from 18 inches above ground to 76 feet below ground. The North well, a 6-inch diameter drilled well is located approximately 60 feet from the building. There is no other information about the depth or construction of the well, however it is assumed that the well is completed in the same bedrock formation as the South well.

Please refer to the attached maps of the Zone Is and IWPAs and Tables 2 and 3 for assessment information.

### The Water Quality

For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas for Rudolf Steiner School, which are potential sources of contamination. The overall ranking of susceptibility to contamination for the North well is high and for the South well is moderate, based on the presence of land uses or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

**Table 2: Table of Activities Common to the Protection Areas of Both Wells**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
School buildings	North well	South well	Moderate	Non-water supply structures and activities
Floor drains boiler room	North well	Both Wells	Moderate	Potential release of oil or boiler water to drain
Transportation corridor (West Plain Road)	No	Both wells	Moderate	Road salt, spills and runoff
Parking	No	Both wells	Moderate	Limit deicers, provide proper drainage from wells, and educate staff about leaks
Wastewater pipelines/septic components	No	Both wells	Moderate	Wastewater mains, tank and leachfield

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Table 2: Table of Activities Common to the Protection Areas of Both Wells (continued)**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Aboveground Fuel oil Storage Tank (AST)	No	Both wells	Moderate	Tank in Main (south) building in containment, tank in north building, does not have containment
Agricultural activities	No	Both wells	Low	Haying has minimal impact provided fertilizers are not used
Dairy Farm - Pesticide use (corn/alfalfa)	No	Both wells	High	Commercial application of pesticides
Dairy Farm - Manure spreading	No	Both wells	High	Liquid manure is spread on some of the fields

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Key Land Use Issues for the Wells include:**

1. **Non-conforming uses in Zone I (North Well)**
2. **Floor drains in boiler rooms**
3. **Agricultural Activities – (Dairy Farm)**

1. **Zone I (North well)** – The North well is non-conforming with respect to the DEP land use restrictions, which allow only water supply related activities in Zone I. The Zone I for the North well contains the school building and some sewer lines. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendations:**

- ✓ Do not conduct any additional activities within the Zone I. Monitor all activities within Zone I, use BMPs and train staff for emergency response. Contact MA DEP prior to conducting any new activities within Zone I.

- ✓ Consider replacement of sources or an alternative source of water if existing land uses cannot be mitigated. Contact the Department to discuss any expansion of the school well in advance of finalizing plans.

2. **Floor drains in boiler rooms** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. The boilers at the Steiner school are small, residential size boilers (rather than large industrial boilers) that do not use any water treatment chemicals. The main boiler room in the south building has a floor drain and a 50-gallon oil, day tank in the room; the boiler is between the tank and the floor drain. Boiler room #2 at the south building does not have a floor drain or a day tank. The north building boiler room also has a floor drain. The oil tank at the north facility is located within an adjacent storage room in the north building. The discharge points for the floor drains are unknown but are assumed to be the septic system. The maintenance office also has a floor drain, however, if there are no hazardous materials (such as paints or stains) stored in the office, therefore there is no threat from the drain in the office.

**Recommendations:**

- ✓ In the main boiler room in the South building, it is recommended that a sealed berm of sufficient height (approximately 2 or 3-inches) be placed on the floor between the day tank and the boiler to retain the 50 gallons if a failure occurred. Any holes or cracks in the floor behind the berm should be sealed at the same time. Consider installing a berm around

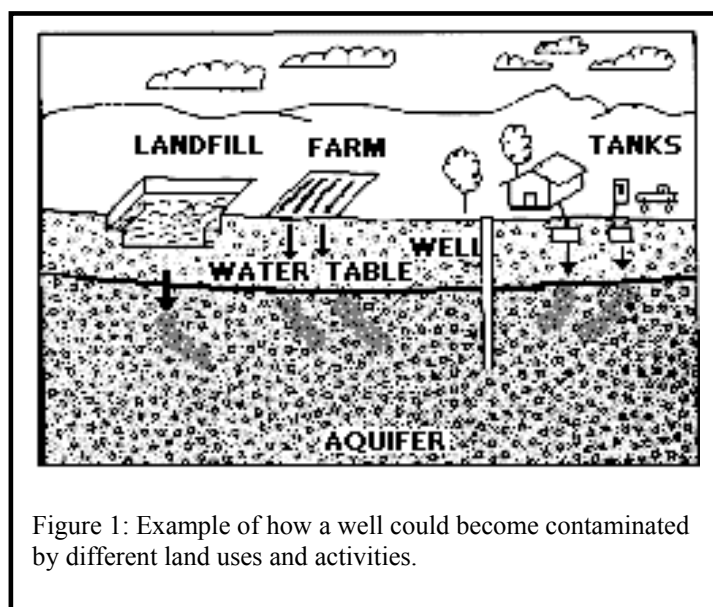


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to  $\frac{1}{2}$  mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact [Catherine Skiba](#) in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

the storage tank in the north building to contain 110% of the volume of that tank. If the boiler in the north building is moved to the back of the room (where the old boiler is currently located), consider installing a similar, shallow ( $\pm$  2-inches) berm, between the boiler and the floor drain. Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the bermed boiler. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. Request that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blowdown water cannot be disposed of in the sanitary septic system and must be disposed of off site.

3. **Agricultural Activities (Dairy Farm)** – There are agricultural activities of various degrees in and adjacent to the IWPA's of the wells. The activities range from simply haying the fields without any soil improvements to spreading liquid cow manure and applying pesticides on cultivated cropland for the dairy farm. The licensed applicator is responsible for complying with regulations regarding application of products within the IWPA of the school well and additionally, in the Zone II of the Great Barrington Green River Infiltration Gallery.

### Recommendations:

- ✓ Attempt to obtain an agreement from the farm owner/operator that they will:
  - Follow all applicable UMASS recommendations on Integrated Pest Management.
  - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
  - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.

Information on funding and other resources for agricultural management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>.

Other activities identified during the assessment that pose a potential threat to the water supplies are residential septic systems and household hazardous waste. Controlling runoff and monitoring parking areas for spills will minimize the potential threat from parking lot runoff.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

Rudolf Steiner School should review and adopt the following recommendations at the facilities:

### Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I for both wells.
- ✓ Please note that water systems not meeting DEP Zone I requirements (North well), must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.



### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

- ✓ Consider well relocation if Zone I threats cannot be mitigated or water quality is impacted (North well).
- ✓ Prohibit public access to the well and post signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check for accidental spills or leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Install berms and/or containment for oil tanks, sleeve the oil lines and seal any cracks or holes in the floor behind the berm.
- ✓ Request that your maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance.
- ✓ Maintain drinking water protection area signs at key visibility locations.

### **Training and Education:**

- ✓ Train staff and faculty on proper hazardous material use, disposal, handling, emergency response, and best management practices; include custodial staff, certified operator, faculty and other appropriate staff.

### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any potentially hazardous materials, such as paints or stains.
- ✓ Continue the current policy of using Best Management Practices (BMPs) for the use of pesticides on facility property.

### **Planning:**

- ✓ Contact local officials in town to notify them that your facility is currently within the Great Barrington, Green River Infiltration Gallery's Zone II and Aquifer Protection District to assist you in improving protection.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Agriculture:**

- ✓ Attempt to obtain an agreement from the farm owner/operator that they will:
  - Follow all applicable UMASS recommendations on Integrated Pest Management.
  - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
  - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.
- ✓ Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) or DFA.

### **Funding:**

- ✓ The Department's Source Water and Wellhead Protection Grant Programs provide funds to assist public water suppliers in addressing Wellhead and other source water protection through local projects. Protection recommendations discussed in this document may be eligible for funding under these Grant Programs. For additional information, please refer to the attached program fact sheets. Please note, the Request for Response (RFR - application forms) for the Grant programs are posted each fiscal year about May 1 and due back about June 30. Contact Catherine V. Skiba at 413-755-2119 for more information on the programs. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussions to assist the water supplier in his efforts to protect and improve the water supply and further review overall local drinking water protection measures.

#### **4. ATTACHMENTS**

- ◆ Map of the Public Water Supply (PWS) Protection Area
- ◆ Septic System Brochure
- ◆ Summary of Recommended Source Water Protection Measures
- ◆ *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*

#### **Additional Reference Documents:**

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- ◆ Best Management Practice information, and general water supply protection information
- ◆ MA DEP SWAP Strategy
- ◆ Land Use Pollution Potential Matrix
- ◆ Draft Land/Associated Contaminants Matrix





# Source Water Assessment Program (SWAP) Report for Monument Mountain Regional High School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
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## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 18, 2001

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Monument Mountain Regional High School
<i>PWS Address</i>	662 Stockbridge Street
<i>City/Town</i>	Great Barrington, Massachusetts
<i>PWS ID Number</i>	1113016
<i>Local Contact</i>	Director of Operations, John R. Komer
<i>Phone Number</i>	413-528-2410

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well # 1	1113016-01G	236	579	High
Well # 2	1113016-02G	100	420	High

## INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

### The Wells

Monument Mountain Regional High School is a rural regional school located on the east side of Route 7 in Great Barrington with a staff and student population of approximately 650 people. There are two water supply wells at the school. Well #1 is the main water supply for the school; well #2 supplies water to the greenhouse, its associated classroom and work areas.

Well 1, an 8-inch diameter well drilled to a depth of approximately 225 feet below ground in 1967. School records indicate difficulty drilling the well due to collapse of the formation. Bedrock was encountered at 4 feet below grade but the casing was extended to 200 feet below grade; the well casing extends approximately 18-inches

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

above the floor of a below ground vault. Although there was dampness on the floor, there was no evidence of flooding in the vault. The yield for Well 1 was estimated to be approximately 145 gpm based on a pumping test conducted at the time of construction. Well 2, a 6-inch diameter well is located in a crawl space accessed from the basement of the Plant Science classroom building. There is no information about the depth or construction of the greenhouse well although there is anecdotal information regarding an estimated yield of approximately 200 gallons per minute. This information could not be confirmed.

It is assumed that both wells are completed in bedrock. Geological maps of the area describe the bedrock as the Stockbridge Formation. The bedrock mapped at the greenhouse well is massive dolomite marble while the school well is mapped near the contact between the dolomite marble and layered, impure quartzose, micaceous dolostone. The structural geology map of the site shows fairly complex folding and faulting mapped both east and west of the well locations with nearly vertical bedding planes in the vicinity of the wells. The bedrock aquifer utilized by the two school wells has a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the ground surface into the aquifer.

Well 1 has a Zone I protective radius of 236 feet and an Interim Wellhead Protection Area (IWPA) radius of 579 feet based on metered water usage. Well 2 has a Zone I radius of 100 feet and an IWPA radius of 420 feet based on an daily use estimates from Title 5, septic system design flow criteria. Please refer to the attached maps of the Zone Is and IWPAs and Tables 2 and 3 for more assessment information.

### The Water Quality

For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

A number of land uses and activities within the drinking water supply protection areas for Monument Mountain Regional High School wells are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

**Table 2: Table of Activities Within the Protection Areas**

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
Hazardous materials storage	Well 2	Both Wells	High	Laboratories/auto repair/greenhouse
Transportation corridor (Route 7)	Well 2	Both Wells	Moderate	Road salt, spills and runoff
Parking lots and driveways	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Wastewater pipelines/septic components	Both Wells	Both Wells	Moderate	Wastewater mains, tank and leachfield
Stormwater discharge	No	Both Wells	Low	Road salt, spills and runoff
Landfill	No	No	--	The landfill is closed. There is no confirmed impact on the wells from the landfill.

\* - For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Key Land Use Issues for the Wells include:**

1. **Non-conforming uses in Zone I**
2. **Wastewater components**
3. **Hazardous Materials handling**

1. **Zone Is** – Both wells are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone Is for Wells 1 and 2 contain parking, school buildings and activities, sewer lines, septic tank (Well 1) and leachfield (Well 2), storm drains and Route 7. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendation:**

- ✓ Do not conduct any additional activities within the Zone I. Monitor all activities within Zone I, use BMPs and training for emergency response.

Contact MA DEP prior to conducting any new activities within Zone I. Consider replacement of sources or an alternative source of water if existing land uses cannot be mitigated. Contact the Department to discuss any expansion of the school well in advance of finalizing plans.

2. **Wastewater components** - The septic tank, kitchen grease trap and sewer lines are within the Zone I of Well 1. The tank for the greenhouse is within the Zone I for Well 2; the leachfield for the school is partially within the IWPA of Well 2. The

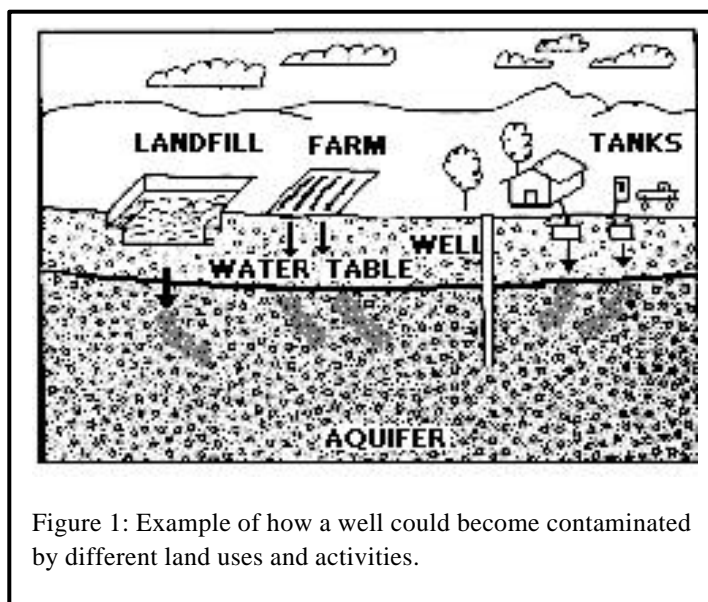


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**Table 3: Activities Specific to Well #1**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Underground Heating Oil Storage Tank (UST) (Unused)	Yes	No	High	The USTs is a backup to the propane and is not currently used.
High School	Yes	Yes	Moderate	Non-water supply structures in Zone I. Small quantities of hazardous materials are used and generated.
Floor drains (Underground Injection Control – UIC)	-	-	-	Discharge point for floor drain in auto mechanics shop and boiler room must be investigated and addressed.

**Activities Specific to Well #2 – Greenhouse Well**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Greenhouse - Pesticides and fertilizers	Yes	Yes	High	Containment and use must be managed.
Leachfield	No	Yes	Moderate	Laboratory and art wastes must be eliminated from waste stream.
Lawns and athletic fields	Yes	Yes	Moderate	Do not use pesticides or fertilizers.
Floor drains (Underground Injection Control – UIC)	-	-	-	Discharge point for floor drain greenhouses - investigate and address.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

school currently has until 2003 to acquire a groundwater discharge permit for the large Title 5 system. The school has active high school science (biology and chemistry) laboratories, art classes and an auto mechanics shop with a floor drain. The Plant Science Building also has greenhouses with floor drains. The discharge point for the floor drains is unknown. Title 5 prohibits disposal of non-sanitary wastewater into a Title 5 system. The alternatives for the floor drains include closure, connection to a tight tank or connection to the municipal sewer system with an oil water separator as appropriate. The options for the laboratory and art wastes include, connection to either a tight tank or municipal sewer.

### Recommendations:

- ✓ Review the information attached regarding the proper methods for closure of floor drains (refer to attachment 4 - *Industrial Floor Drain Brochure*). Contact the UIC coordinator for the Western Regional Office of the Department for additional technical assistance - (Rick Larson (413) 755-2207).  
Interim actions:
  - Cease using the floor drain immediately
  - Determine the discharge point of the floor drain, investigate as appropriate
  - The school is currently investigating the feasibility of connecting to the Great Barrington sewer system. Connecting to the sewer will resolve several issues for the school and add significant protection to the water supplies.

3. **Hazardous Materials Handling** – The school has science laboratories, art class studios and an auto shop. The volumes of potentially hazardous materials used and disposed of will likely require the school to register at a Very Small Quantity Generator (VSQG) of Hazardous Waste. Hazardous materials disposed of through the leachfield have the potential to impact the groundwater.

### Recommendations:

- ✓ Review the requirements for registration as a VSQG. To learn more, see the hazardous materials guidance manual at [www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm](http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm)
- ✓ Contact Hillary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us). Ms. Eustace will be able to provide assistance in preparing an inventory and plan for managing hazardous materials and waste at the school, specifically art, science and automotive technology products and waste.

Other activities identified during the assessment that pose a potential threat to the water supplies are the landfill, residential septic systems and household hazardous waste. The landfill was extensively studied at the time of closure. There was no confirmed impact on the schools well water quality. For further information regarding the landfill studies, contact the Springfield Office of the DEP's Division of Solid Waste at (413) 784-1100. Storm water discharges are within the IWPA of both wells. Use of BMPs and monitoring of parking areas will minimize the potential threat from parking lot runoff. With respect to the unused underground fuel oil storage tank, it should be determined if there is fuel in the tank. The tank should periodically be monitored or removed if there is no intent to use the tank. If the intent is to have an oil tank for a back-up fuel source, it is recommended to upgrade the tank to current standards. The schools utility transformer(s) are located in the school. Contact the utility to ensure only PCB free oil is in the transformers.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

### **3. PROTECTION RECOMMENDATIONS**

Monument Mountain Regional High School should review and adopt the following recommendations at the facilities:

#### **Zone I:**

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Consider connecting the facility to the Great Barrington sewer and public water systems.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check for accidental spills or leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Coordination with the DEP, State highway and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Well 1 is in a vault/pit. Generally pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18-inches above the ground as part of future modifications to Well 1. Unless the turbine pump is replaced with a submersible, this change would require the construction of a pump house as well.

- ✓ The unused underground fuel oil storage tank should be inspected, drained and removed if there is no intent to use the tank. Upgrade the tank to current standards if the intent is to have an oil tank for a back-up fuel source.

#### **Training and Education:**

- ✓ Train staff and faculty on proper hazardous material use, disposal, handling, emergency response, and best management practices; include custodial staff, certified operator, faculty and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

#### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html). Also, contact Hillary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us).
- ✓ Monitor all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ The utility transformers are located in the basement of the school. Contact the utility company to determine if the MODF has been replaced with PCB free oil. If PCBs are present, urge their immediate replacement.

#### **Planning:**

- ✓ Work with local officials in Great Barrington to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussions to assist the water supplier in his efforts to protect and improve the water supply and further review overall local drinking water protection measures.

#### **4. ATTACHMENTS**

- ◆ Map of the Public Water Supply (PWS) Protection Area.
- ◆ Septic System Brochure
- ◆ Summary of Recommended Source Water Protection Measures
- ◆ The Very Small Quantity Generator of Hazardous Waste – Fact Sheet
- ◆ One Day Hazardous Waste Collections - Fact Sheet

#### **Additional Reference Documents:**

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- ◆ Water Supply Protection Guidance Materials such as model regulations
- ◆ Developing a Local Wellhead Protection Plan
- ◆ Best Management Practice information, and general water supply protection information
- ◆ MA DEP SWAP Strategy
- ◆ Land Use Pollution Potential Matrix
- ◆ Draft Land/Associated Contaminants Matrix





# Source Water Assessment Program (SWAP) Report For Simon's Rock of Bard College

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Simon's Rock of Bard College
<i>PWS Address</i>	84 Alford Street
<i>City/Town</i>	Great Barrington, Massachusetts
<i>PWS ID Number</i>	1113017
<i>Local Contact</i>	Mr. John Verones, Superintendent
<i>Phone Number</i>	413-528-7239

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1113017-01G	100	406	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Simon's Rock of Bard College is a liberal arts college with a total staff and student population of approximately 400 people. The school is divided into two campuses; the Main Campus and the West Campus. The Main Campus purchases water from the Great Barrington public water system. The West campus contains only two academic buildings, the Leibowitz Building and the Arts and Recreation Center. Well 1 is the sole source of water for the West Campus and is on the north side of the Leibowitz Building approximately 10 feet from the building. The Zone I protective radius for Well 1 is 100

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

feet and the Interim Wellhead Protection Area (IWPA) radius is 406 feet. The protective radii were calculated based on the Title 5 estimated daily water use of 290 gallons per day (gpd). Please refer to the attached map that shows the Zone I and IWPA.

Well 1 is a 6inch diameter well drilled to a final depth of approximately 315 feet. There is no record of final construction of the well or of the materials encountered during drilling. Geologic mapping of the area indicates the overburden material at the well location consists of sand and gravel, stream deposits but does not indicate the depth of the deposits. The bedrock is mapped as carbonate (limestone and dolomite) rocks of the Stockbridge Group. Bedrock wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant barrier to prevent surface contamination from migrating into the bedrock aquifer.

Municipal sewer partially serves the facility. The Leibowitz building is connected to the town sewer while the Arts and Recreation facility utilizes an on-site septic disposal system. According to the facility manager, the school intends to connect to the municipal sewer in the future.

The well falls within the Zone II delineated for the Great Barrington Green River Infiltration Gallery. Therefore, if the Town adopts protective overlay district and bylaws for the Green River source Zone II, the well for Simon's Rock will fall within that district.

### Water Quality

The Simon's Rock of Bard College West Campus well water does not require and does not have treatment at this time. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

A few land uses and activities within the drinking water supply protection areas are potential sources of contamination. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the Zone I and IWPA, as seen in Table 2.

#### Key issues include:

1. **Nonconforming Activities in Zone I**
2. **Septic System components**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveway & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells.
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix.
Very Small Quantity Generator of Hazardous Waste	No	Yes	Low	Art wastes are collected and transported to a hazardous waste storage area on the main campus
Structures	Yes	Yes	-	Non-water supply activities in Zone I
Low Density Residential Uses	No	Yes	Moderate	Residential use of fertilizers, pesticides and household hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-feet to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, roads, parking areas and septic system components. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying the system or conducting any new non-water supply related activity within the Zone I.

The school has a comprehensive waste management plan prohibiting the disposal of anything other than sanitary waste through the septic system. They routinely collect the waste products from the art studios and dispose of them appropriately.

### Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well and connection to the Town sewer system.

2. **Parking and roadways** – Parking for the buildings is on a gravel lot within Zone I and there are public roadways in Zone I and the IWPA. Stormwater runoff picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants in runoff include lawn chemicals, pet waste, leakage from dumpsters, and contaminants from vehicle leaks or accidents.

### Recommendation:

- ✓ Manage storm runoff from parking areas so that it flows away from the well. Consider paving the parking area and installing storm drains with oil water separator and sediment sumps.
- ✓ Minimize automobile parking in Zone I, as feasible.

Other land uses identified during the assessment include Very Small Quantity Generator of Hazardous Waste and low-density residential development. The college has a comprehensive Emergency Response Plan and a hazardous material handling policy and plan. Diligence in compliance with the VSQG requirements and education of staff and students will serve to protect the public water supply. Implementing the following recommendations will also reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The staff of the Simon's Rock of Bard College is commended for current diligence and the protection measures in place such as the arts material handling and the partial connection to the municipal sewer. The school, in conjunction with local officials should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Connect to municipal wastewater disposal system.
- ✓ Post drinking water protection area signs in visible areas along IWPA. Inform faculty, staff and students regarding appropriate disposal and materials handling.

### Zone I and IWPA:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ Monitor all non-compliant activities in the Zone I.

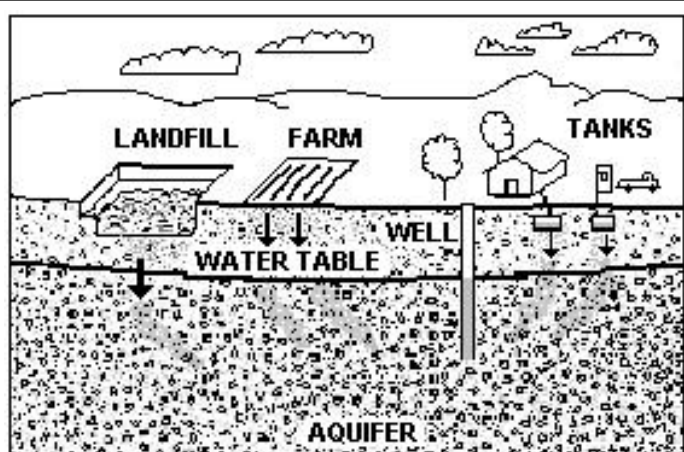


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Consider connecting to the Great Barrington sewer system and water system.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check parking areas for accidental leaks, etc.
- ✓ Maintain road and parking lot drainage.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Educate the students and staff about protection of the water supply.

### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, faculty groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum as appropriate.
- ✓ Communicate with your community to ensure that stormwater runoff from roads is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Maintain current standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/brp/dws/dwspubs.html](http://www.state.ma.us/dep/brp/dws/dwspubs.html).
- ✓ Continue to ensure non-sanitary wastewater discharges do not go to the on-site septic systems. An alternative to pick-up and disposal for art studios is discharge to a tight tank or connect to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be inspected and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete, surface sanitary seals around wellheads should slope away from well and the well casing should extend above ground.

### Planning:

- ✓ Contact local officials in Great Barrington to be sure they are aware that your well is located within the Zone II of the Town's supply. Any Aquifer Protection District Bylaws would also assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001

"Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response (grant application) for the Grant program (RFR). The RFR is generally available and due back into the DEP on or about May 1 and June 30, respectively. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

### **3. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Eagleton School Main Campus

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 14, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Eagleton School Main Campus
<b>PWS Address</b>	446 Monterey Road
<b>City/Town</b>	Great Barrington, Massachusetts
<b>PWS ID Number</b>	1113023
<b>Local Contact</b>	Bruce Bona
<b>Phone Number</b>	(413) 528-4385

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Kitchen/Classroom (01G)	1113023-01G	138	440	Moderate
T House Well (02G)	1113023-02G	125	433	Moderate
Well No. 3	1113023-03G	235	576	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Eagleton School is located in Great Barrington, a medium sized town in south Berkshire County. The school is a residential school for boys age 9 through 22 with emotional and/or learning difficulties. The staff and student population is presently approximately 60 people per day. Great Barrington does have a municipal water system and wastewater treatment facility however, they do not serve this section of town. Therefore the school is



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

served by three, on-site water supply wells and an on-site wastewater disposal system. The school's three wells are located on the north side of Monterey Road; the Kitchen/Classroom Well 01G, is located immediately adjacent to the pool and a parking area; the T-House Well 02G, is located next to a day use building east of the parking area; the Mountain Well 03G, is located remote from the facility and was developed and tested through the New Source Approval Process. However, Well #3 has not yet been activated for use in the system.

The facility is located on the side of a brook valley where the bedrock rises sharply with numerous locations of bedrock outcrop. Geologic mapping in the area indicates shallow overburden of till. The bedrock mapping shows a contact through the site between the carbonate rocks of the Stockbridge Formation and the metamorphic rocks of the Berkshire Highlands/Green Mountain Core.

The Zone I is the area immediately around the well where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The Zone I radius and IWPA radii of well 01G are 138 feet and 440 feet; the Zone I and IWPA radii for well 02G are 125 feet and 433 feet; and the Zone I and IWPA radii for well 03G are 235 feet and 576 feet. There is no evidence of a confining clay layer or a thick till layer at the site. In fact, as noted previously, there are numerous locations of exposed, fractured bedrock on-site. Therefore, the Department has determined that the wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Oil Storage (at residences)	No	All Wells	Moderate	Spills, leaks, or improper handling of fuel oil from surrounding residences
Lawn Care / Gardening	01G & 02G	All Wells	Moderate	Over-application or improper storage and disposal of pesticides and fertilizers
Septic Systems Components	01G & 02G	All Wells	Moderate	Microbial contaminants, and improper disposal of hazardous chemicals
School/parking	01G & 02G	All Wells	Moderate /High	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transportation Corridor	No	All Wells	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

1. **Non-conforming Zone Is;**
2. **Residential Land Uses;**
3. **School; and**
4. **Transportation Corridor.**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA's, as seen in Table 2. The proximity of Well #1 to parking and other activities prompted the Department to consider the school and parking a moderate to high threat to well #1. The Department's conditional approval for Well #3 is that Well #1 must be abandoned as a source of water.

1. **Non-conforming Zone Is** – Currently the wells do not meet DEP's restrictions, which only allow water supply related activities or other non-threatening activities in the Zone I. The school's Zone Is (except 03G) contain school buildings, roads/driveways, parking areas, a recreational pool, and pool chemicals. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

## Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements, as is reasonable.
  - ✓ Do not store pool chemicals within the Zone I unless they are within containment. Do not use or store pesticides, fertilizers, or road salt within Zone I.
  - ✓ Restrict automobile parking within the Zone I of Well 02G and direct runoff away from the well.
2. **Residential Land Uses** – Portions of several residential properties fall within all of the IWPA's. All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:
    - ♦ **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.

**Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- ♦ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- ♦ **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

## Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet

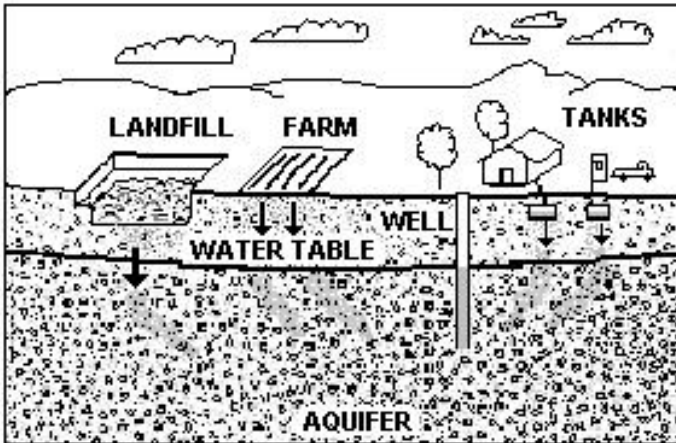


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

"Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

- ✓ Promote BMPs for stormwater management and pollution controls.

3. **School** – Activities associated with schools commonly involve hazardous materials such as fuel oil and laboratory, art, photographic, machine shop, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed into septic systems.

#### School recommendations:

- ✓ Implement BMPs that can be used to reduce the risk of contamination.
- ✓ Provide source protection education for maintenance staff, food preparation staff, teachers and students.
- ✓ Provide appropriate disposal for all cleaning and household hazardous waste at the school.

4. **Transportation Corridor** – Monterey Road (Route 23) is located within the IWPA's. Major roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

#### Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA's are included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Eagleton School is commended for development of Well #3 and for the use of a propane generator. Eagleton School Main Campus should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers, road salt, or pool chemicals within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ If the school intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into the school curriculum.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

**Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Healthy Schools Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment Program (SWAP) Report for American Institute for Economic Research

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 14, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>American Institute for Economic Research</b>
<i>PWS Address</i>	<b>P.O. Box 1000, Division Street</b>
<i>City/Town</i>	<b>Great Barrington, Massachusetts</b>
<i>PWS ID Number</i>	<b>1113028</b>
<i>Local Contact</i>	<b>Mr. Frederick Harwood</b>
<i>Phone Number</i>	<b>413-528-1216</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Spring	1113028-01G	343	467	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Groundwater sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

American Institute for Economic Research (AIER) is a facility located in the northeast corner of Great Barrington in south Berkshire County. The facility consists of several buildings that include office space and a small printing operation to publish their literature. The regular staff population is approximately 30 people per day but AIER also conducts seminars and is staffed by student interns. The facility is presently served by a single potable supply spring source (1113028-01G) located north of the facility in Alford. Periodically the spring source has inadequate yield to satisfy the water requirements at AIER. Under those conditions the facility used untreated water from the



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

adjacent Housatonic Water Company's Long Pond Reservoir. The intake for AIER was prior to the Housatonic Water Company's treatment facility and therefore, the Department has prohibited the use of untreated water from Long Pond. Prompted by the inadequate supply from the spring and the determination, through microscopic particulate analysis (MPA), that the spring source was under the influence of surface water and would require treatment, AIER is pursuing development of a new well source. At the time this report was prepared, the new source permitting process was near completion. Once that source (Well #1) is approved to come on-line, this report will be updated to include Well #1.

The Zone I for a spring is a square area while the Interim Wellhead Protection Areas (IWPA) is a radial area centered on the source. The size of the protection areas are calculated based on the measured or estimated volume of water used from the source. The estimated daily water use at the facility is 3,000 gallons per day. The length of the sides of the square Zone I area is 343 feet while the radius of the IWPA around the spring is 467 feet. The entire Zone I and IWPA area is forested with no other land use activities. All spring sources are considered to be vulnerable to activities on the land surface and all springs are considered to be subject to influence of surface water. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The physical nature of the spring source makes it susceptible to natural microbial contaminants.

### Key issues include:

#### 1. Wildlife/Natural microbial activity

The spring is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the spring is moderate, based on the presence of one moderate to high ranking threat land use or activity in the IWPA, as seen in Table 2.

**1. Wildlife/Natural microbial activity** – Though the area is relatively remote, the spring source was determined to be under the influence of surface water and therefore vulnerable to microbial contamination. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc. Microorganisms are microscopic creatures such as bacteria, viruses, and protozoa. Because some microorganisms are known pathogens, or disease causing agents, microbial contamination of public drinking water supplies poses a serious threat to human health.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Wildlife	Yes	Yes	Moderate	The potential threat to this source is from natural sources and not anthropogenic land use.

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Some known contaminants of concern in drinking water include: Bacteria, Escherichia coli (E.coli), Viruses, and Protozoa. Bacteria, viruses, and protozoa when ingested in drinking water can cause a number of infectious waterborne diseases such as cholera, typhoid, hepatitis, and infectious gastrointestinal diseases like cryptosporidiosis and giardiasis. Symptoms of waterborne disease may include fever, fatigue and weight loss (common in viral cases), vomiting, abdominal cramping, diarrhea, and stomachaches. In the most severe cases waterborne diseases can prove lethal.

### Recommendations:

- ✓ Some microbial contaminants can be removed by water treatment coagulation and filtration processes. Disinfection has been proven effective against bacteria and viruses, but protozoa, such as Cryptosporidium, are very resistant to chlorination alone. Other treatment methods are necessary to address Cryptosporidium such as ozonation, UV disinfection, or filtration.
- ✓ Continue the process of development of the new well.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the spring's susceptibility to contamination. The American Institute for Economic Research is commended for current protection measures including the active search to locate a new water source.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the spring.

### Facilities Management:

- ✓ Concrete protective seals on the spring (earthen or concrete) should slope away from the source and surface runoff should be directed around the spring.

### Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet

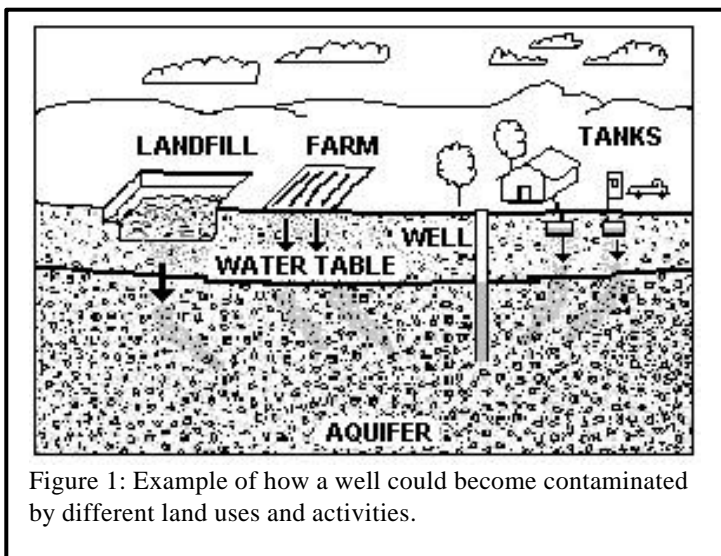


Figure 1: Example of how a well could become contaminated by different land uses and activities.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
PEPPERMILL RESTAURANT & LOUNGE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Peppermill Restaurant & Lounge
<i>PWS Address</i>	999 South Main St
<i>City/Town</i>	Great Barrington, Massachusetts
<i>PWS ID Number</i>	1113030

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well	1113030-01G	159	455	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

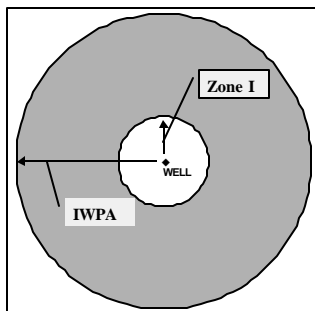
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well  
(1113030-01G)**

Zone I = 159 ft.  
IWPA = 455 ft.



### How Was My Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and/or the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the parking and local roads within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you during a site visit, water quality data and/or from other sources of information.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Greenfield Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Greenfield Water Department
<i><b>PWS Address</b></i>	384 Deerfield Street
<i><b>City/Town</b></i>	Greenfield, Massachusetts
<i><b>PWS ID Number</b></i>	1114000
<i><b>Local Contact</b></i>	Ms. Sandra Shields
<i><b>Phone Number</b></i>	413-772-1539

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Class B River Intakes

Class B water sources do not have Zone A , B and C protection areas as the Class A sources do. For the purposes of this report, an "Emergency Planning Zone" has been delineated. The **Emergency Planning Zone** is the land area within 400 feet of both sides of the river including all tributary streams and surface water bodies.

## Section 1: Description of the Water System

**Water Sources**  
**System Susceptibility:** **High**

**Ground Water Sources:** **Susceptibility: High**

**MA GIS Zone II ID#: 145**

<b>Source Name:</b>	<b>Source ID</b>
GP Well #1	1114000-04G
GP Well #2	1114000-05G
GP Well #3	1114000-06G

**Surface Water Sources:** **Susceptibility: High**

<b>Source Name:</b>	<b>Source ID</b>
Leyden Glen Reservoir	1114000-01S
Green River	1114000-03S

Greenfield is a middle sized industrial, agricultural and residential community located in northwestern Massachusetts near the Vermont border. Greenfield's water supplies are all located within the Green River basin. The Green River flows south into the Deerfield River which forms a portion of the southern border of the town; the Deerfield River flows into the Connecticut River which forms a portion of the eastern border of Greenfield. Greenfield Water Department maintains and operates five public water supply sources. The three Millbrook Wells: Wells #1 (1114000-04G), #2 (1114000-05G), and #3 (1114000-06G) are located in close proximity to each other and withdraw water from the same, semi-confined, deep buried valley, sand and gravel aquifer. In addition, there are two surface water sources: the Leyden—Glen Brook Reservoir (1114000-01S) and the Green River intake (1114000-03S). The surface water supplies are located in the uplands, north of Greenfield. The bedrock in the vicinity of the reservoirs is generally described as part of the upper Leyden formation composed of metamorphosed argillite with interbeds of quartzite.

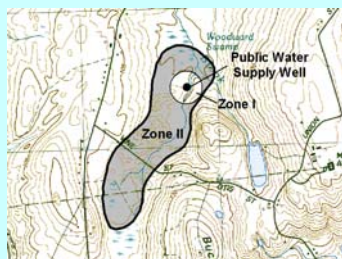
The wells are located in the northeast section of the City. The wells draw water from a confined to semi-confined, sand and gravel aquifer located within a buried, bedrock valley. The bedrock valley, comprised primarily of metamorphic and sedimentary rocks, was deepened by advancing glaciers and later filled in with sand and gravel from the receding glaciers and overlain by silt and clay from glacial Lake Hitchcock and Lake Lawrence some 12,000 years before present. Recent alluvial deposits cover the entire valley area. The confining clay layer is primarily contiguous through the center of the buried valley with the clay layer pinching out toward the edges of the aquifer allowing significant recharge along the basin boundaries.

Each well has a Zone I radius of 400 feet. The Zone II for the wells (#145) includes an area of about 293 acres extending north into the Town of Bernardston. The Zone II, funded through the Aquifer Land Acquisition program, was delineated utilizing pumping test data, analytical modelling and aquifer mapping. The Zone II watershed area is 29% forested and 50% crop or pasture.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



About 50% of the land area is protected from development, primarily through municipal ownership and agricultural restrictions. The watershed for the Leyden Glen Reservoir includes over 3000 acres of land, much within the community of Leyden. Approximately 70% of the watershed is forested and 56% is protected open space through methods such as municipal or state ownership, conservation or agricultural restrictions or other development limiting restrictions.

The Green River is classified as a Class B water body, though the Massachusetts Department of Environmental Protection (the Department) is presently reviewing its Class B status. A Class B water body source such as the Green River does not have Zone A, B and C protection areas, as does the Leyden Reservoir, a Class A water body source. For the purposes of the SWAP assessments, a 400 foot setback area along the river and all feeder streams has been delineated for Class B water body sources that is referred to as an "Emergency Planning Zone". Land uses and activities within this zone are of particular concern for source protection and emergency planning because of their proximity to the water supply.

The portion of the Green River source watershed that is in Massachusetts, includes 4,075 acres in Leyden and Colrain; 80% of that watershed area is

forested and 50% is the total area is protected open space through either municipal or state ownership or through Conservation or Agricultural Restrictions that may be held by private land owners. The remainder of the watershed is located in the southern Vermont communities of Halifax and Guilford. The watershed in Vermont is primarily low density rural residential and forested. Please refer to the attached maps that illustrate the protection area boundaries. Massachusetts Department of Environmental Protection would like to thank the staff of the U.S. Environmental Protection Agency for their assistance and the Vermont Agency of Natural Resources which supplied the maps and land use information for the watershed in Vermont.

Water from the Green River flows through roughing filters and is then filtered along with the water from the Leyden Reservoir through a slow sand filtration plant and disinfected prior to distribution. The water from the wells is pH

adjusted and treated for corrosion control prior to distribution. The Water Department also maintains the capability to chlorinate the well water, if necessary. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

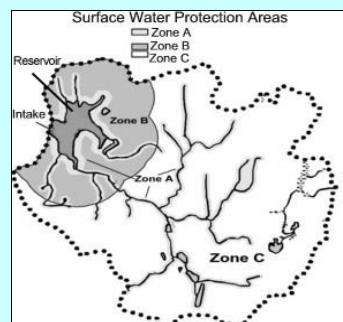
## Section 2: Land Uses in the Protection Areas

The Zone II of the Millbrook Wells and the watersheds for the Leyden Glen Reservoir and the Green River intake are primarily forested with some residential and agricultural land uses. Rural residential and a small percentage of commercial and light manufacturing land uses are also noted in the watersheds. One facility within the Green River source Emergency Planning Zone was identified on the land use map as an industrial facility based on aerial photograph review. The facility is actually an indoor, sport, shooting range with containment facilities; there is no manufacturing conducted at that facility.

The Zone II area of the wells consists primarily of rural residential and agricultural uses with some light manufacturing, interstate Route 91, State Route 5 and an active railroad line run through the entire recharge area. The aquifer is partially confined meaning that there is a confining (protective) clay layer overlying the productive sand and gravel. The clay layer provides some protection from contamination at the ground surface, however, the clay layer is not continuous throughout the entire valley and is discontinuous along the edges and the headwaters of the valley. Therefore the aquifer is considered to be

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C or and Emergency Planning Zone for Class B intakes.





highly vulnerable to contamination. Surface water bodies are by their nature considered highly vulnerable to contamination.

Greenfield Water Department has been very proactive in water supply protection. They have purchased Conservation Restrictions for some of the agriculture land within the Zone II, conduct land use and UST inventories within the protection areas and participate with watershed teams in Vermont to protect watershed lands in Vermont. The Water Department conducts frequent inspections of watersheds and recharge areas and provides household hazardous waste disposal for residents within the Zone II from neighboring communities. The Greenfield Water Department actively pursued and was awarded a Source Water Protection Grant to further their protection efforts in the Leyden Reservoir watershed.

Please refer to the attached maps to review land uses in the protection areas.

Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Key Land Uses and Protection Issues include:

1. Nonconforming Activities in Zone I - 400 foot radius around wells
2. Activities in Zone A/Emergency Planning Zone
3. Residential land uses
4. Transportation corridors
5. Hazardous materials storage and use
6. Agricultural activities
7. Comprehensive wellhead protection planning
8. Railroad Right-of-way

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming activities in the Zone I** – The Zone I is a 400 foot radial area around each wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through some other mechanism such as a conservation restriction. Only water supply

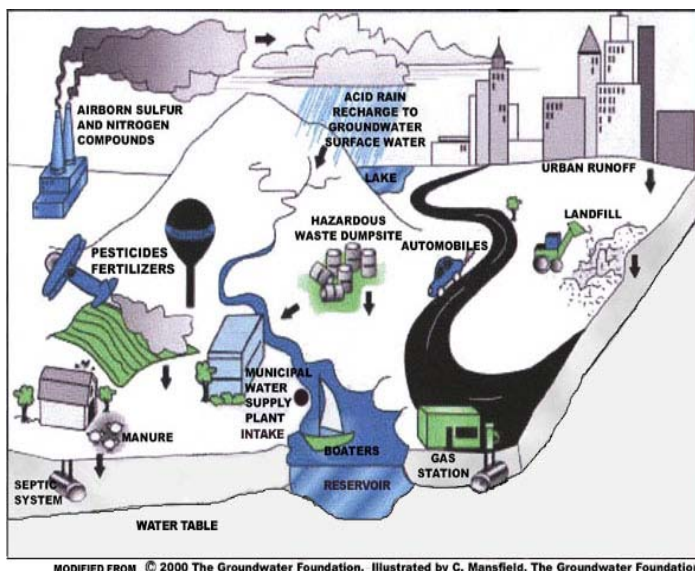


Figure 1: Sample watershed with examples of potential sources of contamination

activities are allowed in the Zone I. Many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes, utilities and public roads. There are local roads, a railroad track and part of a farm within the Zone I of the wells. However, with the exception of the railroad, the City of Greenfield owns or controls through Conservation Restrictions most of the Zone I. In addition, approximately 50% of the Zone II is protected from further development.

#### Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Continue to enforce the conditions of the Conservation Restriction to not use or store

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Uses in the Zone II and Watersheds**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Protection Area	Potential Contaminant Sources*
<b>Agricultural</b>				
Dairy Farms	2	M	Watershed 01S, Zone II	Manure (microbial contaminants): improper handling City has a AR on farm in Zone I and II
Fertilizer Storage or Use	5 ±	M	All	Fertilizers: leaks, spills, improper handling, or over-application. City has a AR on farm in Zone I and II
Forestry Operation	5 ±	L	Watershed 01S, 03S	Erosion, equipment maintenance materials: leaks, spills, or improper handling; road building
Livestock Operations (commercial and recreation)	5 ±	M	All	Manure (microbial contaminants): improper handling City has a AR on farm in Zone I and II
Manure Storage or Spreading	5 ±	H	All	Manure (microbial contaminants): improper handling. City has a AR on farm in Zone I and II
Pesticide Storage or Use	5 ±	H	All	Pesticides: leaks, spills, improper handling, or over-application. City has a AR on farm in Zone I and II
<b>Commercial</b>				
Service Stations/ Auto Repair Shops	1	H	Zone II	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	1	M	Watershed 01S	Application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Course (Driving range)	1	M	Zone II	Fertilizers or pesticides: over-application or improper handling (Driving Range)
Junk Yard	1	H	Watershed 01S	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling (Private Farm)
Railroad Tracks	1	H	Zone II	Transported chemicals, and maintenance chemicals: leaks or spills—Tracks are marked as watershed protection area
Repair Shops (Sales and Service)	1	H	Zone II	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage

Land Uses	Quantity	Threat	Protection Area	Potential Contaminant Sources*
<b>Industrial</b>				
Steel Fabricator	1	H	Zone II	Solvents and other chemicals: spills, leaks, or improper handling or storage
<b>Residential</b>				
Fuel Oil Storage (at residences)	15 +	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	15 +	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	15 +	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aboveground Storage Tanks	15 +	M	All	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Periodic	L	All	Microbial contaminants; wildlife managed by PWS
Road and Maintenance Depots	1	M	Watershed 01S Zone II	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
School	1	M	Watershed 01S	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: <u>Electric</u>	1	L	Watersheds 01S, 03S	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	Numerous	H/M	All	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	2	L	All	Chemicals and other materials including PCBs: spills, leaks, or improper handling (Newer – do not contain PCBs)
Very Small Quantity Hazardous Waste Generator	2	L	Watershed 01S Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ pesticides, fertilizers or deicing materials within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Continue in your historical and current efforts to acquire and protect land within the Zone A and Emergency Planning Zone in the water supply protection areas.
- ✓ Continue your vigilance and communication with the railroad.

**2. Activities in Zone A of the reservoir—** A Zone A for a reservoir includes all areas within 400 feet of the reservoir shore line and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Emergency Planning Zone is a 400 foot setback on either side of river and all tributaries to a Class B river intake. Land use activities within a Zone A or Emergency Planning Zone may have an impact on surface water sources. Wild animals, farm animal and domestic pet wastes can carry waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. while septic systems and road runoff can carry these as well as other contaminants. The City owns the land immediately around the reservoir and the Green River intake and monitors activities within both watersheds. There are roadways and it is assumed that there are a few residential septic systems within the Zone A and the Emergency Planning Zone of the reservoir and intake.

**Zone A Recommendations:**

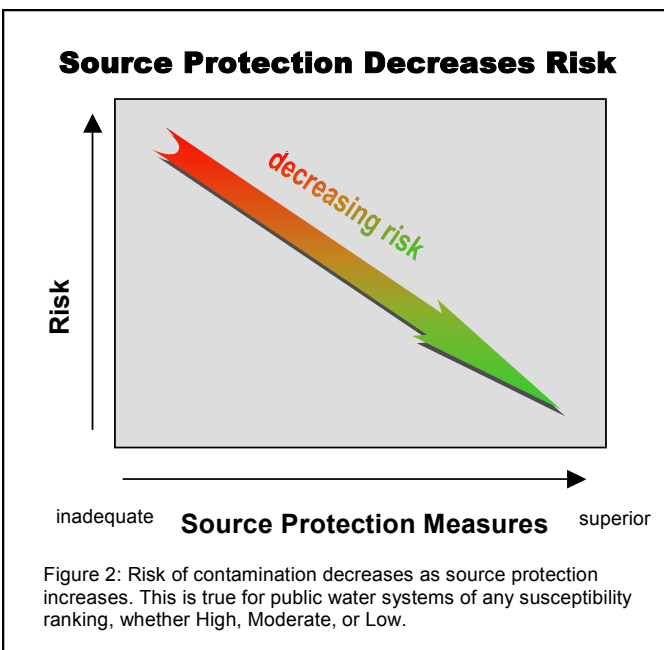
- ✓ Continue your efforts to protect these areas and to monitor and review activities within the Zone A and Emergency Planning Zone for the Green River source.

**3. Residential Land Uses –** Residential areas make up approximately 5% of the Zone II, 4% of the Leyden Glen Reservoir watershed and 3% of the Green River source watershed. There are no municipal sewers and therefore all areas utilize septic systems for sanitary waste disposal. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater

**Top 5 Reasons to  
Develop a Local Wellhead  
and Surface Water  
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants

from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Make available the fact sheet your department has prepared and other appropriate fact sheets available from the MA DEP which can be found at [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues. Extend education efforts into Leyden and Colrain.
- ✓ Work with Planning Boards and Boards of Health to manage new residential developments in the water supply protection areas and to inform the boards of the resource areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** – Interstate 91 and Routes 5 and 10 run through the eastern edge of the Zone II. Local roads are common throughout the Zone II and watersheds of the Leyden Glen Reservoir and the Green River Intake. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins. The steep topography of the watersheds results in application of de-icing materials to protect public health and safety by keeping the roads passable.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II and watersheds.
- ✓ Work with the Towns and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Communicate with local emergency response teams to ensure they are aware of your water supplies and that any spills within the watersheds and Zone II are effectively contained and that the Water Department is notified.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=equip&ct=NRCS>. Contact your local NRCS office to find out more about this funding program.

**4. Hazardous Materials Storage and Use** – Approximately 5% of the land area within the Zone II is commercial or industrial land uses. Although the map for Green River source indicates an industrial use, the facility identified is the shooting range noted previously. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground. Please see Appendix B for a list of businesses within the protection areas known to generate hazardous wastes or use USTs.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Continue working with local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Work with the municipalities of Bernardston, Leyden and Colrain regarding Massachusetts floor drain

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.



requirements and hazardous materials handling. See brochure “Industrial Floor Drains” for more information. See <http://www.state.ma.us/dep/brp/dws/protect.htm> for information regarding handling and management of hazardous materials.

- ✓ The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>

**5. Agricultural Activities** – Cropland and pasture encompass greater than 50% of the total Zone II land area. This includes hay and corn fields, beef cattle farm, pasture lands, and a small horse farm. Agricultural activity encompasses 22% and 8% of the total land uses in the watersheds of the reservoir and Green River sources, respectively. Pesticides, fertilizers and farm equipment petroleum products have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Continue your current work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Continue your current work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.
- ✓ The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**For More Information**

Contact Catherine V. Skiba of the DEP's Springfield Office at 413-755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and the town/City boards.

Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

**6. Protection Planning** – The Town of Greenfield has adopted zoning by-laws/ordinances to protect areas around the Millbrook Wells. However, Greenfield's other water supplies and the northern reach of the Zone II are not within Greenfield.

Planning protects drinking water by managing the land area that supplies water to a well or surface water source. Greenfield Water Department communicates and works with the watershed host communities to protect the water supplies. Bernardston would benefit from extending their protection to their own wells' Zone II and to Greenfield's Zone II.

A Wellhead and Watershed Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public education and outreach. The development of a successful Protection Plan is outlined in five steps in DEP's “Developing a Local Wellhead Protection Plan” and in “Developing a Local Watershed Protection Plan” (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Protection Areas
- Identify potential sources of contamination
- Protect and manage the protection areas
- Conduct ongoing public education and outreach



Although Greenfield has the majority of the components for a Wellhead and Watershed Protection Plans in place, they do not have a formal plan. Greenfield is currently pursuing the development of a plan and has applied for grant funds to complete the plans.

Compile the information supplied in the Zone II reports, this and other reports; include copies of maps outlining the Zone II and detail the protection measures in place. Outline a plan to complete any components of the plan not in place with a timeline for completion. Submit your written report to the DEP Regional office and/or Boston office for approval. This process should be duplicated for the surface water sources, or combined together for one protection plan incorporating protection measures for the surface water protection zones. Continue your current efforts of including the host communities in the planning process and the pursuit of protective by-laws in the towns of Bernardston, Leyden, Colrain and in Vermont.

**Protection Planning Recommendations:**

- ✓ Formalize the Wellhead Protection Plan and create a separate Watershed Protection Plan, or make one plan outlining protection measures for all sources. Refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan" and "Developing a Local Watershed Protection Plan" (see Appendix A).
- ✓ Continue to work with Bernardston, Colrain and Leyden to adopt protective by-laws and regulations for your protection areas extending into their communities. The Department will be instrumental in assisting Greenfield in this effort.

**7. Railroad Right-of-Way** – The railroad transects the Zone I and Zone II of the wells. Rail corridors that serve passenger and/or freight trains are a potential source of contamination due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of a railroad right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. Leaks or spills of transported chemicals or train/track maintenance chemicals are also potential sources of contamination to the water supply.

**Railroad Right of Way Recommendations:**

- ✓ Continue reviewing the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses.
- ✓ Work with local fire departments to review emergency response plans. Updates to this plan should include the railroad rights-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

As with many water supply protection areas, the system's Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Implementing a hazardous waste collection plan in its watershed host community
- Proactive policy to acquire land within the protection areas
- Developing a good working relationship with the communities

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I/A and Emergency Planning Zone regularly; when feasible, remove any non-water supply activities.

- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams in Bernardston, Leyden, Colrain and Greenfield to ensure that they are aware of the stormwater drainage in your Zone II and watersheds to facilitate cooperation and awareness in responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### ➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### ➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

#### ➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

#### ➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, include adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning by laws that prohibit or control potential sources of contamination within the protection areas.

#### ➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination

and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II and watersheds. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I/Zone A?	<b>NO</b>	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Investigate purchasing, or obtaining Right of First Refusal of the remaining Zone A land.
Is the Zone I/Zone A posted with “Public Drinking Water Supply” Signs?	<b>NO</b>	Use “No Trespassing” signs only. Economical signs are available from the Northeast Rural Water Association: (802) 660-4988.
Is the Zone I/Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply related activities the only activities within the Zone I/Zone A?	<b>NO</b>	Continue monitoring non-water supply activities in Zone I/A.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Water Supply Protection Controls that meet 310 CMR 22.21(2) or 310 CMR 22.20 C?	<b>SOME</b>	The Town of Greenfield has Zoning Bylaws that meet 310 CMR 22.21(2), but do not meet 310 CMR 22.20 C. Bernardston, Leyden and Colrain do not. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations.
Do neighboring communities protect the areas of the watershed extending into their communities?	<b>NO</b>	Continue working with neighboring municipalities to include surface water protection areas in their water supply protection controls. Encourage these communities to protect these resources. The Department may be of assistance.
<b>Planning</b>		
Does the PWS have Local Source Water Protection Plans (Wellhead and Surface Water)?	<b>SOME</b>	Follow “Developing a Local Wellhead Protection Plan” and other guidance available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> to create a formal, written plan. Submit up-to-date plan to DEP for approval.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment and update plan by developing a joint emergency response plan with fire department, Board of Health, DPW, departments of surrounding communities, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a water supply protection committee?	<b>NO</b>	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>SOME</b>	Continue working with host communities.
Does the PWS provide water supply protection education?	<b>YES</b>	Aim education at schools, commercial, and municipal uses within the watershed. Extend these education practices into the host communities of the surface water supplies.

## APPENDIX B: REGULATED FACILITIES WITHIN OR IMMEDIATELY ADJACENT TO WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Repair garage *		Leyden	Generator Of Hazardous Waste		Auto Repair
	Highway DPW *		Leyden	Generator Of Hazardous Waste		DPW
	Barton's Garage	Brattleboro Road	Leyden	Generator Of Hazardous Waste	Very Small Quantity Generator	Auto Repair
36641	West Track, Inc.	627 Barton Road	Greenfield	Generator Of Hazardous Waste	Very Small Quantity Generator	Auto – Sales And Service
**Mad985270 537	Barton's Garage	Brattleboro Road	Greenfield	Generator Of Hazardous Waste Oil	Very Small Quantity Generator	Auto Repair

\*\* EPA Identification Number

\* Facility was not registered but had very good hazardous materials management. Registration materials left at facility.

### Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (Gal)	Contents
Indoor Action	1385 Bernardston Road	Greenfield	Sports Center	Unknown	Unknown	1000	Fuel Oil
				Unknown	Unknown	1000	Fuel Oil
				Unknown	Unknown	1000	Fuel Oil
D & S Pump Supply	1203 Bernardston Road	Greenfield	Pump Sales & Service	Unknown	Unknown	1000	Fuel Oil

Merriam Graves	1159 Bernardston Road	Greenfield	Welding Supplies	Unknown	Unknown	10000	Fuel Oil
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For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies, as well as those noted during assessments by the water supplier. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Hadley Highway and Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Hadley Highway and Water Department
<i><b>PWS Address</b></i>	P.O. Box 406
<i><b>City/Town</b></i>	Hadley
<i><b>PWS ID Number</b></i>	1117002
<i><b>Local Contact</b></i>	Mr. Michael J. Klimoski
<i><b>Phone Number</b></i>	413-586-2390

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

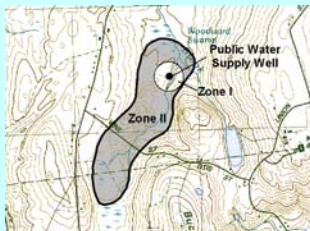
Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

### Table 2 Water Supply Protection Area

Mount Warner Well #1	1117002-01G
Mount Warner Well #2	1117002-02G

Callahan Well #1	1117002-03G
Callahan Well #2	1117002-04G

Hadley is an agricultural and growing, rural residential community in western Massachusetts. Hadley Highway and Water Department maintains four wells for the town's drinking water supply: Mount Warner Wells #1 and #2 (1117002-01G, and 1117002-02G, Zone II #200) and the Callahan Wells #1 and #2 (1117002-03G and 1117002-04G, Zone II #462). The Mount Warner wells are 12-inch diameter gravel developed wells that pump water from a confined aquifer located in the central part of town. The wells have a combined pumping capacity of approximately 1,400 gallons per minute (gpm) and serve as the main supply. Well #1 was installed in 1954 and Well #2 was installed in 1963 at depths of greater than 200 feet. The Callahan wells pump water from an unconfined aquifer south of the Mt. Warner Wells. The Callahan Wells are 16-inch gravel developed wells installed in 1978. Due to the presence of manganese in the water from the Callahan wells, the Callahan wells are used only to supplement the Mt. Warner wells. Each of the Callahan wells has an approved withdrawal rate of 1,050 gpm. Approved withdrawal rates are based on results from extended duration pumping tests. The Zone II for the Callahan wells was delineated through the SWAP program; the Zone II for the Mt. Warner wells was delineated previously by the Town's consultant.

Both wells are located within glacially deepened, bedrock valleys that were buried with sand, gravel and in some areas clay during the recession (melting) of the glaciers some 10,000 before present. Glacial Lake Hitchcock was formed through much of the Connecticut River valley from southern Vermont to central Connecticut. Sediment laden meltwater formed deltas into the lake leaving coarse grained materials at the deltas and along the shoreline. Fine grained deposits were carried to deeper quiescent waters and settled to the lake bottom. Although there is evidence that some portions of the Callahan well aquifer Zone II has a confining clay layer, there is no confining unit in the vicinity of the Callahan wells. The Mt. Warner wells are located within the confined portion of an adjacent aquifer although there is evidence of a delta within the Mt. Warner well Zone II. Both protective areas are considered to be highly vulnerable to contamination because the confined portions of the aquifer are discontinuous and not defined in detail.

Each well has a 400 feet protective Zone I radius. Aquifer parameters were determined from multiple, extended duration pumping tests and the Zone II for the wells was delineated based on conceptual and analytical modeling in

conjunction with geological mapping. Please refer to the attached map to view the boundaries of each Zone II. Water from the Callahan wells and the Mt. Warner Wells is not treated prior to distribution. For current information on water quality monitoring results, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The land uses within the Zone IIs for Hadley Highway and Water Department's wells are a mixture of light industrial, commercial, residential and agricultural areas (refer to attached map for details). Some locations within the protection are served by the Town municipal sewer system while other areas are served by on-site septic disposal. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Tables of Regulated Facilities attached in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Confirmed release sites of hazardous materials or oil
6. Protection Planning
7. Agricultural activities
8. Sewer Pipeline and Wastewater Treatment Facility

Although there are many safeguards on place, the overall susceptibility ranking to contamination of the groundwater supplies is high, based on the presence of numerous high ranking threat land uses within the Zone II water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to control the Zone I through ownership or some other mechanism such as a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. Hadley Highway and Water Department does not own the entire Zone I for any source. The Mt. Warner Zone I has floor drain sump at the pump house and above-ground diesel storage tanks (within secondary containment) for emergency power at the pump house; the Callahan well Zone I has a portion of a state highway within Zone I.

### Zone I Recommendations:

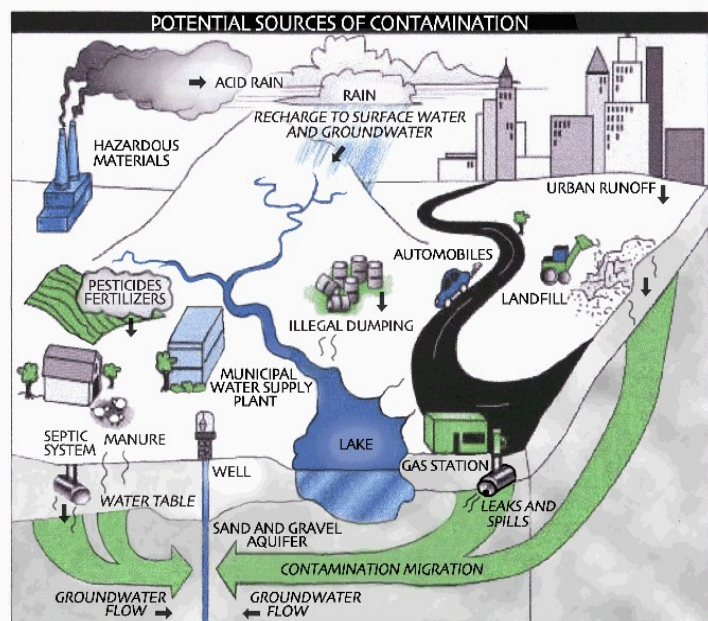
- ✓ Obtain a Right-of-First Refusal for acquiring the land within the Zone I

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- ✓ currently not owned by the Department.
- ✓ Consider purchasing the land or acquiring a conservation restriction on the land to minimize potential threats.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Contact the property owner to be sure they are aware they are within the Zone I and Zone II of the well. Provide information about BMPs.

**2. Residential Land Uses** – Approximately 25% of the Zone II #200 consists of residential areas. The Zone II #462 has about 12% of the land use as residential. Although some of the community is served by municipal sewer, there are several areas, including agricultural and residential areas within the Zone IIs that utilize on-site septic disposal. If managed improperly, activities associated with residential use can contribute to drinking water contamination. Common potential sources of contamination include:



- **Septic Systems** – Improper maintenance and disposal of household hazardous chemicals to septic systems is a potentially a significant source of contamination to the groundwater because septic systems discharge directly to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include petroleum products for automotive and lawn care, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to manage and control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Continue catch basin cleaning routines.

**3. Transportation Corridors** – Both Zone IIs have numerous local roads throughout. State Routes 9 and 47 run through Zone II #462 and Route 116 runs through #200 along the eastern edge. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes and de-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

**Transportation Corridor Recommendations:**

**What are "BMPs?"**

Best Management Practices are structural (i.e. oil & grease trap catch basins), nonstructural (i.e. hazardous waste collection days) or managerial measures that are used to protect and improve surface water and groundwater quality.

- ✓ **Emergency Response** Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ **Low Salt Areas** - Submit a formal request to MA Highway Department to establish Low Salt Areas along Route 9. Hadley maintains Route 47 and should continue to use a moderate sand/salt mixture for ice control on local Hadley roads and monitor water quality. Educate employees and private contractors of the restrictions in designated Low Salt Areas if they are designated.
- ✓ **Planning and Developing** - Be aware of EPA’s Intermodal Surface Transportation Efficiency Act. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 contains provision for the planning and developing of highway systems and transportation enhancement activities,



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Uses and Activities in the Protection Area**

For more information, refer to Appendix 2: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
<b>Agricultural</b>				
Dairy Farms	4	M	462	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	Numerous	M	Both	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	462	Manure (microbial contaminants): improper handling
Landscaping	1	M	462	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Manure Storage or Spreading	Numerous	H	Both	Manure (microbial contaminants): improper handling
Nurseries	2	M	462	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	Numerous	H	200	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Cemeteries	3	M	200	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	H	462	Solvents and wastes: spills, leaks, or improper handling
Medical Facilities	4	M	462	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Paint Shops	1	H	462	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Printer Shops	1	M	462	Printing inks and chemicals: spills, leaks, or improper handling or storage
Office Research Laboratories	1	M	200	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Sand And Gravel Mining/Washing	1	M	200	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aboveground Storage Tanks	Numerous	M	Both	Materials stored in tanks: spills, leaks, or improper handling
Clandestine Dumping	1	H	462	Debris containing hazardous materials or wastes
NPDES Locations	1	L	462	Hazardous material and wastes: improper disposal
Oil or Hazardous Material Sites	2	--	462	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character.
Pipeline (Sewer)	1	M	462	Oil or sewage: spills or leaks
Road Maintenance Depots	2	M	462	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper
Schools	1	M	462	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste	Numerous	M	Both	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper
Underground Storage Tanks	6	H	462	Stored materials: spills, leaks, or improper handling
Wastewater Treatment Plant/Collection	1	M	462	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater:



**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

including the mitigation of water pollution due to highway runoff. Through ISTEA, states are able to use a portion of their federal funding allotment for runoff pollution control devices and other BMPs to prevent polluted runoff from reaching their lakes, rivers, and bays. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

**Stormwater Catch Basins – Recommendations:**

- ✓ **Mapping** - If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to prioritize and investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ **Inspect, Maintain, and Clean** - Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in runoff. Note: Catch basin cleanings are classified as solid waste by DEP and must be handled and disposed in accordance with all regulations, policies, and guidance. In the absence of written approval from DEP, catch basin cleanings must be taken to a facility permitted by DEP to accept solid waste. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity see: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ **Best Management Practices** - Work with the Town to develop Best Management Practices that are the most effective, practical means of preventing or reducing pollution from nonpoint sources. Information is available at <http://www.epa.gov/OWOW/NPS/roads.html>.
- ✓ **Local Controls** - Encourage local officials to develop a local stormwater ordinance. For more information see <http://www.epa.gov/owow/nps/ordinance/stormwater.htm>.
- ✓ **Storm Drain Stenciling Program** - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ **Wellhead Protection Grants** - Continue working towards applying for a Wellhead Protection Grant from DEP for the purpose of addressing stormwater drainage in the Zone II, and for working with the Town to address the "Phase II Stormwater Regulations".

**4. Hazardous Materials Storage and Use** – Commercial or industrial land uses make up about 4% of the entire #462 Zone II, and less than 1% of the #200 Zone II. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Work with the local Board of Health to educate local businesses on Massachusetts' floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II #462 contains two open-ended DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0010026, and 1-0014233. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

**6. Protection Planning** – The town is currently working on a protection plan. Hadley has many of the components for completion of the plan. Hadley does have an Aquifer Protection By-law Review Committee that has proposed and presented revisions to the protective by-law for approval at Town Meeting. Protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The development of a successful Wellhead Protection Plan is outlined in five steps in DEP's "Developing a Local Wellhead Protection Plan" (see Appendix A for the full report) as:

- Maintain a protection committee or team
- Define the Wellhead Protection Area
- Identify potential sources of contamination
- Protect and manage the wellhead protection area
- Conduct ongoing public education and outreach

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

The Town does have an Aquifer Protection District Bylaw, adopted in 1985 and revised in 2001. The by-law substantially complies with water supply protection control regulations 310 CMR 22.21(2) with a few exceptions to the older sections of the by-law.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Maintain a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to periodically review and compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>. Submit current by-laws to the MA DEP for review for compliance.
- ✓ If local Board of Health regulations do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**7. Agricultural Activities** – Crop and pasture lands make up the largest land use percentage of each Zone II: 48% of #200 and 54% of #462. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. Improper

management of hazardous materials also pose a potential threat to the groundwater. In some instances, farmers have on-site irrigation wells or use town water for animals or crops.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Where appropriate, ensure farmers use back-flow prevention devices for connections to public water supplies but also for on-site wells. Inform farmers of BMPs for sanitary seals and back flow prevention for any on-site wells.
- ✓ Work with hobby farmers to ensure that they also are aware of the necessity of back flow prevention for any on-site wells and water use. Offer information about BMPs from NRCS, MA Department of Food and Agriculture and the MA DEP web site.

**8. Sewer pipelines and Wastewater Treatment Plant** – The Zone II contains the Hadley Wastewater Treatment Plant that discharges into the Connecticut River as well as gravity and force mains. Activities associated with wastewater transmission and treatment involve sewage leaks and the storage and use of hazardous materials such as treatment chemicals, chlorine and fuel. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Spills, leaks or mismanagement of wastewater, hazardous materials and stormwater at the plant is a potential source of contamination.

**Wastewater Treatment Plant Recommendations:**

- ✓ Ensure wastewater treatment facility is operated, upgraded and maintained according to DEP requirements.
- ✓ Work to have stormwater drains and the drainage system around the wastewater treatment plant mapped.
- ✓ Work with plant to be sure that best management practices are used for proper handling of materials and in containing spills and leaks.
- ✓ Work with plant to be sure emergency planning includes notification for Hadley Highway and Water Department.
- ✓ Ensure that the plant's underground storage tank has monitoring and is maintained properly.

Other land uses and activities within the Zone II that have potential for contamination include auto repair shops, gas stations, plant nurseries, and medical facilities. Refer to Table 2 and Appendix 2 for more information about these land uses.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

Although the Zone II contains numerous existing and potential sources of contamination, awareness and source

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

protection measures reduces the risk of actual contamination, as illustrated in Figure 2. Identifying additional potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watersheds when responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling,

- ✓ and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Communicate with owners/operators of the rights-of-way to ensure Best Management Practices are being used
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

#### **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

#### **Plan for the Future:**

One State and of the most effective means of protecting water supplies is planning, local include such as the adoption of local controls to protect land use regulations related to watersheds and ground water., These controls may include health ordinances/regulations, no discharge prohibitions general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. These recommendations are only part of your ongoing local drinking water source protection.

#### **Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR). Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

#### **Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>Partially</b>	The Town's "Aquifer Protection District" bylaw has recently been updated and substantially meets DEP's best efforts for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations for any future updates. Submit by-laws for review
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with neighboring municipality Amherst to include portions of the Zone III along the Fort River in their well-head protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. And inform ER teams of the location of the Zone IIs.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Encourage the continuation of the committee and include modification and improvement of existing by-laws as appropriate.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

## APPENDIX B:

### REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

#### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
30533	Allards Farms, Inc.	41 S. Maple Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Farm
				Generator of Hazardous Oil Waste	Small Quantity Generator	Farm
				Handler	Recycling – A	Farm
36688	Valley Starter and Alternator	3 Isabel Court	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Automotive Repair
37540	Jiffy Lube	347 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Automotive Maintenance
				Toxic Waste User	BLW-TU (Below Threshold)	Automotive Maintenance
50407	Montgomery Rose Company, Inc.	350 Russell Street	Hadley	Generator of Hazardous Waste and Waste Oil	Very Small Quantity Generator	Industrial
				Plant	RES Application Approved	Industrial
				DISCH	IWWSC	
				Plant	ASB-AQ	Industrial
50158	Montgomery Rose Company, Inc.	319 River Drive	Hadley	Air Handler	Synthetic Source (SM450)	Industrial



251565	Performance Motoring, Inc.	315 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	
				Generator of Hazardous Waste Oil	Small Quantity Generator	
				Non Permitted Action (Non-Notifier)	Requires change of use or permit	
				Toxic User	BLW-TU	
				EPIC	BLW-SW	
				Plant	BLW-AQ	
284980	Hadley Wastewater Treatment Plant	134 South Middle Street	Hadley	SUROWI	WMSRMN (NPDES Discharge)	Treatment Facility
				Generator of Hazardous Waste	Very Small Quantity Generator	
972	Hadley Municipal Treatment Plant	Town Hall	Hadley	SURFAC	SURMIN	Treatment Facility
*MV4135850889	Charlie's Auto Body	Mill Valley	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Auto Body Repair
*MV4135848976	Dr. Edward M. Nowak	293 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MAV000009171	Dr. Edward Smola	59 East Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MV4135863306	Dr. Mark Klepacki	190 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MAV000009355	Drs. Gold, Moini, and Witzenberger	190 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MAV000018044	Gleason Brothers	50 S Maple Street	Hadley	Generator of Hazardous Waste Oil	Very Small Quantity Generator	

*MAV000002 810	Hadley Family Chiropractor	187 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MV4135595 431	Hampshire College Physical Plant	289 Bay Road	Hadley	Generator of Hazardous Waste and Oil Waste	Very Small Quantity Generator	College
*MAV000009 496	Hampshire Mall Dental Center	Hampshire Mall, Route 9	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
*MV4135493 251	MA/UMASS Hadley Farm	111 N. Maple Street	Hadley	Generator of Hazardous Waste and Waste Oil	Very Small Quantity Generator	Research Farm
*MAV000015 084	Midas Muffler	397 Russell Street	Hadley	Generator of Hazardous Waste and Waste Oil	Very Small Quantity Generator	Auto Repair
*MV4135860 892	Monro Muffler/Brake, Inc.	360 Russell Street	Hadley	Generator of Hazardous Waste Oil	Small Quantity Generator	Auto Repair
*MAV000011 653	New England Auto Sales	251 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Auto Sales
*MV4135867 133	Paint Shack	322 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Paint Shop
*MAV000015 111	Ray's Auto Repair	71 Lawrence Plain Road	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Auto Repair
*MAV000003 668	Redi Rent	301 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Rental Company
*MAV000005 372	Valley Dentists	138 Russell Street	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Medical Facility
**MAR98188 6625	Wal-Mart #2683	337 Russell Road	Hadley	Generator of Hazardous Waste	Very Small Quantity Generator	Discount Retailer

\* Massachusetts Identification Number

\*\*EPA Identification Number

## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Allards Farms, Inc.	41 S Maple Street	Hadley	Farm	2 Wall	Interstitial Space Monitor	10000	Diesel
Kicza Lumber Company, Inc.	303 Russell Street	Hadley	Lumber Yard	1 Wall	Removed?	1000	Diesel
				1 Wall	Removed?	1000	Waste Oil
Montgomery Rose Company	350 Russell Street	Hadley		2 Wall	Interstitial Space Monitor	4000	Diesel
Town of Hadley Highway Department	South Middle Street	Hadley	DPW	2 Wall	Interstitial Space Monitor	10000	Diesel
				2 Wall	Interstitial Space Monitor	10000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0010026	169 Bay Road	Hadley	Oil
1-0014233	25 East Hadley Road	Hadley	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



# Source Water Assessment Program (SWAP) Report for Mary Lyon Nursing Home

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge **areas** of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 8, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Mary Lyon Nursing Home
<i>PWS Address</i>	34 Main Street
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120001
<i>Local Contact</i>	Mr. Nelson Richmond
<i>Phone Number</i>	413-566-5511

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1120001-01G	256	645	High
Well #2	1120001-02G	236	580	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

Mary Lyon Nursing Home is located on Main Street in Hampden. The activities and land uses consist of all facilities associated with a 100-bed nursing home including parking, kitchen, laundry, boiler, maintenance, and hairdressing facilities. The nursing home is also located immediately adjacent to the Scantic River. Hampden does not have municipal water or wastewater systems and therefore the facility is served by two, on-site water supply wells and a septic system for wastewater disposal. Natural gas is utilized for the boilers but there are 2, 275-gallon, AST, diesel fuel tanks for the back-up generator.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Both wells were installed in 1969 and are 6-inch diameter, bedrock wells. Well #1 is located in the courtyard, is approximately 180 feet deep and based on metered data is capable of producing 11,000 gpd. Well #2 is located on the south side of the facility immediately adjacent to the laundry, the generator and an electrical transformer. Well #2, was originally drilled to a depth of 245 feet but in 1986 was over drilled to a total current depth of 420 feet. In 1991, the Department approved a withdrawal rate of 5.6 gpm based on pumping test data. Geologic mapping in the area indicates overburden deposits of up to approximately 30 feet of sand with approximately 50 feet depth of till over bedrock. The facility is located immediately east of the approximate location of the eastern border fault between the sedimentary rocks of the Connecticut River valley and the volcanic and metamorphic rocks of the uplands to the east. The bedrock valley was filled with stratified drift (sand and gravel) during the recession of the glaciers some 12,000 to 18,000 years ago and the nursing home is located at the edge of the valley. Bedrock at the site is mapped as schist of the Erving Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water are allowed to occur or activities that are non-threatening. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The Zone I protective radii for the Wells #1 and #2 are 256 feet and 236 feet, respectively. The IWPA radii are 645 feet and 589 feet, respectively. These protective radii were calculated based on metered water use from Well #1 and an approved withdrawal rate for Well #2. Please refer to the attached map that shows the Zone I and IWPA.

The Zone I area for the well is not conforming to current DEP requirements. The Zone I includes all or part of the nursing home facility including the parking areas and the septic system, an adjacent residence and Main Street. Additional commercial facilities

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Transportation corridors/parking	Yes	Yes	Moderate	Petroleum products, hazardous materials spilled during accidents and stormwater runoff
Landscaping	Yes	Yes	Moderate	Do not use pesticide/fertilizers
Office facilities and parking	Yes	Yes	Moderate	Limit road salt usage. Use BMPs for household hazardous materials. Monitor parking areas
ASTs (diesel for generator)	Yes	Yes	High	Petroleum products – accidental release. Ranking increased to high due to proximity to Well #2 and condition of the tanks.
Nursing home	Yes	Yes	Low	Septic systems and household hazardous materials
Inappropriate discharge to septic (floor drain – boiler room/janitor's closet)	Yes	Yes	-	Comply with UIC regulations
Electrical transformer	Yes	Yes	Moderate	Ranking increased due to proximity to Well #2
Residential land use	Yes	Yes	Moderate	Septic systems and household hazardous materials

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

are included in the IWPA.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer.

The pH of the water is adjusted with potassium carbonate for corrosion control prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the following section, attached map of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I**
2. **Nursing Home**
3. **Floor drains**
4. **Residential housing**
5. **Aboveground storage tank**
6. **Transportation corridor/parking**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the system is high based on the types of activities and the proximity of those activities to the wells.

The Mary Lyon Nursing Home administration is proposing an expansion of the facility and is presently negotiating with the Department regarding strategies to develop a more protected source of water for the facility.

**1. Non-conforming activities within Zone I** – The water supplier does not own or control the entire Zone I area for either well. Systems that do not meet DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership and non-conformance, prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas.
- ✓ Locate a new well and remove as is feasible, non-conforming activities.
- ✓ Replace the diesel generator with a propane generator or replace the tanks and provide containment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all deliveries of hazardous materials.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Nursing Home** - All of the facility is located within the Zone I or IWPA of the well. Potential exists for

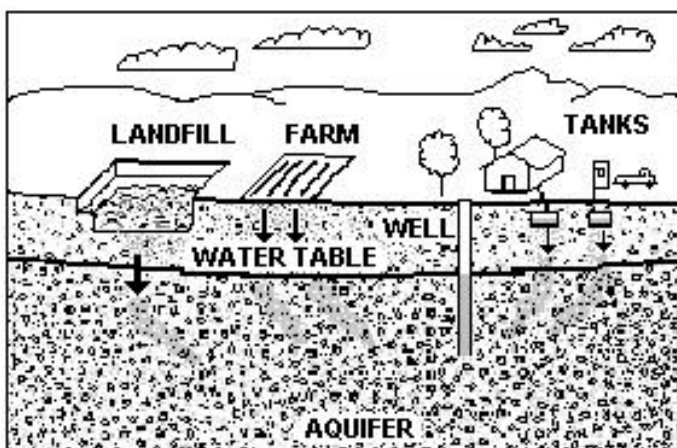


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

contamination of the well by onsite use of cleaning materials, household hazardous materials, fertilizers, and pesticides, all of which can be of concern. The facility should be using applicable BMPs to eliminate any potential non-sanitary waste from the wastewater stream.

#### Recommendations:

- V Use of Best Management Practices for all activities at the facility. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- V Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- V Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- V Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V Monitor roadside and parking areas for spills and leaks. This is particularly important since the storm drains discharge directly to the ground.

**3. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that discharge to a dry well and janitors sinks that discharge to the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials (boiler blowdown) may enter the floor drain. The floor drain must be protected to prevent boiler blowdown or other prohibited discharges through the floor drain.

#### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached). Ensure that that the renovation designs are in compliance.
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- V Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.
- V Install a tight tank for disposal of non-sanitary wastewater.

**4. Residential housing** – Residential development in general poses minimal threat to public and private water supplies provided there is proper management of household hazardous materials and maintenance of septic systems. Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

#### Recommendations:

- V Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems and supply this information to the Town to distribute to residents.
- V Work with the town to promote household hazardous waste collection days.

**5. Aboveground Storage Tank (AST)** – The diesel ASTs are located immediately adjacent to Well #2, are not within containment and appear to be deteriorating. If managed improperly, ASTs can pose a risk of contamination due to leaks or spills of the chemicals they store.

#### Recommendations:

- V Consider replacing the diesel generator with a propane generator.
- V Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

- ✓ Remove or relocate the ASTs from the Zone I, or provide 110% secondary containment for the AST. Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, local regulations and fire code requirements.

**6. Transportation corridor/parking** – Main Street and Wilbraham Road are located within the Zone I and IWPA of the wells. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- ✓ Monitor and manage stormwater from parking areas to protect Well #2.
- ✓ Work with the Town Highway Department to determine the location and discharge points of road runoff as is feasible. If reasonable, discharge stormwater to discharge downgradient of the well.
- ✓ The town should review their eligibility for potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). For more information, call the local office in Hadley at 413-585-1000 or visit the U.S.D.A. web site at [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov). Fact sheets are available online - <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.
- ✓ Prepare an Emergency Response Plan that includes coordination with the town emergency responders in the event of an accident near the wellhead.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination.

Please review and adopt the key recommendations listed above and as follows:

**Zone I and IWPA:**

- ✓ Pursue source replacement.
- ✓ Provide drainage controls around the casing at Well #2 to prevent parking lot runoff from inundating the casing.
- ✓ Remove the dumpster from Zone I.
- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking area away from the well.
- ✓ Prohibit the use of pesticides on the lawns in Zone I.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

**Training and Education:**

- ✓ Maintenance staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Provide information regarding the proper disposal and maintenance of septic systems.

**Facilities Management:**

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Incorporate an Integrated Pest Management (IPM) approach into your pest/lawn management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.

**Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes all public water supply IWPA's and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Hampden Housing Authority

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the **recharge** areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Hampden Housing Authority
<b>PWS Address</b>	26 Springmeadow Road
<b>City/Town</b>	Hampden, Massachusetts
<b>PWS ID Number</b>	1120002
<b>Local Contact</b>	Christine Evans
<b>Phone Number</b>	(413) 566-8157

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well No. 1	1120002-01G	239	587	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for Hampden Housing Authority is located toward the west end of Spring Meadow Road. There are no municipal water or wastewater facilities in Hampden. Therefore, the Hampden Housing Authority is served by one on-site well and on-site septic disposal. The well is a 277-foot deep bedrock well located in the center of the facility.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I radius of 239 feet and an Interim Wellhead Protection Area radius of 587 feet based on metered water use at the facility. The entire facility is located within either the Zone I or the IWPA protection area including septic components, parking, transformers, maintenance shed and all residential facilities.

Geologic mapping in the area indicates overburden deposits of between 50 and 100 feet of sand and gravel. The facility is located in an area mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 12,000 to 18,000 years ago. The bedrock is mapped as the Jurassic Age, sedimentary redbeds of the Connecticut River valley. The eastern valley border fault is east of the facility. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and,**
3. **Building and Grounds Maintenance**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP before expanding or modifying the system.
Driveways, road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	Yes	Yes	Moderate	Conduct proper maintenance and upgrades to fuel oil tanks and lines to prevent releases from occurring. Manage petroleum in the storage shed.
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn Care/Gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

1. **Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related or other non-threatening activities in Zone I. The Zone I contains driveways, roads, parking spaces, a backup diesel generator with storage tank, and residences. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ When upgrading or replacing the backup diesel, convert the generator to propane.
- ✓ If the generator cannot be converted consider relocating it and the diesel tank outside of the Zone I, keeping the tank on an impervious surface with secondary containment to prevent an accidental release or spill from entering the groundwater.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the well.

2. **Residential Land Uses** – The residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - Although Hampden Housing Authority heats by electricity, the other private residences within the northern portion of the IWPA may heat with fuel oil or diesel fuel. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. **Building and Grounds Maintenance** – A storage shed in the IWPA contains a drum of oil for a tractor plus a few five-gallon gasoline containers. Spills or leaks of these petroleum products could potentially impact the aquifer.

### Recommendations:

- ✓ Consider adding a berm along the interior perimeter of the shed to prevent releases of petroleum products from exiting the shed.
- ✓ Provide secondary containment for the gasoline containers and the oil drum.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

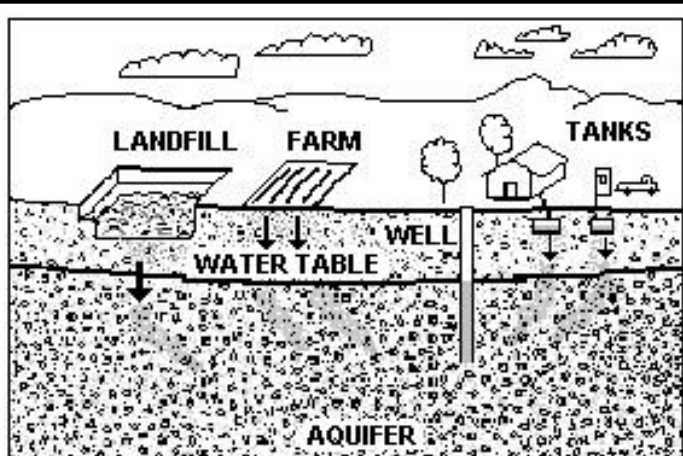


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### **For More Information:**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Hampden Housing Authority is commended for raising the elevation of the casing above grade. Hampden Housing Authority should review and adopt the key recommendations above and the following:

#### **Priority Recommendations:**

- ✓ If possible relocate septic system tanks outside of the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the wells.

#### **Zone I:**

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

#### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

#### **Facilities Management:**

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm. Consider long term plans to raise the transformers above ground.

#### **Planning:**

- ✓ Work with local town officials to establish an Aquifer Protection District with bylaws and to include the facility's IWPA in the District.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the wells and is treated according to DEP guidance.

#### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection

recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following MA DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Wellhead Protection Grant Program Fact Sheet



# Source Water Assessment Program (SWAP) Report for Thornton Burgess Middle School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 16, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Thornton Burgess Middle School</b>
<i>PWS Address</i>	<b>Wilbraham Road</b>
<i>City/Town</i>	<b>Hampden, Massachusetts</b>
<i>PWS ID Number</i>	<b>1120006</b>
<i>Local Contact</i>	<b>Mr. Michael Framarin</b>
<i>Phone Number</i>	<b>413-525-4879</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1120006-01G	159	455	Moderate
Well #2	1120006-02G	155	452	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Thornton Burgess Middle School (the school) is located in the west-central side of Hampden. The school student and staff population is approximately 350 people per day and the school is served by two potable supply wells (Well #1 and Well #2). Well #1 is located southwest of the school near the tennis court and Well #2 is located near Wilbraham Road northeast of the school. There is no municipal wastewater sewer system in Hampden; therefore, the school and surrounding facilities are served by on-site septic disposal.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The wells both have 6-inch diameter casings however little is known about the wells. Well #2 was installed prior to construction of the school and Well #1 was installed during school construction. Well #1 is a bedrock well and is approximately 380 feet deep; Well #2 is approximately 94 feet deep. Geologic mapping in the area indicates overburden deposits of 85 feet of sand with 14 feet of till over bedrock at the school. It is unclear if Well #2 is in the overburden or in bedrock. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 14,000 to 18,000 years ago. The school is located immediately in the vicinity of the eastern valley border fault that separates the Jurassic sedimentary beds of the Connecticut River valley from the metamorphic (schist) rocks of the eastern highlands. There is some stratified drift along the flank of the hills to the east but only thin till covering on the uplands with numerous bedrock outcrops mapped.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The wells have Zone I protective radii of 159 and 155 feet, respectively and (IWPA) radii of 455 and 452 feet, respectively. These protective radii were calculated based on the metered water use from the two highest months of use. The wells are used alternately to meet school demand. Please refer to the attached map that shows the Zone I and IWPA. The Zone I areas for the wells are not conforming to current DEP requirements. The Zone I area for 01G includes the school boiler room and fuel oil, a residential lot with a home, recreational facilities and components of septic systems; the Zone I for 02G includes Wilbraham Road. The IWPAs include additional residential development and part of a golf course.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Well #1	Both	Moderate	AST w/containment at school
Floor Drains in Boiler Rooms	Well #1	Both	Moderate	Consult with UIC program regarding compliance
Athletic fields	No	Well # 1	Moderate	Continue current practice of prohibiting the use of pesticides/fertilizers on fields
School facilities and parking	Well #1	Both	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
High to medium density residential housing	Well #1	Both	Moderate	Septic systems, household hazardous materials, home heating fuel
Transportation Corridor	Well #2	Both	Moderate	Wilbraham Road
Septic systems components	Both	Both	Moderate	School leachfield in the IWPA, force main in Zone I – Well #1
Golf Course	No	Both	Moderate	Pesticides and hazardous materials from equipment used on course. Golf course has an Integrated Pest Management plan.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information. Please note that the land use descriptions are limited and the school area is described as Urban Open space for lack of a better descriptor.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Floor drains in boiler rooms;**
3. **School facilities and athletic fields;**
4. **Residential housing; and**
5. **Golf course.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate based on several moderate threat activities within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area for either well. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I for Well #2 extends across a

public road and includes the school and part of one home.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all fuel oil deliveries.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Aboveground fuel oil storage tank** – A fuel oil AST is located within the Zone I of Well #1. It is in the building and within containment. The school has a backup generator that is fueled by propane. If managed improperly, fuel oil tanks and the fuel lines can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local

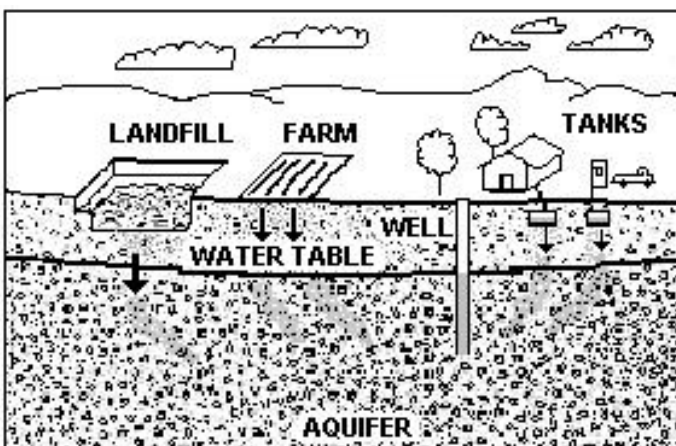


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

fire department for any additional local code requirements regarding ASTs.

- ✓ Monitor all activities associated with the fuel oil, especially delivery.
- ✓ Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room.

**2. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

#### Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - ◆ Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**3. School facilities and athletic fields** - Middle schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some if the activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the Zone I or IWPA of the wells. Potential exists for contamination of the well by onsite use of fertilizers or pesticides. Storm drains in the parking areas at the school drain directly into the ground.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**4. Residential Land Use** – There are several residences within the IWPA protection areas and one partially within the Zone I of Well #2. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic



disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**5. Golf Course** – The Hampden Country Club is located adjacent to the school. The club is a PWS and has a water withdrawal permit under the Water Management Act. The club has submitted a plan for Integrated Pest Management and the Department of Agricultural Resources regulates the use of pesticides.

- ✓ Encourage golf course managers to utilize the Integrated Pest Management (IPM) approach. IPM is an ecologically based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the current protection practice of not using pesticides and fertilizers in the Zone I. The school district should comment to the various town boards regarding developments that may impact the school’s wells. As an example, the subdivision built partially within the Zone I of Well #2 may have been modified to be more protective.

Please review and adopt the key recommendations listed above and as follows:

#### **Priority Recommendations:**

- ✓ Communication with the Town boards regarding the location of the wells and the protection areas.
- ✓ Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room.

#### **Zone I and IWPA:**

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider relocating the wells.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the wells themselves.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

#### **Training and Education:**

- ✓ Incorporate groundwater education into the school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.

#### **Facilities Management:**

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the

school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.

**Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the wells' IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain
- Very Small Quantity Generator (VSQG) information



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Green Meadow School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
October 28, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Green Meadow School</b>
<i>PWS Address</i>	<b>North Road</b>
<i>City/Town</i>	<b>Hampden, Massachusetts</b>
<i>PWS ID Number</i>	<b>1120011</b>
<i>Local Contact</i>	<b>Mr. Michael Framarin</b>
<i>Phone Number</i>	<b>413-525-4879</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1120011-01G	100	418	Moderate
Well #2 (Proposed)	1120011-02A	--	--	--

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Green Meadow School (the school) is located in central Hampden. The school student and staff population is approximately 400 people per day and is served by a single potable supply well (Well #1). Currently the school is undergoing a renovation and expansion. As part of that project, a new well, (Well #2) is being developed. The well is being permitted through the New Source Approval process. Once that well is approved and added to the system, this report will be updated to include Well #2.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 was installed at the time of the original construction of the school and is located in a pit, immediately adjacent to (east of) the school. There is no municipal wastewater sewer system in Hampden; therefore, the school and surrounding facilities are served by on-site septic disposal. Well #1 is a bedrock well with a 6-inch diameter casing and is approximately 95 feet deep. The school is located east of the valley border fault that separates the Jurassic sedimentary beds of the Connecticut River valley from the metamorphic (schist) rocks of the eastern highlands. The geologic map for the area identifies the bedrock at the school site as the Ammonoosac Volcanics, an amphibolite – gneiss.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 100 feet and an IWPA radius of 418 feet. These protective radii were calculated based on the metered water use from the two highest months of water use. Please refer to the attached map that shows the Zone I and IWPA. The Zone I area for Well #1 is not conforming to current DEP requirements. The Zone I area for 01-G includes the school, the boiler room and fuel oil, a storm drain, the dumpster and some school parking. The IWPA includes the entire school including the septic system and leachfield, the ball fields and parking.

The school is located in an area of faulted and folded bedrock uplands. The surficial maps indicate thin till deposits overlying the upland bedrock. There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Yes	Yes	Moderate	AST w/containment at school
Floor Drains in Boiler Rooms	Yes	Yes	Moderate	Consult with UIC program regarding compliance. Ensure that the new boiler room has a tight tank.
Athletic fields	Yes	Yes	Moderate	Continue current practice of prohibiting the use of pesticides/fertilizers on fields
School facilities and parking	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Septic systems components	Yes	Yes	Moderate	School leachfield in the IWPA

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brn/dws/](http://www.state.ma.us/dep/brn/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Aboveground fuel oil tank;**
3. **Floor drains in boiler room;**
4. **School facilities and athletic fields; and**
5. **Residential housing**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate. Please refer to Table 2. The school is commended for its proactive approach to source protection by applying for and being awarded a Wellhead Protection Grant to address source protection issues for Well #1. Additional source protection measures will be undertaken as part of the school renovations including the development of a new well.

**1. Non-conforming Zone I** – The water supplier owns the entire Zone I area. However, there are numerous activities in the Zone I that are not allowed. DEP requires that only water supply related activities or non-threatening activities occur within Zone I. Systems not meeting DEP Zone I requirements, must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. The school is in the process of developing a new well as part of a school expansion.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Monitor all fuel oil deliveries.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Aboveground fuel oil storage tank** – A fuel oil AST is located within the Zone I. It is in the building and within containment. The school uses propane and has kept the oil tank as an emergency backup. If managed improperly, fuel oil tanks can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.

**3. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that discharge to the stormdrain system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials (boiler blow down) or petroleum may enter the floor drain. The floor drain must be

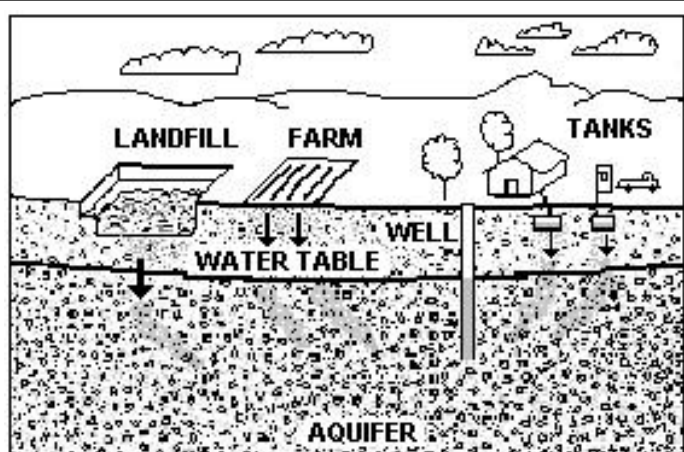


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. The floor drains for the new boiler will be directed to a tight tank.

### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached). Ensure that the renovation designs are in compliance.
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- V Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**4. School facilities and athletic fields** – Elementary schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers or pesticides. Stormdrains in the parking areas at the school drain directly into the ground.

### Recommendations:

- V Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- V Investigate Integrated Pest Management and Best Management Practices within the IWPA, as necessary.
- V Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- V Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V Refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information.

**5. Residential Land Use** – There are a few residences on the edge of the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants

include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.



### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The DEP commends the practice of not using pesticides and fertilizers in the Zone I and having a propane backup generator. The school district should comment to the various town boards regarding developments that may impact the well.

Please review and adopt the key recommendations listed above and as follows:

#### **Priority Recommendations:**

- ✓ Communication with the Town boards regarding the location of the well and the protection areas.
- ✓ Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room and ensure that the school renovation designs include a tight tank for the boiler room.

#### **Zone I and IWPA:**

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider relocating the well.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

#### **Training/Education and Facilities Management:**

- ✓ Incorporate groundwater education into the school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.

#### **Planning:**

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- ✓ Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- UIC/Industrial Floor Drain



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For White Birch Garden

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 15, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	White Birch Garden
<i>PWS Address</i>	359 Main Street
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120015
<i>Local Contact</i>	Robert Bergmann
<i>Phone Number</i>	(413) 598-8899

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well No. 1	1120015-01G	151	449	Moderate
Well No. 2	1120015-02G	151	449	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

White Birch Gardens are an apartment complex located in central Hampden. The wells for White Birch Garden are located north of Main Street and the facilities main buildings. Hampden does not have a municipal wastewater sewer system or a municipal water system. Therefore, the apartments are served by on-site septic disposal and two wells. Well No.1 and Well No. 2 were installed at the time of the original construction. Well No. 2 was recently, successfully hydrofractured to increase the yield. Both well are located north of and immediately adjacent to the buildings. Well #1 is a bedrock

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

well with a 6-inch diameter casing and is greater than 450 feet deep. Well #2 is also a 6-inch diameter well that is greater than 330 feet deep.

The apartments area located east of the valley border fault that separates the Jurassic sedimentary beds of the Connecticut River valley from the metamorphic (schist) rocks of the eastern highlands. The bedrock is mapped as a schist of the Erving Formation. Geologic mapping also indicates sand and gravel deposits in the immediate vicinity less than 50 feet deep. The sand and gravel is likely glacially outwash deposits that have been reworked and had recent alluvium deposited along the river valley.

The wells have Zone I radii of 151 feet and Interim Wellhead Protection Area radii of 449 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPAs. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses; and,**
3. **Roads**

The overall ranking of susceptibility to contamination for the wells is moderate, based on

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveways/road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn Care/Gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Stormwater Drains/Retention Basins	Yes	Yes	Low	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

the presence of at least one moderate threat land use or activity in the Zone Is and IWPAs, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities or non-threatening activities in Zone Is. The wells' Zone Is contains floor drains, driveways, parking spaces, and residences. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the wells.
- ✓ If possible relocate septic systems outside of the Zone I.

**2. Residential Land Uses** - The residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in

Appendix A and on the MA DEP website page [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Roads** - Major roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact local fire department to ensure that the IWPAs are included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to

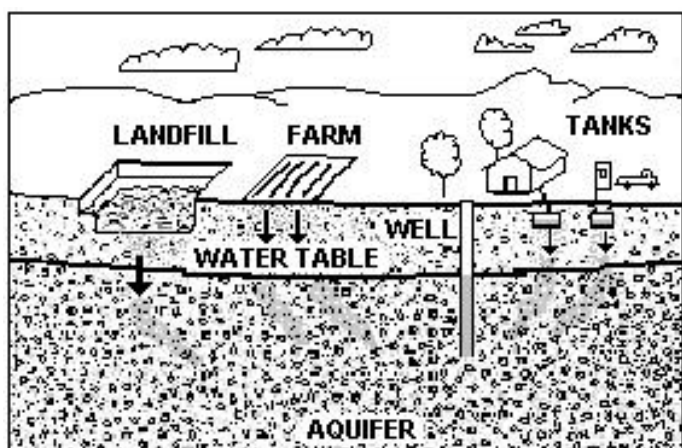


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

contamination. White Birch Garden is commended for raising the elevation of the wellheads, posting signs in the Zone I, and educating tenants on wellhead protection issues. White Birch Garden should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Develop an updated Emergency Response Plan and submit a copy to the DEP.
- ✓ Relocate septic systems outside of the Zone I, as is feasible.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the wells.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Continue to protect the wellheads from damage.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in town to include the facility's IWPA's in Aquifer Protection District Bylaws if the town establishes such bylaws in the future.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the wells and is treated according to DEP guidance.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding

opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the MA DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure





# Massachusetts Department of Environmental Protection

## Source Water Assessment Program (SWAP) Report

### for

## 2 Allen Street Professional Building

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
November 5, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>2 Allen Street Professional Building</b>
<i>PWS Address</i>	<b>2 Allen Street</b>
<i>City/Town</i>	<b>Hampden, Massachusetts</b>
<i>PWS ID Number</i>	<b>1120022</b>
<i>Local Contact</i>	<b>Mr. Karnig Zeroogian</b>
<i>Phone Number</i>	<b>413-566-3097</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1120022-01G	142	442	Moderate

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

The 2 Allen Street Professional Building is located on the corner of Allen Street and Wilbraham Road in Hampden. The facility consists of two separate buildings that house professional offices and a day care center. The system is served by single, 6-inch diameter bedrock well drilled to approximately 199 feet with an estimated yield of approximately 7 gallons per minute (gpm). The facility on average uses approximately 1,630 gpm. Geologic mapping in the area indicates overburden deposits of 85 feet of sand with 14 feet of till over bedrock at the school. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

glaciers some 12,000 to 18,000 years ago. The facility is located in an area where the bedrock is mapped as the Jurassic Age, sedimentary redbeds of the Connecticut River valley.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 142 and an IWPA radius of 418 feet. These protective radii were calculated using an estimate of water use based on Title 5 usage estimates of 1,900 gallons per day. Current metered water use data indicate maximum usage is approximately 1,700 gpd. Please refer to the attached map that shows the Zone I and IWPA.

The Zone I area for the well is not conforming to current DEP requirements. The Zone I includes the all or part of two office buildings and associated parking, Wilbraham Road, a residential property and the facility septic system including the leaching pits. The facility is heated with natural gas. Additional office buildings, residential and commercial uses are included in the IWPA.

The surficial maps indicate a relatively thick (>40 feet) sequence of sand and gravel deposits in the valley where the facility is located and there is no evidence of a continuous, protective confining clay layer in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached map of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	--	--	--	Contact DEP before expanding or modifying your system.
Transportation corridors	Yes	Yes	Moderate	Petroleum products, hazardous materials spilled during accidents and stormwater runoff.
Landscaping	Yes	Yes	Moderate	Do not use pesticide or fertilizers.
Office facilities and parking	Yes	Yes	Moderate	Limit road salt usage use BMPs for household hazardous materials. Monitor parking areas.
Medium density residential housing	Yes	Yes	Moderate	Septic systems and household hazardous materials.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Office facilities,**
3. **Residential housing, and**
4. **Transportation corridor.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area for either well. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I extends across a public road and includes one of the office buildings.

### Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Inspect the well regularly to ensure integrity of the cap and the sanitary seal. Inspect drainage around the well at the same time.

**2. Office facilities** - Generally day care and office facilities use only household hazardous materials for cleaning. All of the facility is located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers or pesticides. The dentist office should be using BMP applicable to that profession to eliminate any potential non-sanitary waste from the wastewater stream.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the facility. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use or store pesticides, fertilizers or deicing materials within Zone I.

- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Monitor roadside and parking areas for spills and leaks. This is particularly important since the storm drains discharge directly to the ground.
- ✓ Ensure that the dentist is using BMPs to manage wastewater appropriately.

**3. Residential housing** – Residential development in general poses minimal threat to public and private water supplies provided there is proper management of household hazardous materials and maintenance of septic systems. Septic systems are located within the Zone I and IWPA of the well. If a septic system fails or is not properly maintained it could be a potential

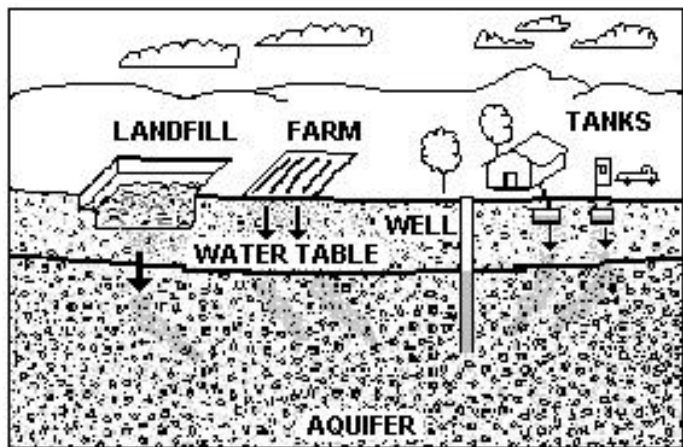


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### Facilities Management:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator

### Planning:

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the well's IWPA and to assist you in

source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems and supply this information to the Town to distribute to residents.
- ✓ Work with the town to promote household hazardous waste collection days.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**4. Transportation corridor** – Allen Street and Wilbraham Road are located within the Zone I and IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

### Recommendations:

- ✓ Work with the Town Highway Department to determine the location and discharge points of road runoff, as is feasible. If reasonable, direct stormwater discharge downgradient of the well.
- ✓ The town should review their eligibility for potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). For more information, call the local office in Hadley at 413-585-1000 or visit the U.S.D.A. web site at [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov). Fact sheets are available online - <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Prepare an Emergency Response Plan that includes coordination with the town emergency responders in the event of an accident near the wellhead.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Monitor activities and if there is evidence of increased activity or access.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking area away from the well.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.
- ✓ Request that the dentist office use BMPs for waste management as appropriate.

continued protection of the water supply.

- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funds are available, each program year, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Developing a Wellhead Protection Plan
- Recommended Source Protection Measures Fact Sheet



# Source Water Assessment and Protection (SWAP) Report for Scantic Valley Water District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
October 28, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	Scantic Valley Water District
<i>PWS Address</i>	Hampden
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120023
<i>Local Contact</i>	Mr. Michael Framarin
<i>Phone Number</i>	413-624-3349

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1120023-01G	240	592	Moderate
Well #2	1120023-02G	275	728	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Hampden is a town in southern western Massachusetts along the Connecticut border. The Scantic Valley Water District is a small municipal district with 10 service connections serving residential homes and one educational/nature center. Hampden does not have a municipal wastewater system and therefore all facilities utilize on-site septic disposal systems. The District operates two 6-inch diameter, gravel developed wells located within the watershed of Big Brook. Based on the results of 48-hour pumping tests conducted in 1998 and 1999, the sources have estimated yields of



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

approximately 15 gallons per minute. However, because of Zone I land use restrictions, the approved withdrawal rates for the wells are 6 gpm and 10.25 gpm, respectively.

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I radii, based on the approved daily pumped volume from the wells are 240 feet and 275 feet, respectively. The IWPA radii are 592 and 728 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Wells #1 and #2 are located within an unconfined sand and gravel deposit. The upland immediately adjacent to the wells is part of an eroded glacial outwash delta and stream terrace deposit. The well logs for the wells did not indicate a confining, protective clay layer in the vicinity of the wells. The deposits were laid down in a bedrock valley during the recession (melting) of the glaciers some 12,000 year ago. More recent alluvial deposits have been laid in the floodplain of Big Brook. The bedrock underlying the area is mapped as the Glastonbury Gneiss. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for wells #1 and #2 are in compliance with the Zone I requirements and do not have any activities except passive recreation within it. The Zone I is owned and controlled by the Audubon Society but there is a conservation restriction on the land that was approved by the DEP. The IWPA includes low-density residential development and the Audubon nature center along with the associated parking, septic systems and activities. It is likely that if the Zone II were delineated for the wells, it may not include some of the identified threats within this report. There are few potential sources of contamination within the mapped drinking water supply protection areas.

#### Key issues include:

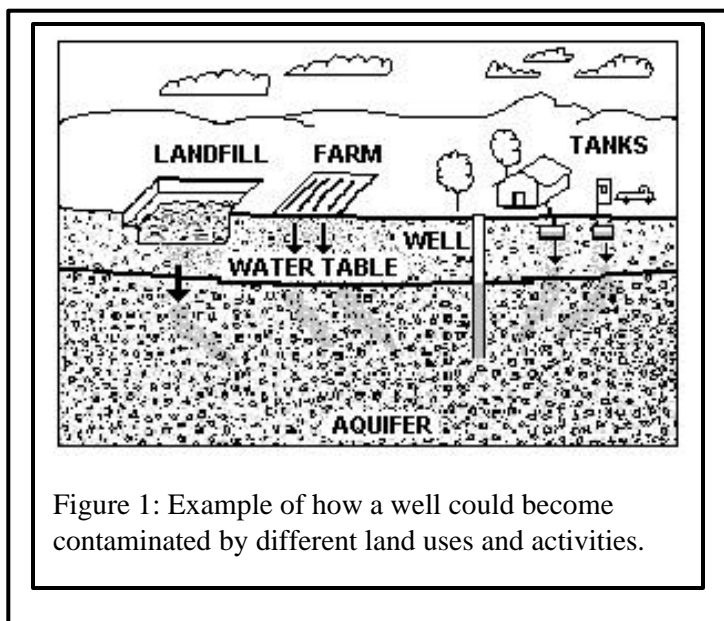
1. **Transportation corridor**
2. **Residential land use**

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Yes	Moderate	Supply BMPs to residents
Institutional – nature center	No	Yes	Moderate	Septic system and parking

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).





The overall ranking of susceptibility to contamination for the Scantic Valley Water District wells is moderate based on the presence of a few moderate ranked potentially threatening land uses or activities in the IWPA. As noted, the actual recharge area for the wells may be somewhat different than the IWPA and the District may wish to consider delineating the Zone II to assist in the long-term protection of the wells. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**1. Transportation corridor** – The well is located on a rural residential road that is relatively lightly traveled. The greatest threat from the road are deicing materials, an accidental spill and/or illegal access. The area has been fenced recently to control access.

**Transportation corridor Recommendations:**

- ✓ Work with the Town to ensure that road runoff is directed where feasible, to an area downgradient of the well.

**Glossary**

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the Water Department the Town and State Police in the event of an accident near the wellhead.

**2. Residential Land Use** – There are several residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

#### **For More Information:**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Scantic Valley Water District should review and adopt the key recommendations above and the following:

#### **Priority Recommendations:**

- ✓ Continue efforts to control access to Zone I and monitor activities in the IWPA area.
- ✓ Consider delineating the Zone II for the wells to better focus protection on the actual recharge areas for the wells.

#### **Zone I:**

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use BMPs within the Zone I for treatment chemicals.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.

#### **Planning:**

- ✓ Consider investing in the delineation of a Zone II contribution area to improve protection planning for the well. In the meantime, work with local planning and Board of Health officials to develop Aquifer Protection District Bylaws and to include the IWPA in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Copies of this report have been forwarded to the water supplier and Town officials.

### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
HAMPDEN SENIOR CENTER



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 2, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Hampden Senior Center
<i>PWS Address</i>	104 Allen Street
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120024

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1120024-01G	272	711	Low	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

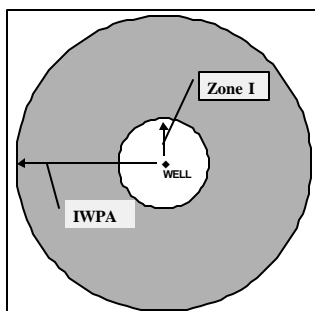
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1120024-01G)**

Zone I = 272 ft.  
IWPA = 711 ft.



### How was my Well's Susceptibility Determined?

Your well's **low** susceptibility to potential microbial threats is based on the absence of septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
ANNIE'S PLACE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Annie's Place
<i>PWS Address</i>	546 Main Street
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120026

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1120026-01G	205	512	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

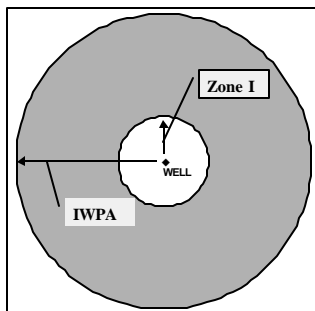
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1120026-01G)**

Zone I = 205 ft.  
IWPA = 512 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as fuel oil within the IWPA. Other moderate threats include local roads and parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 2001 Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
CFI DBA DAILY MART



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	CFI DBA Daily Mart
<i>PWS Address</i>	500 Main St
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120028

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1120028-01G	100	411	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

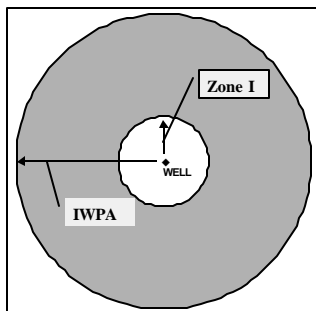
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1120028-01G)**

Zone I = 100 ft.  
IWPA = 411 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on a waste oil underground storage tank and the local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
MT. VIEW DRIVE IN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 18, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Mt. View Drive In
<i>PWS Address</i>	25 Allen Street
<i>City/Town</i>	Hampden, Massachusetts
<i>PWS ID Number</i>	1120030

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1120030-01G	100	413	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

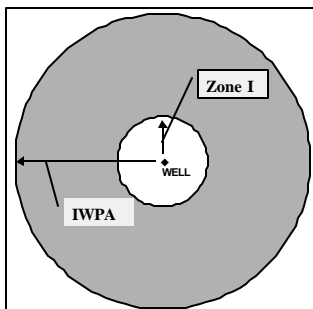
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1120030-01G)**

Zone I = 100 ft.  
IWPA = 413 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA and hazardous materials storage within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

## Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Shaker Heights Association

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	Shaker Heights Association
<i>PWS Address</i>	Skyline Drive
<i>City/Town</i>	Hancock, Massachusetts
<i>PWS ID Number</i>	1121001
<i>Local Contact</i>	Mr. William Enser
<i>Phone Number</i>	413-2431416

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1121001-01G	190	489	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Shaker Heights Association is a residential development located in Hancock, a small rural, hilltown in western Berkshire County on the New York state border. The community consists of 20 homes on the western slope of Mt. Lebanon and some lesser, unnamed hills of the Taconic Range. Hancock does not have municipal water and sewer systems; therefore, the community is served by two, on-site water supply wells and wastewater is discharged through individual on-site septic systems. The wells are located topographically upgradient of the development.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 is a 6-inch diameter, 250-feet deep, bedrock well located approximately 190 feet from one of the homes of the community. Well #2 is located 40 feet from Well #1 and is a 6-inch diameter, 570-feet deep, bedrock well. Well #1 works as the main source and Well #2 pumps as a back-up to supply water at times of peak demand. Water from the wells is pumped to a storage tank near the wells.

The geologic mapping of the area indicates thin overburden material of till with numerous exposures of bedrock. Geologic mapping also identifies the bedrock as metamorphic equivalents of the sedimentary and volcanic rocks of the Taconic Allochthon, predominantly a chloritoid-rich schist and phyllite.

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the Title 5 estimated volume from the wells, are 190 feet and 489 feet, respectively. Metered data for the last three years ranges from 1500 gallons per day to 6800 gallons per day; these data are inconsistent and unreliable to confirm actual water use at the Association. The Department suggests that you read the meter regularly to determine actual water usage and utilize the data to manage the system. The Department may revise the Zone I and IWPA based on actual use. Please refer to the attached map of the Zone I and IWPA.

There is no record or evidence of a continuous, confining and protective layer such as thick till or clay, in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

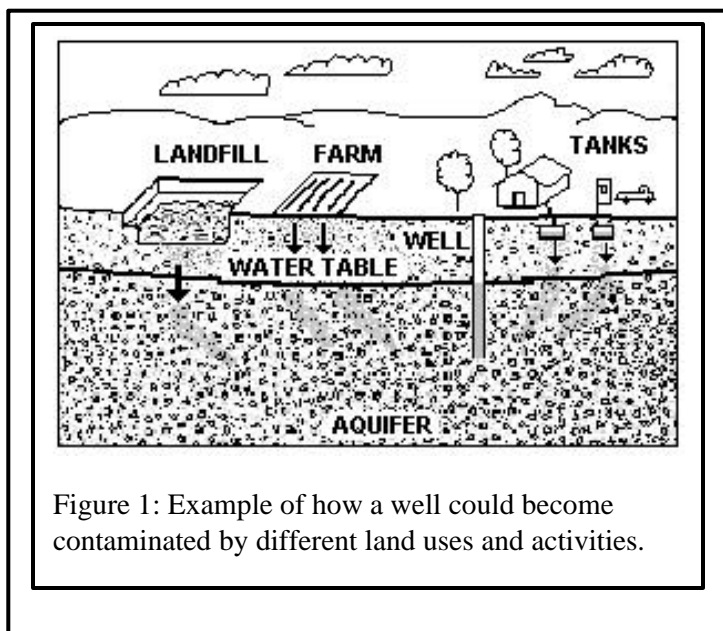
The well is fairly remote and the protection areas include a hiking trail, forest and two residences on the edge of the IWPA.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Remove all non-conforming activities from Zone I.
Tractor storage shed/storage of woodchips and other debris	Yes	Yes	High	The tractor contains petroleum products and recently there are debris and woodchips stored in the Zone I.
Residential	No	Yes	Moderate	Supply BMPs to residents.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).





**Key issues include:**

1. **Non-conforming Zone I;**
2. **Maintenance shed; and**
3. **Residential land use.**

The overall ranking of susceptibility to contamination for the Shaker Heights supply wells is high based on the presence of at least one high ranked potentially threatening land use or activity in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

1. **Non-conforming Zone Is** – Currently the wells do not meet DEP’s restrictions, which only allow water supply related activities or other non-threatening activities in the Zone I. The Zone Is contain a tractor shed and the 190 feet Zone I is just on the edge of one of the homes. As noted previously, the Zone I may in fact be larger or smaller than the 190 feet but it cannot be determined with the currently available

meter data. Recently it has been noted that storage of debris and woodchips is occurring adjacent to the tractor garage. This activity is not permitted in the Zone I. In addition it appears that the Zone I is not entirely owned by the Association. However, the Zone I area to the east that is not owned by the Association is owned by the Department of Conservation and Recreation and is unlikely to be developed. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

**Recommendations:**

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP’s Zone I requirements.
- ✓ Do not store debris or any other materials within Zone I.
- ✓ Restrict automobile access to Zone I.
- ✓ Control access to the wellhead areas with sanitary seals and secure facilities.
- ✓ Inspect the wells regularly to ensure the integrity of the cap, sanitary seal and the drainage around the well is directed away from the wells.

2. **Tractor shed** – The tractor is stored in a garage within the Zone I. The only petroleum products stored in the garage are those in use within the equipment.

**Recommendations:**

- ✓ Do not store any other fluids in the shed and check regularly for leaks and spills.
- ✓ Prohibit access to the area.
- ✓ Do not allow the accumulation of debris or other items within the protection areas.

2. **Residential Land Use** – There are two residences within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-feet to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

## 4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Department commends the Association for previous efforts to protect the source such as removing the fuel tank for the tractor from the protection areas, but there is still work needed to fully protect the sources. The water supplier should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Monitor and control activities in the Zone I and IWPA areas.
- ✓ Consider ways to protect the well if activities cannot be controlled.
- ✓ Ensure the integrity of the sanitary caps and seals at the wells.

### Zone I:

- ✓ Prohibit any new, non-water supply activities from the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect drainage in the Zone I, downgradient and away from the well area.

### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate residents, neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Be sure that the local emergency responders know where your sources are located and notify you in the event of an accident in the vicinity of your well.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.s.c.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Suggest that the town review the fact sheet available online and call the local office of the NRCS for assistance: <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. Copies of this report have been forwarded to the water supplier and Town officials.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
BERKSHIRE VISTA RESORT



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Berkshire Vista Resort
<i>PWS Address</i>	312 Kittle Rd
<i>City/Town</i>	Hancock, Massachusetts
<i>PWS ID Number</i>	1121002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1121002-01G	270	700	High	Moderate
Well #2	1121002-02G	140	442	High	Moderate
Well #3	1121002-03G	140	442	High	Moderate
Well #4	1121002-04G	204	509	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

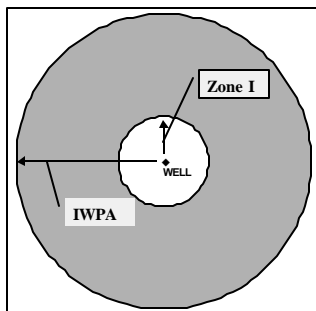
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1121002-01G)**

Zone I = 270 ft.  
IWPA = 700 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I of Well #1 and the IWPAs of all of the wells. Wells #2, 3 and 4 are in compliance with Zone I requirements. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I of Well #1 and the IWPAs of all of the wells.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Reports, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the wells' Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone Is and IWPAs regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the wells (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone Is;
- ✓ do not use pesticides, fertilizers or road salt within the Zone Is;
- ✓ address septic system issues in Zone Is; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

average of at least 25 individuals daily at least 60 days of the year.



**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**For**  
**Jiminy Peak Resorts, Inc.**

**What is SWAP?**

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

**SWAP and Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Jiminy Peak Resorts, Inc.
<i>PWS Address</i>	37 Corey Road
<i>City/Town</i>	Hancock, Massachusetts
<i>PWS ID Number</i>	1121004
<i>Local Contact</i>	Mr. John Sullivan
<i>Phone Number</i>	(413) 238-5344

**Sources: Zone II GIS ID #358**

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>Source Susceptibility</i>
Tubular Wellfield	1121004-06G	250	Moderate

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1121004-01G	300	880	High
Well #2	1121004-02G	325	1,104	High
Well #3	1121004-03G	274	521	Moderate
Well #4	1121004-04G	240	720	Moderate
Well #5	1121004-05G	235	576	Moderate

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes:**

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 1. Description of the Water System

Jiminy Peak is the largest ski resort in Massachusetts and is located on Potter Mountain. The ski area has operated since 1948 and the facilities have expanded into Jiminy Peak Resorts, Inc., a year-round recreational resort and residential condominium complex in Hancock, Massachusetts. Hancock is a small rural residential community situated between the Berkshire Hills and the Taconic Range on the New York border in Berkshire County. The community includes a full service ski area, seven condominium associations with over 360 units, laundry facilities, restaurants, swimming pools and a health club. The Town of Hancock does not have municipal water or sewer; therefore, Jiminy Peak's Utility Department operates a public water system and a wastewater treatment facility. The system has a groundwater discharge permit for wastewater disposal. Jiminy Peak Resorts, Inc. maintains all of the facilities at the ski area and resort, including the lifts and all of the grooming and maintenance equipment. The facility is registered as a very small quantity generator of hazardous waste and operates a waste oil burner to dispose of the limited amount of waste oil generated.

Jiminy Peak maintains and operates six groundwater supply sources. Wells #1 through #5 are 6-inch diameter wells drilled into bedrock, while Well #6 is a tubular wellfield consisting of 4-2.5-inch diameter wells drilled in a sand and gravel aquifer. The depths and approved withdrawal rates for Wells #1 through #5 are as follows: Well #1 is 300 feet deep with an approved rate of 15 gpm; Well #2 is 245 feet deep with an approved rate of 23 gpm; Well #3 is 150 feet deep with an approved rate of 10 gpm; Well #4 is 440 feet deep with an approved rate of 4 gpm; and Well #5 is 500 feet deep with an approved rate of 5.5 gpm. The wellfield 06G, consists of 4-2.5-inch diameter wells, drilled to 56 feet with a total approved withdrawal rate of 60 gpm.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. A wellfield is a series of wells located proximal to each other that are pumped simultaneously. The Zone I for a wellfield is an area defined by a 250 feet radial distance from the outside edges of the wellfield. The Zone I for source 06G terminates downgradient along the Kinderhook Creek and Bentley Brook. The Zone II is the scientifically determined primary recharge area for the source. The Zone II, contribution area for the wellfield 06G, was delineated utilizing empirical data from an extended duration pumping well and an analytical model. An IWPA is a primary

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	-	-	-	Wells #1 and #2 – Contact DEP prior to conducting any work in Zone I or expanding the system.
Underground Storage tanks	No	02G	High	Leaks, spills, or improper handling.
Above Ground Storage tanks	No	01G	Moderate	Leaks, spills, or improper handling.
Maintenance garage (hazardous materials)	No	01G	High	Floor drains are connected to a tight tank.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
High density residential	01G & 02G	01G – 04G	Moderate	Potential threats are from nitrates, erosion and microbial contaminants.
Transportation corridors/parking	02G	All	Low/ Moderate	Erosion, stormwater: leaks, spills, or improper handling; road building.
Groundwater discharge	No	02G	Moderate	Potential threats are from nitrates and microbial contaminants.
Storage	06G	06G	Low/ Moderate	Periodically materials are stored within the Zone I and Zone II. Monitor activities and prohibit storage in Zone I.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA.

The wells #1 through #5 are at various locations throughout the ski area and resort. Wells #1 and #2 are non-conforming with respect to Zone I restrictions. Well #1 is located on a slope with a chairlift and two lift lines in the Zone I. Well #2 is located in front of one of the condominium units. The IWPA's for wells #1 and #2 include most of the facilities at the resort; a lift and liftline are within the Zone I of Well #5. Wells #3, 4, and 6 have conforming Zone Is. The Zone II for well #6 includes the snowmaking pond that is lined with an impermeable liner.

Geologic mapping and field observations indicate thin overburden of till on the upland and relatively thin stratified drift (sand and gravel) deposits in the valleys. Well #6 is located within the stratified drift deposits of Kinderhook Creek. The stratified drift was deposited during the recession of the glaciers approximately 18,000 years ago. The bedrock is a complex series of folds and faults with rock mapped as phyllite and schist of the Taconic Allocthon. Wells #1 through #5 are drilled into the bedrock. There is no evidence of a confining unit at the locations of any of the wells. Wells located in these conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I, IWPA and Zone II.

The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the website for EPA's Envirofacts.

## 2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

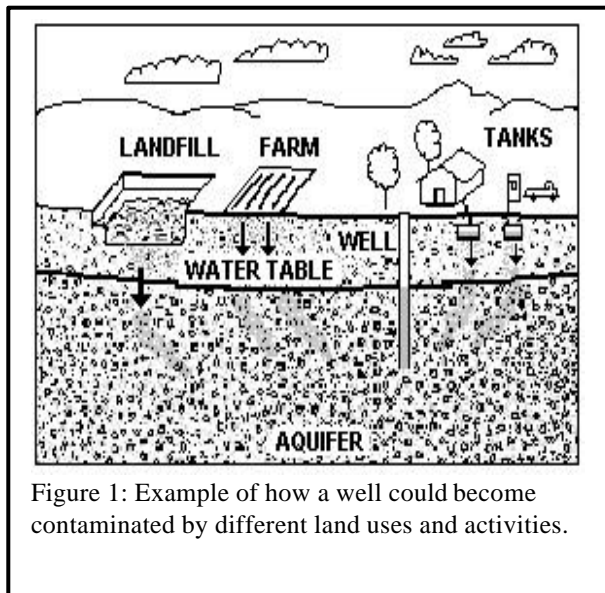


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **High Density Residential;**
3. **Hazardous materials handling (maintenance);**
4. **Wastewater treatment plant;**
5. **Underground/Above ground fuel storage; and**
6. **Transportation corridor/parking.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use or activity in the IWPA of the wells, as seen in Table 2. However, only wells 01 and 02G have high threat activities in the protection areas.

**1. Non-conforming Zone I** – Wells #1 and #2 have non-conforming Zone I with respect to activities within the Zone I. Ski trails and a lift line are located within the Zone I of Well #5. There is a ski lift and lines within the Zone I of Well #1 and condominiums in the Zone I of Well #2.

#### Recommendations:

- ✓ Although it is impossible to remove all activities within the non-conforming Zone Is, continue to work toward prohibiting/limiting activities in close proximity to the wells and using BMPs to protect the water supplies.

**2. High Density Residential/Commercial Land Uses** – The Zone I and/or IWPA for Wells #1 through #5 have high-density residential land use and other resort activities. If managed improperly, activities associated with residential and resort areas can contribute to drinking water contamination. Many of the newer facilities utilize propane for fuel. The older main lodge area has two fuel oil USTs. The maintenance facility has a new above ground storage tank. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at

<http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the MA DEP website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- V Continue the use and maintenance of BMPs for activities within close proximity to the wells.
- V Do not use pesticides or fertilizers within the Zone I of the wells. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers.
- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

- V Promote BMPs for stormwater management and pollution controls and continue monitoring and managing stormwater runoff, directing it away from the wells.

**3. Hazardous Materials Storage and Use** – The facility utilizes hazardous materials and generates hazardous waste. The new maintenance garage has floor drains that are followed by oil water separators and discharge to a tight tank. The Bureau of Waste Prevention regulates the management of hazardous waste. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review requirements for vehicle washing as appropriate or contact the UIC staff (Tony Zaharias 413-755-2122 or Rick Larson 413-755-2207) regarding additional information about vehicle washing activities.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.

**4. Wastewater Treatment Plant** – The Wastewater Treatment Plant discharges to the ground within the IWPA of Well #2. Activities associated with wastewater treatment involve storage and use of hazardous materials such as chlorine and other treatment chemicals. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Spills, leaks or mismanagement of wastewater, hazardous materials and stormwater at the plant are potential sources of contamination.

**Wastewater Treatment Plant Recommendations:**

- ✓ Ensure the wastewater treatment facility is operated and maintained according to DEP requirements.
- ✓ Work to have stormwater drains and the drainage system around the wastewater treatment plant mapped.
- ✓ Use best management practices for proper handling of materials and in containing spills and leaks.

**5. Underground and Above Ground Storage Tanks (UST)** – There are two USTs and one AST located at the facility within the IWPA of Well #1 and/or Well #2. The AST at the maintenance garage is new and the two USTs contain fuel oil.

**Recommendations:**

- V USTs in close proximity to the water supply should be closely monitored for signs of leaking or failure and during deliveries. Review stormwater flow direction and anticipate control of a potential spill during delivery. Replace and upgrade tanks as appropriate.
- V Continue to evaluate and consider a replacement well location and use of alternative fuel, as is feasible.
- V Any upgrades and modification to fuel storage facilities must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- V Require fuel lines to be sleeved to protect from leaks or have appropriate protection.
- V Review construction details for the tanks to ensure that they include overfill protection. Retrofit those without containment, as is feasible.
- V Ensure that a spill response plan is included in the emergency response plans and ensure spill containment equipment is available. Include plans of storm drain systems in the emergency response plan.

**6. Transportation corridor and parking** – The access and parking areas for the facilities are within Zone I of Well #2 and the IWPA of Wells #2 through #5. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the sources' susceptibility to contamination. Jiminy Peak is commended for recent development of wells that are in compliance and is encouraged to use diligence in monitoring activities within and near protection areas. The water supplier should review and adopt the key recommendations above.

#### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Hancock Elementary School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 23, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Hancock Elementary School
<b>PWS Address</b>	Route 43
<b>City/Town</b>	Hancock, Massachusetts
<b>PWS ID Number</b>	1121009
<b>Local Contact</b>	Ms. Jane Roberts
<b>Phone Number</b>	(413) 458-8224

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA</b>	<b>Source Susceptibility</b>
Well #1	1121009-01G	100	422	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Hancock Elementary School is a small, rural school with a total student and staff population of approximately 75 people per day, located on Route 43 in Hancock, Massachusetts. Hancock is a small rural residential, recreational community situated between the Berkshire Hills and the Taconic Range on the New York border in Berkshire County. The Town of Hancock does not have municipal water or sewer; therefore, the school operates a single public water supply well and disposes a wastewater through an on-site septic system. The school uses fuel oil and has a single



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

underground storage tank adjacent to the school and there are three boiler rooms at the facility. Route 43 has infiltration storm drains and a swale along the edge of the road; the swale drains to the Rathburn Brook and eventually to Kinderhook Creek. The school operates a single 8-inch diameter, 137 feet deep bedrock well that was installed in 1970 and has approximately 50 feet of casing. The estimated yield of the well is approximately 5.5 gpm, however the school utilizes less than 1,000 gallons per day.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. An Interim Wellhead Protection Area (IWPA) is a primary recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA. The Zone I and IWPA protective radii for Well #1 are 100 feet and 422 feet respectively based on the maximum, daily water use reported at the school from metered data.

Geologic mapping and field observations indicate the school is located within the narrow Kinderhook Creek valley. The swamp just north of the school appears to be the headwaters of the Kinderhook Creek, which flows south along the east boundary of the schoolyard. The Kinderhook Creek valley is a narrow, relatively shallow buried, bedrock valley that was filled with stratified drift (sand and gravel) deposits. The stratified drift was deposited during the recession of the glaciers approximately 18,000 years ago; recent streams later reworked the sand and gravel and deposited additional alluvium in the valley. The bedrock is a complex series of folds and faults with rock mapped various metamorphic rock types mapped of the Vermont Stockbridge Valley Autochthon and Taconic Allochthon. The bedrock in valley, in the immediate vicinity of the well is mapped as the calcite marble of the Stockbridge Formation. There is no evidence of a continuous confining, clay layer in the immediate vicinity of the well. Wells located in these conditions are considered aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the website for EPA's Envirofacts.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Conforming Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Underground storage tank	No	Yes	High	Leaks, spills, or improper handling. Floor drains in the boiler room were sealed and fuel lines were sleeved.
Transportation corridors, parking and stormwater/infiltration	No	Yes	Moderate	Control the use of deicers and coordinate with emergency response personnel.
School	No	Yes	Moderate	Use BMPs for school facilities
Agriculture	No	No	--	Rotation of row crops just outside of the IWPA
Residential	No	Yes	Moderate	One lot partially in IWPA

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

## 2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination. Although the agricultural activities are outside of the Zone I and IWPA, because the IWPA is not a scientifically determined recharge area, the DEP often identifies activities that are near source.

### Key issues include:

1. **Zone I;**
2. **School and residential;**
3. **Underground fuel storage**
4. **Transportation corridor/parking.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use or activity in the IWPA of the well, as seen in Table 2.

**1. Conforming Zone I** – Well #1 has a conforming Zone I with respect to ownership and activities within the Zone I. There is a play structure partially within the Zone I of Well #1. The DEP allows some passive recreation and other non-threatening activities within the Zone I. However, the water supplier does need permission to conduct any additional activities in the Zone I.

### Recommendations:

- ✓ Continue to work toward prohibiting/limiting activities in close proximity to the well and using BMPs to protect the water supplies.

**2. School and residential** – The school facilities and part of a residence are within the IWPA for the well. Elementary schools generally use only household hazardous materials and the recommendations for small schools are similar to those for residents. There are state and federal controls on some activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the IWPA of the well. Potential exists for contamination of the well by onsite use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. Storm drains in the parking areas at the school drain directly into the ground. If managed improperly, activities associated with residences and the school can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### School and Residential Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the MA DEP website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

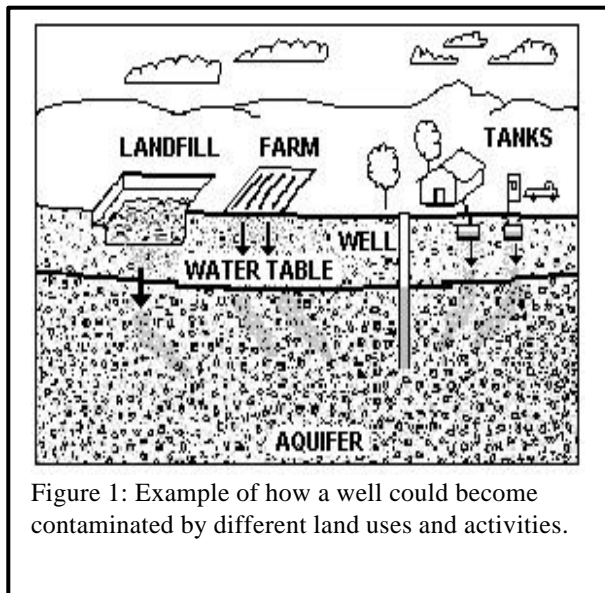


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Continue the use and maintenance of BMPs for activities within close proximity to the well.
- ✓ Continue to prohibit the use pesticides or fertilizers within the Zone I of the well. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers.
- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website at the following website [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html) for additional information
- ✓ Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should also be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**3. Underground Storage Tanks (UST)** – There is one UST at the facility within the IWPA of Well #1. The school had all of the fuel lines sleeved and investigating options for maintenance to the UST leak detection and monitoring system.

#### Recommendations:

- ✓ USTs in close proximity to the water supply should be closely monitored for signs of leaking or failure and during deliveries. Review stormwater flow direction and anticipate control of a potential spill during delivery. Replace and upgrade tanks as appropriate.
- ✓ Evaluate and consider the use of alternative fuel, as is feasible.

- ✓ Any upgrades and modification to fuel storage facilities must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements for storage tanks. Consult with the local fire department or your consultant for any additional local code requirements regarding USTs .
- ✓ Review construction details for the tanks to ensure that they include overfill protection.
- ✓ Ensure that a spill response plan is included in the emergency response plans and ensure spill containment equipment is available. Include plans of storm drain systems in the emergency response plan.

**4. Transportation corridor and parking** – The parking areas for the school and a portion of Route 43 are within the IWPA of the well. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will reduce the sources' susceptibility to contamination. The Hancock School is commended for past development of a source away from most activities and work conducted to sleeve fuel oil lines and sealing of floor drains. The DEP encourages continued diligence in monitoring activities within and near protection areas. The water supplier should review and adopt the key recommendations above. Consider contacting the agricultural property land owner just to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Call the local office of the NRCS in Pittsfield at 413-443-6867 ext. 3 for assistance or review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
PATRIOT RESORTS



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Patriot Resorts
<i>PWS Address</i>	Brodie Mountain Rd
<i>City/Town</i>	Hancock, Massachusetts
<i>PWS ID Number</i>	1121010

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1121010-01G	374	1,891	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



## What is Susceptibility?

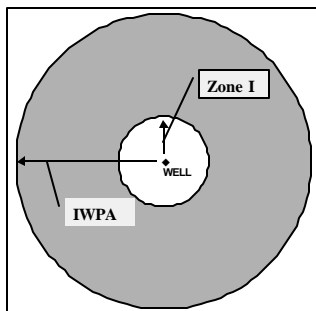
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1121010-01G)**

Zone I = 374 ft.  
IWPA = 1,891 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the wastewater system components within the IWPA of the well; however the well is in compliance with DEP Zone I requirements. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the IWPA.

This source water assessment report is based on information provided by you on your New Source Approval Process reports, Public Water Supply Annual Statistical Report, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





# Source Water Assessment Program (SWAP) Report For Beaver Pond Meadows Condominiums

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 12, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Beaver Pond Meadows Condominiums</b>
<b>PWS Address</b>	<b>Jerricho Road</b>
<b>City/Town</b>	<b>Hancock, Massachusetts</b>
<b>PWS ID Number</b>	<b>1121011</b>
<b>Local Contact</b>	<b>Jim Mucci</b>
<b>Phone Number</b>	<b>413-738-5500</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1121011-01G	350	1424	Moderate
Well #2	1121011-02G	350	1424	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Beaver Pond Meadow Condominium wells serve 27 condominiums (80 bedrooms total) and a swimming pool. Both wells, located near Beaver Pond, are 245-foot deep, 6-inch diameter drilled bedrock wells with approved yields of 32 gallons per minute each. Each well's Zone I and Interim Wellhead Protection Area (IWPA) radii are 350 feet and 1424 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. These protective areas have been calculated based on the approved pump rates for the wells; however, the actual recharge area to the well may be significantly larger or smaller than the IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

USGS mapping shows the bedrock in the area as quartz-mica schist. A hydrogeologic study of Hancock indicates the wells are drilled within an area of shallow surface sand and gravel overburden. This information is based in part on drilling logs. There is no mapped confining, protective clay layer in the immediate vicinity of the wells. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The wells serving the facility have no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming use in Zone Is;**
2. **Low density housing; and**
3. **Septic system.**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of a few moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming use in Zone I** - The Zone Is for both wells are nonconforming with respect to DEP land use restrictions which allow only water supply related activities in the Zone I. Beaver Pond and a portion of one of the condominium buildings are located within the Zone I of the wells. The public water supplier does not own and/or control all land encompassed by the Zone I of the wells. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System	No	Both wells	Moderate	See septic systems brochure attached
Parking lot, driveways & roads	Both wells	Both wells	Moderate	Limit road salt usage and maintain drainage system away from wells
Low density Housing	Both wells	Both wells	Moderate	Monitor parking area for leaks, see attached septic systems brochure

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**2. Low Density Housing --** The Zone I contains a condominium unit with associated parking. The IWPA contains the rest of the condominium units, also with associated parking. The most significant threats from residential areas are the septic systems due to lack of maintenance and improper disposal of non-sanitary waste. Another potential threat from residential users is mismanagement of household waste.

### Recommendations:

- ✓ Monitor roadside for spills and leaks.
- ✓ Encourage residents to utilize local household hazardous waste collection days.
- ✓ Supply residents with information about BMPs for household hazardous waste management and lawn care.

**3. Septic Systems --** The septic system for the entire facility is located within the IWPA. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Beaver Pond Meadow Condominiums is commended for using adequate signage denoting the public water supply area. Beaver Pond Meadow Condominiums should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Maintain the road and parking lot drainage system that directs runoff water in the Zone I away from well.
- ✓ Utilize BMPs and restrict activities that could pose a threat to the water supply, especially in the Zone I.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.

- ✓ Remove all non-water supply activities from the Zone I when possible to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities, gating roads if necessary, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator. Post labels as appropriate on raw materials and hazardous waste.

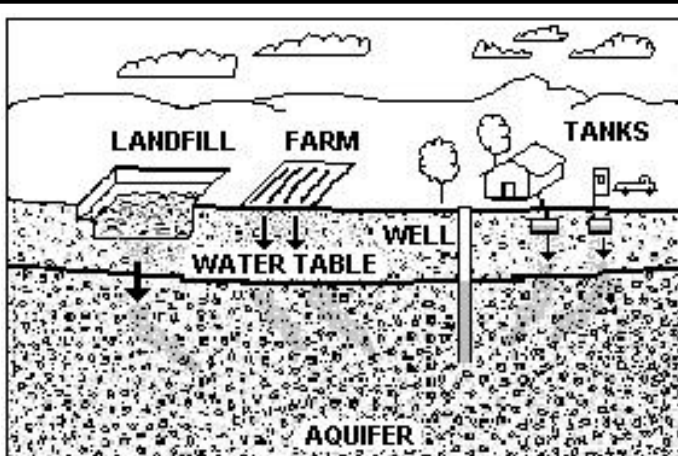


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- V Post drinking water protection area signs at key visibility locations.

### Facilities Management:

- V Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property. Do not use fertilizer, herbicides, or pesticides in the Zone I.
- V Septic system components should be located, inspected, and maintained on a regular basis.
- V Protective collars around wellheads should slope away from well.

### Planning:

- V Work with local officials in Hancock to develop a protection district with bylaws and include Beaver Pond Meadow Condominiums IWPA's in an Aquifer Protection District Bylaws to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response application package for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Source Water Assessment Program (SWAP) Report For Wheelwright Water District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 2, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Wheelwright Water District
<b>PWS Address</b>	Church Street
<b>City/Town</b>	Hardwick, Massachusetts
<b>PWS ID Number</b>	21240002
<b>Local Contact</b>	Thomas Collett
<b>Phone Number</b>	

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>Zone II</b>	<b>Source Susceptibility</b>
Well #1	2124002-01G	397	# 500	High
Well #2	2124002-02G	288	# 500	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Wheelwright Water District gets its water supply from two wells (Well #2 & #3) off Church Street in the Village of Wheelwright, located in the Town of Hardwick. The wells are located between Route 32 and the Ware River, east of Route 32 and approximately 500 feet south of Broadmeadow Brook. Well #3 is a replacement well for Well #1. Well #3 is a 12-inch diameter gravel packed well. Well #2 is a 12-inch diameter well which was installed in 1970 to a depth of 55 feet. Each well has a Zone I of 397 feet and a DEP approved Zone II. The geology at the site consists of fine to coarse-grained sand, gravel and cobbles with intermittent layers of sand and clay to a depth of approximately 70 feet below grade. A layer of fine to medium silty sand with trace gravel is found between 65 to 67 feet below grade. The well is located in an aquifer with a high vulnerability to



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II or, in the absence of a Zone II, an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** is the larger area that contributes water to the well as defined by a hydrogeologic study.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Zone II.

contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and Zone II. The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) With Heating Oil;**
3. **Railroad Tack;**
4. **Sand and Gravel mining and washing; and**
5. **Transportation Corridor.**

The overall ranking of susceptibility to contamination for the wells is High, based on the presence of at least one high threat land use or activity in the Zone II, as seen in Table 2.

1. **Zone Is** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Wheelright Water District's Zone Is contain buildings (elderly housing). The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use pesticides, fertilizers or road salt within the Zone Is.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Fuel Storage Above Ground	Both wells	Both Wells	Moderate	Tank is on cemented surface in the basement.
Railroad track	Both wells	Both wells	High	Spills of hazardous chemicals; pesticide use for vegetation control.
Sand & Gravel mining & washing	Both wells	Both wells	Moderate	
Transportation Corridor	Both wells	Both wells	Moderate	Route 32
Structures	Both Wells	Both Wells	-	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

2. **Aboveground Storage Tanks (AST)** – There are ASTs without secondary containment located on cemented floors in the building. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

### Recommendation:

- ✓ The Department recommends that 110% secondary containment for the AST in the buildings be provided. Aboveground storage tanks in your Zone II should be located on an impermeable surface. Comply with all provisions of the regulations regarding AST.
- ✓ Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire department for any additional local code requirements regarding AST.

2. **Railroad Track** – A railroad corridor runs through the Zone Is and Zone II. Railroad corridors serving passenger and/or freight trains are potential contaminant sources due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of railroad rights of way can introduce contaminants to a water supply through herbicide application for vegetation control. Accidents can release spills or engine fluids and commercially transported chemical.

### Recommendation:

- ✓ Contact your local Board of Health to ensure that the Zone II is included in right of way pesticide management planning.
- ✓ Contact local fire department to ensure that the Zone II is included in Emergency Response Planning

3. **Sand and gravel mining** – A sand and gravel mining operation is located within the Zone II. Sand and gravel mining is a potential source of contamination due to the possibility of spills or leaks from heavy equipment, fuel storage, and clandestine dumping.

### Recommendations:

- ✓ Use Best Management Practices for storage, use, and disposal of hazardous materials such as fuel.
- ✓ Inspect the Zone II for signs of clandestine dumping on a regular basis.

## 4. Transportation Corridor

leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact local fire department to ensure that the Zone II is included in Emergency Response Planning

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Wheelright Water District should review and adopt the key recommendations above and the following:

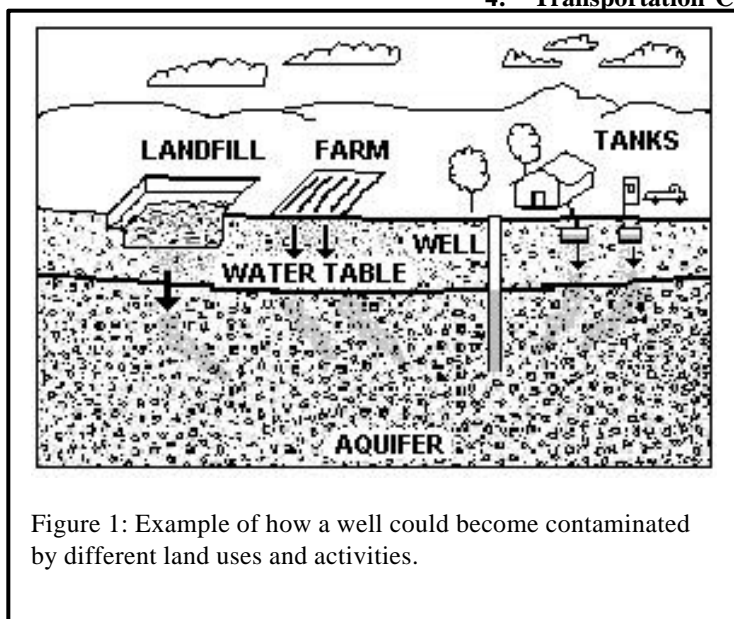


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 5030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

### Zone I:

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Check any above ground tanks for leaks, etc.
- ✓ Since the houses in the Zone I are currently in use and will continue to be in use, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on emergency response and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.

### Planning:

- ✓ Work with local officials in Hardwick to include the Wheelwright Water District Zone II in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Pesticide Use Factsheet
- Source Protection Sign Order Form

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
2-0011737	2011 BARRE RD.	HARDWICK	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

# Source Water Assessment Program (SWAP) Report For Eagle Hill School



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 6, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	Eagle Hill School
<i>PWS Address</i>	Old Petersham Road
<i>City/Town</i>	Hardwick
<i>PWS ID Number</i>	2124003
<i>Local Contact</i>	David Crevier
<i>Phone Number</i>	(413) 477-6000

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	2124003-01G	217	533	Moderate
Well #2	2124003-02G	217	533	Moderate

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

The Eagle Hill School obtains its water from two rock wells. Well #1 is located near the swimming pool and is 450 feet deep. Well #2 is located behind the cafeteria, and is 360 feet deep. Well #2 supplies water to the cafeteria and the gymnasium and Well # 1 supplies the rest of the school. Each well has a Zone I of 217 feet and an Interim Wellhead Protection Area (IWPA) of 571 feet. The wells are located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs. The wells serving the facility have no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Inappropriate activities in Zone Is,**
2. **Aboveground storage tank (AST) with fuel oil,**
3. **Septic system,**
4. **Graphics lab/small printing; & Science lab,**
5. **Transportation corridor; and**
6. **Storm water drain.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

**1. Zone I**– Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The facility's Zone Is contain a swimming pool, buildings, roads and parking area. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

**2. Aboveground Storage Tanks** – There are three ASTs with heating oil within the IWPA. The 275 gallon double-walled tanks are encased in cement, and located adjacent to the dormitory.

**3. Septic system** – The septic system is located in the IWPA of both wells. Staff and students should be trained on proper disposal of hazardous materials. The septic system was installed in 1998, and is pumped once or twice per year.

**4. Graphics/Science labs** – Projects carried out are limited in size. Projects include silk screenings, small amounts of printing, and some photography.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Aboveground storage tanks	No	Well #2	Moderate	Fuel oil tanks in cement encasement
	Building and grounds maintenance facility	No	Both Wells	Moderate	Storage shed
	Parking areas & driveway	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
	Septic System	No	Both Wells	Moderate	See septic systems brochure attached
	Graphics lab/small printing & woodworking shop	No	Both Wells	High	Waste from these areas are not alloed to be discharged to a septic system as per Title 5
	Classroom building	No	Both Wells	Moderate	Include science & art classrooms -use of acrylic paints, varnishes & nontoxic clay
	Transportation corridor	No	Well #1	Moderate	Local road.
	Storm water drain	Well #1	Both Wells	Low	In the parking area, downgradient of the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ The facility is encouraged to have a working neutralization system to handle the wastes from the laboratories.
- ✓ Discharge from photographic, art, and science classrooms must go to a DEP approved tight tank or sewer (with permission of the sewer authority), and staff and students should be trained on proper disposal of hazardous materials and waste.

**5. Transportation Corridor** – Old Petersham Road runs in front of the property, within the IWPA. The location and the volume of traffic increase the chances of contamination from accidents, spills and road salt.

**6. Stormwater drains** – One stormwater drain located within the Zone I of Well #1 is downgradient of the well. The remainder of the storm water drains are located within the IWPA's of both wells #1 and #2.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Eagle Hill School should review and adopt the following recommendations at the facility:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- ✓ Consider well relocation if Zone I threats cannot be mitigated. Please note that DEP permit approvals must be obtained prior to the installation of a new well.

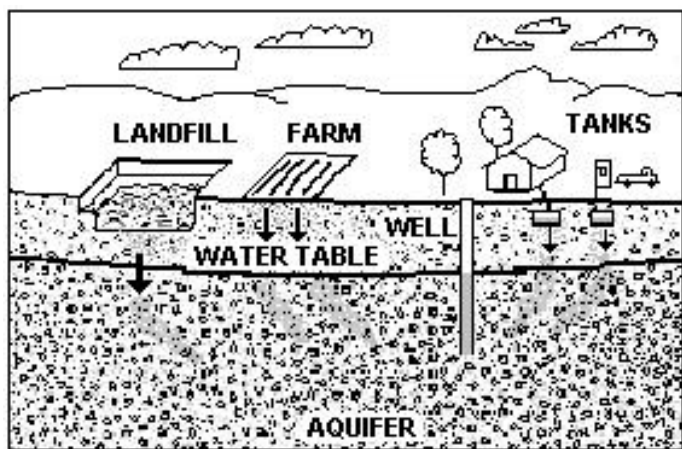


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum.
- ✓ Work with your community to ensure that storm water runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at



### **For More Information:**

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 792-7650 x 5030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

<http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm>

Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachment for more information regarding septic systems.

### **Planning:**

- ✓ Work with local officials in Hardwick to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. ATTACHMENTS**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Fertilizer Use Fact sheet

# Source Water Assessment Program (SWAP) Report For HARDWICK ELEMENTARY SCHOOL (Draft)



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date DRAFT Prepared:  
June 6, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	HARDWICK ELEMENTARY SCHOOL
<i>PWS Address</i>	LOWER ROAD
<i>City/Town</i>	HARDWICK
<i>PWS ID Number</i>	2124008
<i>Local Contact</i>	Bill Burnett
<i>Phone Number</i>	(978) 355-4668

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	2124008-01G	186	483	Moderate

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

## Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well, an 8 inch diameter bedrock well, is 410 feet deep. The well is located about 225 feet from the building, in the field. The well has a Zone I of 186 feet and an Interim Wellhead Protection Area (IWPA) of 483 feet. The site is underlain by a dense to very dense silty sand, with some gravel, cobbles, and boulders. The till is capped in some areas by well-stratified sands and gravels with a trace of some silt in a compact condition. This material is probably associated with the post-glacial Ware River. The topsoil at the site is underlain by loose orange – brown silty sand and gravel, which is probably slope wash debris from the slopes to the north and west. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

### -Inappropriate activities in the Zone I.

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one moderate threat land use or activity in the IWPA.

**Zone I-** Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains an athletic field, although the activities are very limited, and a local road. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Ensure that stormwater runoff from the local road is directed away from the Zone I.
- ✓ Continue to not use any fertilizers or pesticides on the field within the Zone I.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 3. Protection Recommendations

Hardwick Elementary School should review and adopt the following recommendations at the school:

**Table 2: Table of Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Local road	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
	Athletic Field	Yes	Yes	Low	No fertilizer use

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- ✓ Consider well relocation if Zone I threats cannot be mitigated. Please note that DEP permit approvals must be obtained prior to the installation of a new well.

### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum

### Facilities Management:

- ✓ Although the septic system is located outside of the IWPA, its components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

### Planning:

- ✓ Work with local officials in Hardwick to include the school's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure

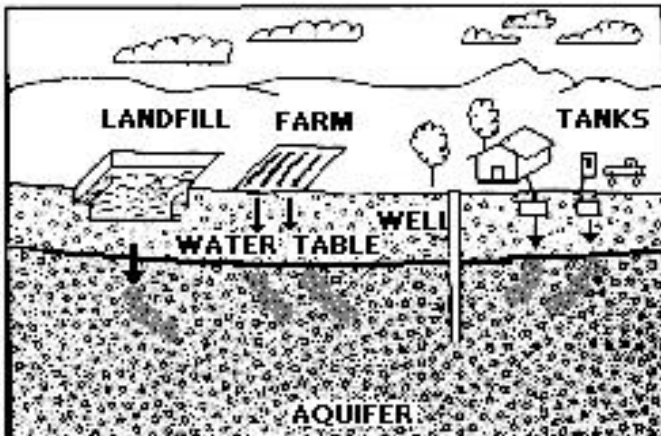


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**For More Information:**

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 5030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Hatfield Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Hatfield Water Department
<i><b>PWS Address</b></i>	59 Main Street
<i><b>City/Town</b></i>	Hatfield, Massachusetts 01038
<i><b>PWS ID Number</b></i>	1127000
<i><b>Local Contact</b></i>	Frank Motyka
<i><b>Phone Number</b></i>	(413) 247-5222

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices



## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### Groundwater Sources

Zone II #: 463

Susceptibility: High

Well Name	Source ID#
West Hatfield Well (01G)	1127000-01G

Zone II # 275

Susceptibility: High

Well Name	Source ID#
Omasta Well (02G)	1127000-02G

### Surface Water Sources

Source Name	Susceptibility: Moderate
Running Gutter Brook Reservoir	1127000-01S

Hatfield Water Department operates and maintains two wells and one reservoir. The two wells for the Hatfield Water Department are located west of I-91; 01G is in the south section of town near the border with Northampton and 02G is in the north section near the border with Whately. Wells 01G and 02G are both 12-inch diameter, gravel developed wells screened at 124 and 166 feet in depth, respectively. Each well has a Zone I radius of 400 feet. The Conceptual Zone II for each well was delineated as part of the SWAP program and based on an historical pumping rate of 250 gpm for Well 01G and an approved pumping rate of 275 for well 02G. The Zone II area for well 01G is within Hatfield and Northampton; the Zone II area for Well 02G is within northern Hatfield and Whately. The wells are located in a deep buried valley aquifer, filled with sand and gravel deposited during the recession (melting) of the glaciers some 12,000 to 18,000 years ago. At that time, Glacial Lake Hitchcock was formed in this area leaving a thick layer of lake clay in some areas overlying the deeper sand and gravel aquifer. The Hatfield wells are screened in a sand and gravel deposit that is overlain by the clay layer that is estimated to become thicker to the east and thinner to the west. There is some evidence that the clay layer "pinches out" to the west where much of the aquifer recharge is likely to occur.

The wells are located in aquifers with a high vulnerability to contamination. Although there is a confining clay unit in a portion of the Zone II, the confining unit is not contiguous throughout the area and therefore, due to the absence of

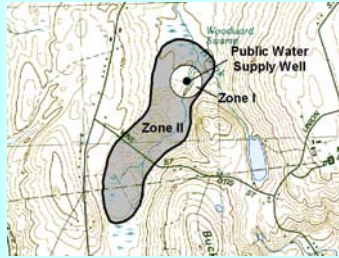
hydrogeologic barriers (i.e. confining clay layer) that can prevent contaminant migration from the ground surface, the aquifer is considered vulnerable. Please refer to the attached map for the Zone II delineation outlines.

The Running Gutter Brook Reservoir for the Hatfield Water Department is located in the northwest corner of Hatfield, near the borders with Whately and Williamsburg. A portion of the water supply protection areas for the reservoir extends in to the town of Whately. Please refer to the attached map of the watershed.

The water from the reservoir is filtered and disinfected. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



## Section 2: Land Uses in the Protection Areas

The Zone IIs and watershed for Hatfield are primarily forested, with smaller portions consisting of agriculture, residential, and commercial/industrial land uses (refer to the attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Activities in Zone A
3. Residential Land Uses
4. Transportation Corridors
5. Hazardous Materials Storage and Use
6. Agricultural activities
7. Oil or Hazardous Material Contamination Sites
8. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high,

based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone I** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

**Well 01G** - There are dirt bike trails and 1 residential property within the Zone I.

**Well 02G** - There are 2 residential properties within the Zone I, and Interstate 91

passes through the Zone I.

### Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

**2. Activities in Zone A** - Land use activities within a Zone A may have an impact on surface water sources. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. Human activities also can pose significant threats. The following activities occur in the Zone As of the system's reservoirs:

**Running Gutter Brook Reservoir (01S)** - There is a local road within the Zone A of the reservoir and a road that crosses one of the tributaries. Some of the trails and roads throughout the watershed are utilized for recreation. Little impact has been noted from these activities by the watersupplier.

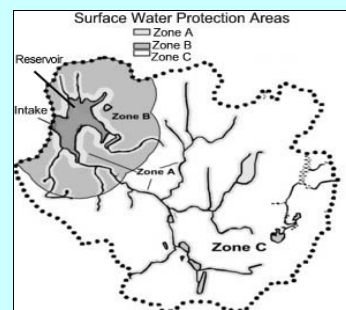
### Zone A Recommendations:

- ✓ Closely monitor all activities within the Zone As.
- ✓ Keep any new prohibited activities out of the Zone A.

**3. Residential Land Uses** – Approximately 21% of the Zone II for 01G, 9% of the Zone II for Well 02G, and less than 1% of the Running Gutter Brook

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

watershed consist of residential areas. All of the areas use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to manage new residential developments in the water supply protection areas.

**4. Transportation Corridors** - Interstate 91 runs through the protection areas for Well 02G. Local roads are present in the protection areas of the Zone IIs and watershed. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

Railroad tracks run through the edge of the Zone II for Well 02G. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

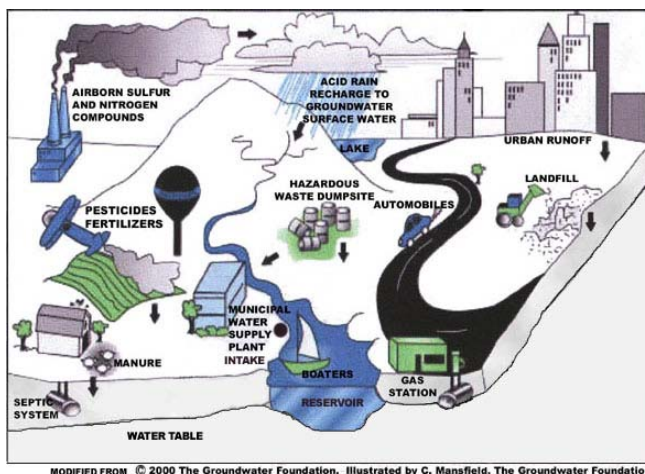


Figure 1: Sample watershed with examples of potential sources of contamination

#### Transportation Corridor Recommendations:

- ✓ Continue to regularly inspect watershed and Zone IIs for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

(Continued on page 6)

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Well Source ID	Watershed Source ID	Potential Contaminant Sources*
<b>Agricultural</b>					
Forestry Operation	1	M	-	01S	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Nurseries	2	M	02G	-	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
<b>Commercial</b>					
Auto Repair Shops	5	H	02G	-	Spills, leaks, or improper handling of automotive fluids, and solvents
Cemeteries	1	M	02G	-	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Repair Shops (Engine, Appliances, Etc.)	1	H	01G	-	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage, Uncontrolled underground injection of hazardous materials.
Railroad Tracks and Yards	1	H	02G	-	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Sand And Gravel Mining/Washing	2	M	01G, 02G	-	Heavy equipment, fuel storage, clandestine dumping: spills or leaks. Pit in Zone II for 01G not active.
<b>Residential</b>					
Fuel Oil Storage (at residences)	Numerous	M	01G, 02G	-	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	01G, 02G	-	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	01G, 02G	-	Hazardous chemicals: microbial contaminants, and improper disposal



Land Uses	Quantity	Threat**	Potential Contaminant Sources*
<b>Miscellaneous</b>			
Oil or Hazardous Material Sites	1	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transmission Line Rights-of-Way Type: gas line	1	L	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	Numerous	M	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	2	H	Spills, leaks, or improper handling or storage of hazardous materials and waste
Utility Station Transformers	1	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

**5. Hazardous Materials Storage and Use** – Less than 5 % of the Zone IIs for Hatfield’s wells is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**6. Agricultural Activities** – There are farms throughout the protection areas. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

**7. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II for Well 02G contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 1-00048. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

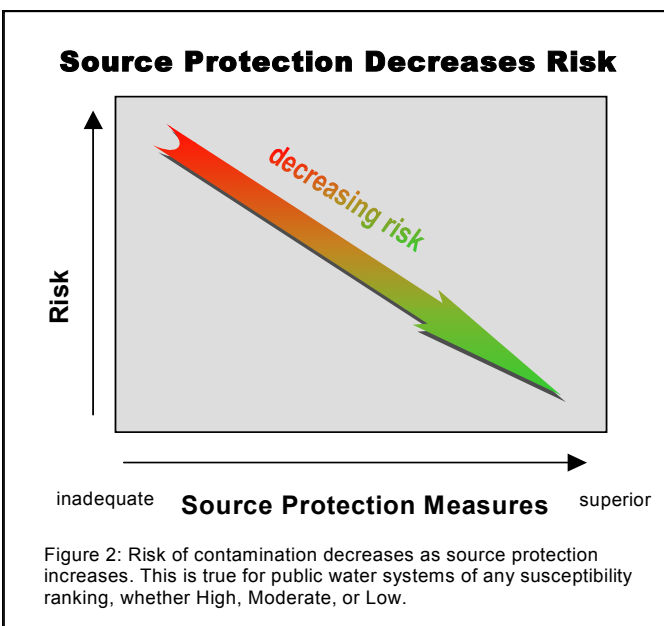
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

**8. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, the Town does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2) or Surface Water Protection regulations 310 CMR 22.20 (b) and (c). Wellhead Protection and Surface Water Supply Protection Plans coordinate community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Although Hatfield does have a Surface Water Supply Protection Plan. Plans must be updated to reflect changes within the system and activities within the watershed. There are resources available to help communities develop and modify plans for protecting drinking water supply sources.

**Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

The Hatfield Water has sold Conservation Restrictions (CR) to the MA DEM to allow public access to the watershed. Although the CR limits allowable activities, it does not specify control measures within the watershed. Wellhead Protection and Watershed Protection Plans coordinate community efforts, identifies protection strategies,



establishes a timeframe for implementation, and provides a forum for public education and outreach, and can help to pass a bylaw for control regulations. The development of successful Plans are outlined in five steps in DEP's "Developing a Local Wellhead Protection Plan" and in "Developing a Local Watershed Protection Plan" (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Water Source Protection Areas
- Identify potential sources of contamination
- Protect and manage the source protection areas
- Conduct ongoing public education and outreach

An access control and monitoring plan should be an integral part of a watershed protection plan. The assessment of potential impacts of public access to the watershed are critical in protecting the water supply and for long and short term planning for the Water Department.



Please use the guidance booklets included in the appendix to help create your plan. Compile the information supplied in the Zone II reports, this and other reports; include copies of maps outlining the protection areas (Zone I, Zone II, Zone A, Zone B, and Zone C) and detail the protection measures in place. Outline a plan with a time line for completion of the various plan components. Submit your written report to the DEP Regional office and/or Boston office for approval.

#### **Protection Planning Recommendations:**

- ✓ Create and formalize an access management plan for the watershed and update your Watershed Protection Plan.
- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials in Hatfield, Whately, and Northampton to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ Include provisions for controlling public access to the Zone Is and watershed in any future planning.
- ✓ Because so much of the water supply protection areas are forested, review current strategies for best management of forested lands.
- ✓ If there are no local surface water supply protection controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.20 (b) and (c). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

Other land uses and activities within the Zone IIs and watershed that are potential sources of contamination are included in Table 2. Refer to Appendix B for more

information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Daily inspections of Zone II and watershed lands.
- Purchase of additional watershed land.
- The preparation of a Watershed Protection Plan for the watershed.

*(Continued on page 9)*

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Prepare and implement an Access management plan for land under conservation restrictions that allow public access. Lack of control and monitoring of public access may result in negative impacts to the water supply and infrastructure.
- ✓ Continue to inspect the Zone Is and As regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your protection areas and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Continue to inspect and protect open space in the Zone 1. Where land is not available for purchase, consider the use of conservation restrictions.
Are the Zone I and II posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Monitor activities in Zone I.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	<b>NO</b>	Work with the Planning Board and the Board of Health to compare land use controls to see that they meet current requirements of 310 CMR 22.21(2). Refer to <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations. Whately does have hazardous Materials Handling by laws
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a local wellhead protection plan?	<b>In the process</b>	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	<b>YES</b>	Encourage past committee to reconvene, and also include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	There are no commercial or industrial activities in the watershed, but there are some that should be inspected within the Zone IIs. For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide watershed protection education?	<b>NO</b>	Currently outreach is mainly to school groups. Increase residential outreach through bill stuffers, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs.

## APPENDIX B: REGULATED FACILITIES NEAR THE WATER SUPPLY PROTECTION AREA

**Note:** All of these facilities are outside of the Zone IIs for the system wells. However, they are within the Zone III, very near the border of the Zone II, and so runoff from a spill or leak at these facilities could drain to the Zone II.

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
131813	West Track, Inc	164 West St Rte 5	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
35129	Town of Hatfield Highway Department	10 Straits Rd	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
205621	Federal Express Corp	173 West St Route 5 & 10	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
328650	Hatfield Equipment Co	Mountain Rd	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Truck & Auto Repair (not currently registered)	Coles Meadow Road	Hatfield/ Northampton	Generator of Hazardous Waste	To be determined

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000488	361 West St	Hatfield	Oil and Hazardous Material
1-0010136*	Depot Road	Hatfield	Oil and Hazardous Material

\* Site is just outside of the Zone II area.

For more location information, please see the attached map, which has the release sites located by RTN and refer to <http://www.state.ma.us/dep/bwsc/sitelist.htm> for additional site information.



# Source Water Assessment Program (SWAP) Report for Heath Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 21, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Heath Elementary School
<i>PWS Address</i>	18 Jacobs Road
<i>City/Town</i>	Heath, Massachusetts
<i>PWS ID Number</i>	1130002
<i>Local Contact</i>	Mr. Philip O'Reilly
<i>Phone Number</i>	413-337-4742

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1130002-01G	136	436	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Heath Elementary School is a rural elementary school located on the south side of Jacobs Road in Heath. The school student and staff population is approximately 135 people per day and is served by a single potable supply well (Well #1) located north of the school.

The well has a Zone I protective radius of 135 feet and an Interim Wellhead Protection Area (IWPA) radius of 438 feet based on an approved daily withdrawal rate. The well was tested under the New Source Approval Process and approved for a withdrawal rate of 1,728 gallons per day, (gpd) or 1.2 gallons per minute, (gpm). The 6-inch diameter



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

well is drilled to a depth of approximately 500 feet below ground. The driller's log states bedrock was encountered 42-inches below grade. The bedrock was apparently highly weathered and the casing, grouted into place, extended to 66-feet below grade. Bedrock outcrops were observed during the site visit confirming the shallow depth of bedrock. The geologic mapping of the area identified the bedrock as black to green colored amphibolite, greenstone, feldspathic schists and granulite of the Hawley Formation dating from the Ordovician. Although there are stratified drift, sand and gravel deposits nearby, there is little to no soil over the bedrock in the immediate vicinity of the well. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, very few land uses and activities within the drinking water supply protection areas were identified as potential sources of contamination.

### Key issues include:

1. **Underground fuel oil storage tank (UST)**
2. **Septic System**
3. **Floor drain in boiler room**
4. **Parking and roadway**

The source is fairly well protected. The Town owns the entire Zone I area and there are no identified land use activities within the Zone I other than passive recreation (walking trail). However, the well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration from the surface. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Underground fuel oil storage tank** – The school's underground fuel oil tank and propane tank are located within the IWPA of the school well. The oil tank is located 405 feet from the well and is double walled with a monitoring system. The propane tank, also located within the IWPA, poses a minimal threat to water quality because of

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank (UST, fuel oil)	No	Yes	Moderate	Double walled tank with monitoring, edge of IWPA
Septic System components (not the leach field)	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Floor Drain in the boiler room to septic system	No	Yes	Moderate	Floor drain must be protected from accidental spills
Parking area and roadway	No	Yes	Moderate	Grassy drainage swales

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

its gaseous nature if released.

### Recommendations:

- ✓ Diligently monitor the status of the tanks and the delivery of oil.
- ✓ Consider long term planning of replacing the UST after its useful life with an above ground storage tank with containment.

**2. Septic system components in the IWPA** - The septic tank, grease trap, pipeline and distribution box are all within the IWPA of the well. A very small portion of the leach field is also on the perimeter of the IWPA. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems or discharge from the boiler room are also potential sources of contamination to the water supply.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. The school is currently not registered as a generator of hazardous waste or waste oil. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine regulatory requirements.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

**2. Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. Floor drains in an area that contains hazardous materials must be discharged to a sewer or a tight tank. The boiler room at the Heath Elementary School has a floor drain that is assumed to discharge to the septic system.

### Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. A written policy and plan should be in place during maintenance operations, especially when oil filters are changed.

- ✓ Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.

**3. Parking and roadway** - The parking area and roadway are within the IWPA of the well. Bedrock outcrops were observed along the side of Jacobs Road with the road drainage consisting of an earthen swale. Drainage from the school is discharged approximately 200 feet from the well to an area that topographically drains away from the wellhead.

### Recommendations:

- ✓ Use minimal road salt and deicers.
- ✓ Request that the Town consider paving the drainage swale along Jacobs Road, immediately adjacent to the Zone I of the well to minimize the potential impact to the well from direct infiltration of road salt and road runoff into the exposed bedrock.
- ✓ Monitor the parking lot for spills and leaks.

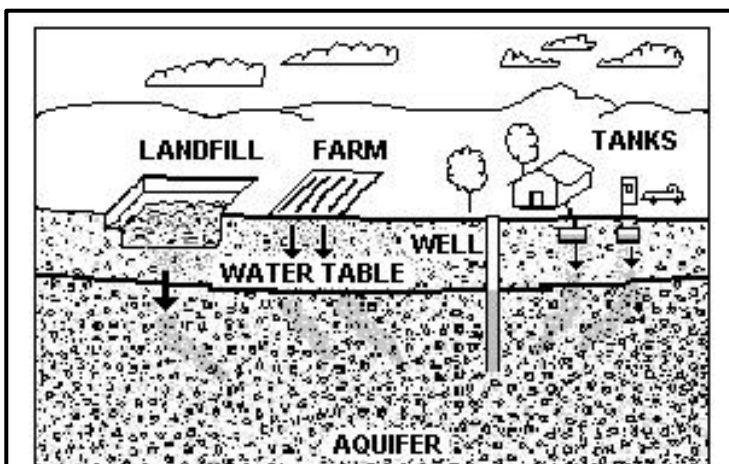


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

Other activities that were noted during the assessment were the agricultural activities within and just outside of the IWPA. Request that the landowners utilize Best Management Practices for their agricultural practices that include nutrient management. Be sure that they are aware that your facility is a public water supply. If they do not already have a farm plan, refer them to the Natural Resource Conservation Service. Alternatively, they may follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*. Information on funding and other resources for agricultural management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>.

Implementing the previously noted and following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Heath Elementary School is commended for current protection measures.

Please review and adopt the key recommendations listed above and as follows:

#### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Direct nature trails away from the wellhead. Look for evidence of unauthorized access. If necessary, fence off the wellhead to prevent access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply signs key location such along the access road and in the parking area.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.

#### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

#### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete or earthen collars around the wellhead should slope away from well.

#### Planning:

- ✓ Work with local officials to include the school well's IWPA in an Aquifer Protection District Bylaws and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Grant Program Fact Sheet
- Source Protection Sign Order Form
- Very Small Quantity Generator (VSQG) information



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Ashmere Heights Water Service

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
November 7, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Ashmere Heights Water Service</b>
<i>PWS Address</i>	<b>State Route 143</b>
<i>City/Town</i>	<b>Hinsdale, Massachusetts</b>
<i>PWS ID Number</i>	<b>1132002</b>
<i>Local Contact</i>	<b>Ms. Eleanore Robert/Mr. William Enser</b>
<i>Phone Number</i>	<b>413-243-1416</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1132002-01G	227	556	Moderate
Well #2	1132002-02G	227	556	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Ashmere Heights Water Service is a residential development located on the shore of Ashmere Lake in the town of Hinsdale, a small, rural, hilltown community in western Massachusetts. The facility is located immediately south of State Route 143. Although there is both a municipal water and sewer system in Hinsdale, only the municipal sewer serves this section of town. Therefore, the system is served by two, on-site water supply wells and wastewater is disposed through the municipal sewer system. The facility serves approximately 59 homes, most of which are seasonal and several are year round residences. During the last few years, more seasonal homes have been converted to year



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

round homes. The system is served by two wells. Well #1 is a 6-inch diameter, 375-feet deep, bedrock well located between two residences approximately 200 feet from the road with 220 feet of casing; Well #2 is a 4-inch diameter, 170-feet deep, bedrock well with 160 feet of casing.

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an Interim Wellhead Protection Area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPA radii for both wells is the same and is based on the maximum average daily pumped volume from the wells. The Zone Is and IWPAs are 182 feet and 478 feet, respectively. Please refer to the attached map of the Zone Is and IWPAs.

Wells #1 and #2 are located in an area of relatively thin overburden material of till. The bedrock is mapped as the Washington Gneiss, rusty weathering schist with layers of blue-quartz conglomerate and dacite. Although the wells have approximately 200 feet of casing, there is no record or evidence of a confining, protective layer such as thick till or clay, in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for the wells include Route 143, the apartment buildings and the well for the Ashmere Heights Water Service as well as numerous residences.

### Key issues include:

1. **Non-conforming activities within Zone I**
2. **Transportation corridor**
3. **Residential land use**

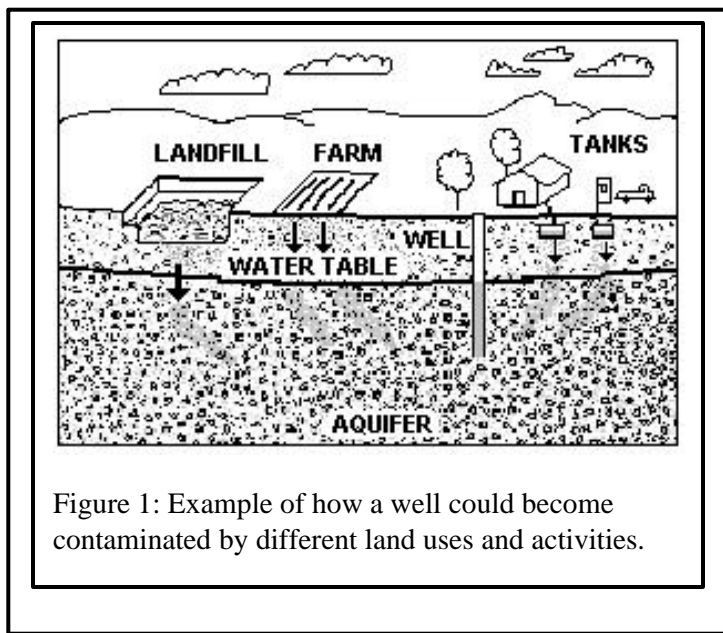
The overall ranking of susceptibility to contamination for the Ashmere Heights Water

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	Yes	Yes	Moderate	Supply BMPs to residents. Monitor activities within the entire IWPA area for potentially hazardous activities near your wells and neighbor's well(s).
Municipal Sewer	Yes	Yes	Low	Notify the Town if leaks are apparent.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).





Service supply wells is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone Is and IWPA's. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**1. Non-conforming activities within Zone Is** – The Zone I is the area immediately surrounding the wellhead where only activities associated with supplying water or other non-threatening activities are allowed. The water supplier does not own or control the entire Zone I area for either well and there are activities within the Zone I that are not allowed under the current regulations. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I extends across a public road and includes residential areas.

**Zone I Recommendations:**

✓ Control access to the wellhead areas.

- ✓ Consider relocating the well to a more protected area.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Do not use or store pesticides, fertilizers, and control the use household hazardous materials and road salt within the Zone I.

**2. Residential Land Use** – There are several residences within the Zone I and the IWPA protection areas. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. The municipal sewer serves the area. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Do not allow the accumulation of refuse within the protection areas.
- ✓ Prohibit vehicle maintenance and the use of hazardous materials within Zone I.

**3. Transportation corridor** – The well is located on a state highway that is the main route through the area. The greatest threat from the road is deicing materials, an accidental spill and or illegal access. Although the well is located within a small structure, it is located within 25 feet of the roadway.

**Transportation corridor Recommendations:**

- ✓ Work with the Town to ensure that road runoff is directed where feasible, to an area away from the well.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the public water supplier, the Town and State Police in the event of an accident near the wellhead.
- ✓ Secure the facilities that the well is in, provide a sanitary seal around the casing to prevent ponding of water and inspect the integrity of the cap and watertight seal regularly

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

## 4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Department commends the Water Service for completing some of the tasks required to protect the sources such as raising the well casings and management of activities near the wells. There is still work needed to fully protect the sources. The Ashmere Heights Water Service should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Monitor and control activities in the Zone I and IWPA areas.
- ✓ Relocate the well if activities cannot be controlled and the water quality is impacted.

### Zone I:

- ✓ Prohibit any new, non-water supply activities from the Zone I.
- ✓ Educate the residents in the area regarding the use BMPs within the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect road drainage in the Zone I away from the well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Protect the well from flooding.

### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate residents, neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Request that the town develop a Wellhead Protection District and associated bylaws and request that the IWPA for your and other water systems be included in the protection area.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

designed to protect surface and groundwater. Suggest that the town review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Copies of this report have been forwarded to the water supplier and Town officials.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Ashmere Water Service

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
November 7, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Ashmere Water Service</b>
<i>PWS Address</i>	<b>Shore Drive</b>
<i>City/Town</i>	<b>Hinsdale, Massachusetts</b>
<i>PWS ID Number</i>	<b>1132008</b>
<i>Local Contact</i>	<b>Mr. William Barton</b>
<i>Phone Number</i>	<b>800-340-6041</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1132008-01G	192	491	Moderate
Well #2	1132008-02A Proposed	192	491	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Ashmere Water Service is a residential development located on the shore of Ashmere Lake in the town of Hinsdale, small, rural, hilltown community in western Massachusetts. The facility is located on Shore Drive, off of George Schnopp Road. Although there is both a municipal water and sewer system in Hinsdale, only the municipal sewer serves this section of town. Therefore, the system is served by one, on-site water supply well and wastewater is disposed through the municipal sewer system. The facility serves approximately 26 homes, several are seasonal homes with more than 15 being year round residences. Within the last few years, the well has experienced

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

diminished capacity and the system is in the process of developing a replacement source. The new well has been installed and a pumping test has been conducted. The preliminary results indicate adequate capacity and water quality, but the well and water testing are not complete by the time this report was prepared. The new well is within 50 feet of the existing source and will be permitted as a replacement source. This report can be updated to include that well once it is complete. However, due to the close proximity of the replacement source to the existing well, the assessment for the new well will be the same as for the existing well. Well #1 is a 6-inch diameter, 360-foot deep, bedrock well located between two residences, 25 feet from the edge of the road and approximately 100 feet from the lake. Well #1 is located within a concrete vault approximately 20 feet from the road.

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the daily pumped volume from the well are 192 feet and 491 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Well #1 is located in an area of relatively thin overburden material of till. The bedrock is mapped as the Washington Gneiss, rusty weathering schist with layers of blue-quartz conglomerate and dacite. Although the new replacement source is a free-flowing, artesian, bedrock well, there is no record or evidence of a continuous, confining and protective layer such as thick till or clay, in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for the wells include Route 143, the apartment buildings and well

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Yes	Moderate	Supply BMPs to residents. Monitor activities within the entire IWPA area for potentially hazardous activities near your wells.
Municipal Sewer	Yes	Yes	Low	Notify the Town if leaks are apparent.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

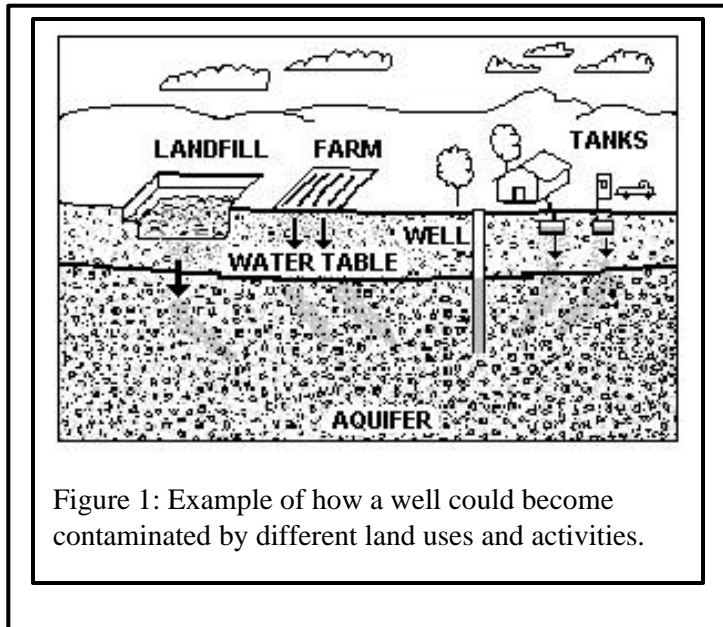


Figure 1: Example of how a well could become contaminated by different land uses and activities.

for the Ashmere lake Nominee Trust as well as numerous residences.

**Key issues include:**

1. **Non-conforming activities within Zone I**
2. **Transportation corridor**
3. **Residential land use**

The overall ranking of susceptibility to contamination for the Ashmere Water Service supply well is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**1. Non-conforming activities within Zone I** – The Zone I is the area immediately surrounding the wellhead where only activities associated with supplying water or other non-threatening activities are allowed. The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I extends across a public road and includes residential homes.

**Zone I Recommendations:**

- V Control access to the wellhead areas with sanitary seals and secure facilities.
  - V Consider relocating the well to a more protected area.
  - V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
  - V Do not use or store pesticides, fertilizers, and control the use household hazardous materials and road salt within the Zone I.
- 2. Residential Land Use** – There are several residences within the Zone I and the IWPA protection areas. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. The municipal sewer serves the area. Common potential sources of contamination include:
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
  - **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
  - **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- V Do not allow the accumulation of refuse within the protection areas.
- V Prohibit vehicle maintenance and the use of hazardous materials within Zone I.

**3. Transportation corridor** – The well is located on a state highway that is the main route through the area. The greatest threat from the road is debris materials, an accidental spill and or illegal access. Although the well is located within a vault, it is located within 20 feet of the roadway.

**Transportation corridor Recommendations:**

- V Work with the Town to ensure that road runoff is directed where feasible, to an area downgradient away from the well.



### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

- ✓ Prepare an Emergency Response Plan that includes coordination among the DEP, the public water supplier, the Town and State Police in the event of an accident near the wellhead.
- ✓ Secure the facilities that the well is in, provide a sanitary seal around the casing to prevent ponding of water and inspect the integrity of the cap and watertight seal regularly

## 4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Department commends the Water Service for previously efforts to protect the source but there is still work needed to fully protect the sources. The Ashmere Water Service should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Monitor and control activities in the Zone I and IWPA areas.
- ✓ Relocate the well if activities cannot be controlled and the water quality is impacted.

### Zone I:

- ✓ Prohibit any new, non-water supply activities from the Zone I.
- ✓ Educate the residents in the area regarding the use BMPs within the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect road drainage in the Zone I, downgradient and away from the well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Protect the well casing from flooding.

### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate residents, neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Request that the town develop a Wellhead Protection District and associated bylaws and request that the IWPA for your and other water systems be include in the protection area.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Be sure that the local emergency responders know where your sources are located and notify you in the event of an accident in the vicinity of your well.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=equip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Suggest that the town review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Copies of this report have been forwarded to the water supplier and Town officials.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Source Water Assessment Program (SWAP) Report For Bisselville Estates

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Bisselville Estates</b>
<b>PWS Address</b>	<b>1109 Washington Rd.</b>
<b>City/Town</b>	<b>Hinsdale, Massachusetts</b>
<b>PWS ID Number</b>	<b>1132009</b>
<b>Local Contact</b>	<b>Jerry Burnet</b>
<b>Phone Number</b>	<b>413-655-8396</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1132009-01G	250	623	Moderate
Well #2	1132009-02G	250	623	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Bisselville Estates wells serve 30 mobile homes and a small, seasonal camping area in the rural town of Hinsdale. This community system is served by on-site septic disposal systems. Both wells are 6-inch diameter bedrock wells and are approximately 100 feet apart. Well #1 is approximately 170 feet deep, with an estimated yield of 16.5 gallons per minute. Well #2 is approximately 182 feet deep, with an estimated yield of 35 gallons per minute. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 250 feet and 623 feet, respectively for each well. These values were assigned based on Title 5 estimated use volumes. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

USGS maps of the area describe the bedrock in the area as gneiss. There is no surficial geology map of the area. There is no record of a confining, protective clay layer in the vicinity of the wells. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The wells serving the facility have no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the wells and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Nonconforming use in Zone I;**
2. **Low density housing and septic system;**
3. **Above-ground Storage Tanks; and**
4. **Electrical Transformers.**

The overall ranking of susceptibility to contamination for the well is moderate, based on more than one moderate threatening land use or activity in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming use in Zone I** - The Zone Is for both wells are nonconforming with respect to DEP land use restrictions that allow only water supply related activities in the Zone I. The public water supplier does not own and/or control all land encompassed by the Zone I of the well. An old cemetery owned by the town is in both Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Low Density housing	Both wells	Both wells	Moderate	Refer to septic system brochure
Roadways	Both wells	Both wells	Moderate	Prohibit parking along road
Electrical Transformers	Both wells	Both wells	Moderate	Request information regarding PCB in MODF change from your electric company
Cemetery	Both wells	Both wells	Moderate	Last interment in late 1920's
Above-Ground Storage Tanks	No	Both wells	Moderate	Upgrade old tanks, maintain existing tanks, and encourage conversion to propane

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Consider raising the wellhead for well #2, as it is located below grade. Secure both wells with watertight sanitary caps, and seal any cracks in the floor.

**2. Low Density Housing --** The Zone Is contain one residence with associated parking, garage, Route 8, and the access road into the park. The IWPA contains the septic system leach field for the entire facility, campsites, and a camping trailer septic pump-out station. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. Another potential threat from residential users is mismanagement of household waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Monitor roadside for spills and leaks.
- ✓ Encourage residents to utilize local household hazardous waste collection days.
- ✓ Supply residents with information about BMPs for household hazardous waste management and lawn care.

**3. Above-ground Storage Tanks (ASTs) --** A kerosene AST for heat and hot water is located within the IWPA at the shower house just outside of the Zone I. This tank is used only during the summer seasonal camping and is therefore only filled approximately 25% of capacity. If managed improperly, ASTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

### Recommendations:

- ✓ Ideally, ASTs in the IWPA should be located in a covered, impermeable containment capable of retaining 110% of the liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ At a minimum, all ASTs older than 15 years old should be replaced and mounted on a concrete pad. They should be maintained with paint.
- ✓ Encourage converting to propane. Provide an incentive, if possible.

**4. Electrical Transformer –** Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some transformers.

### Recommendations:

- ✓ Contact the local utility to determine if the transformers contain PCBs. If PCBs are present, urge their immediate replacement.
- ✓ Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm.

Other activities found during the inspection of the protection areas included hay fields in the IWPA. If the landowner spreads manure or fertilizer on the hayfields or if they switch to other crop harvesting, request that they utilize Best Management Practices for their agricultural practices which include nutrient management. Be sure that they are aware that your facility is a public water supply. If they do not already

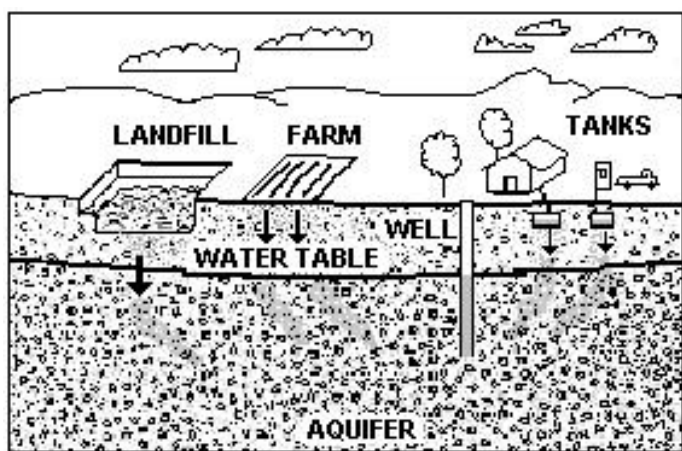


Figure 1: Example of how a well could become contaminated by different land uses and activities.



#### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

have a farm plan, refer them to the Natural Resource Conservation Service. Alternatively, they may follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*. Information on funding and other resources for agricultural management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>

Storage of small amounts of oil and gasoline in the garage for lawn maintenance equipment was also noted during the visit. Provide containment for these items to prevent accidents and leaks within the Zone Is. If possible, store these items outside of the Zone I areas. There is an old cemetery within the Zone Is that has been closed to new interring for over 70 years. Arsenic was used as a preservative during embalming prior to 1910. Although arsenic is a highly toxic heavy metal and may pose a threat to your water supply, there was no arsenic reported in Bisselville Estates' 1999 analytical report.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Bisselville Estates should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Raise wellheads above grade and secure the wellhead by sanitary wellcaps and seal all cracks in the floor.

#### Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ As feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If the facility intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect driveway and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for back-up power sources.

#### Training and Education:

- ✓ Educate staff, residents and tenants about proper hazardous material use, storage, disposal, emergency response, and best management practices.
- ✓ Post drinking water protection area signs at key visibility locations, such as the entrance to the facility.

#### Facilities Management:

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Establish maintenance requirements for ASTs.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.



- ✓ Protective collars around wellheads should slope away from well and casings should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and regulatory requirements, if applicable.

### **Planning:**

- ✓ Work with local officials in Hinsdale to include the Bisselville Estate IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Agricultural:**

- ✓ Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing manure management issues as appropriate.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Small Quantity Generator Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Ashmere Lake Nominee Trust

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 7, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Ashmere Lake Nominee Trust
<i>PWS Address</i>	State Route 143
<i>City/Town</i>	Hinsdale, Massachusetts
<i>PWS ID Number</i>	1132012
<i>Local Contact</i>	Mr. Michael Viner
<i>Phone Number</i>	413-665-7781

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1132012-01G	182	478	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Ashmere Lake Nominee Trust (ALNT) is a two building apartment complex, located on the shore of Ashmere Lake in the town of Hinsdale, a small, rural, hilltown community in western Massachusetts. The facility is located immediately north of State Route 143. Although there is both a municipal water and sewer system in Hinsdale, only the municipal sewer serves this section of town. Therefore, ALNT is served by one water supply well and wastewater is disposed through the municipal sewer system. The buildings house twelve and five apartments, respectively; the system also serves a single family home. The system is served by a single 6-inch diameter, 575-foot deep, bedrock well located approximately 25 feet from the road.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the daily pumped volume from the well, are 182 feet and 478 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Well #1 is located in an area of relatively thin overburden material of till. The bedrock is mapped as the Washington Gneiss, rusty weathering schist with layers of blue-quartz conglomerate and dacite. Although the well has approximately 270 feet of casing, there is no record or evidence of a confining, protective layer such as thick till or clay, in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #1 (01G) include Route 143, the five-unit apartment building of the ALNT complex as well as three residences south of Route 143. The remainder of the complex and numerous homes are within the IWPA of the well.

### Key issues include:

1. **Non-conforming activities within Zone I**
2. **Transportation corridor**
3. **Residential land use**

The overall ranking of susceptibility to contamination for the ALNT supply well (01G) is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells.
High density residential	No	Yes	Moderate	Supply BMPs to residents. Manage the property to prevent refuse disposal, parking and hazardous materials and conditions to exist within the Zone I.
Municipal Sewer	Yes	Yes	Low	Notify the Town if leaks are apparent.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

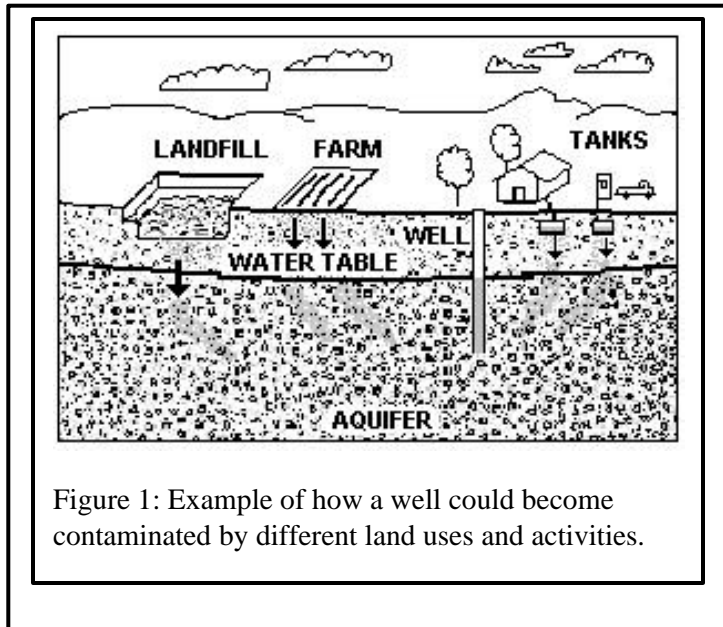


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**1. Non-conforming activities within Zone I** – The Zone I is the area immediately surrounding the wellhead where only activities associated with supplying water or other non-threatening activities are allowed. The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I extends across a public road and includes residences.

**Zone I Recommendations:**

- ✓ Continue to control access to the wellhead area.
- ✓ Consider relocating the well to a more protected area.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Residential Land Use** – There are several residences within the Zone I and the IWPA protection areas. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. The municipal sewer serves the area. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Do not allow the accumulation of refuse within the protection areas under your control.
- ✓ Prohibit vehicle maintenance and the use of hazardous materials within Zone I.

**3. Transportation corridor** – The well is located on a state highway that is the main route through the area. The greatest threat from the road is deicing materials, an accidental spill and or illegal access. Although the well is located within a small structure, it is located within 25 feet of the roadway.

**Transportation corridor Recommendations:**

- ✓ Work with the Town to ensure that road runoff is directed where feasible, to an area downgradient and away from the well.
- ✓ Prepare an Emergency Response Plan that includes coordination between the DEP, the public water supplier, the Town and State Police in the event of an accident near the wellhead.
- ✓ Secure the facilities that the well is in, provide a sanitary seal around the casing to prevent ponding of water and inspect the integrity of the cap and watertight seal regularly.

**4. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

and minimize its susceptibility to contamination. The Ashmere Lake Nominee Trust should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Monitor activities in the Zone I and IWPA areas.
- ✓ Relocate the well if activities cannot be controlled and the water quality is impacted.

### Zone I:

- ✓ Prohibit any new, non-water supply activities from the Zone I.
- ✓ Use BMPs within the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect road drainage in the Zone I away from the well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Protect the well from flooding.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate residents, neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.
- ✓ Manage the property appropriately to prevent hazardous materials and conditions from existing near the well.

### Planning:

- ✓ Request that the town develop a Wellhead Protection District and associated bylaws and request that the IWPA for your and other water systems be include in the protection area.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Suggest that the town review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Copies of this report have been forwarded to the water supplier and Town officials.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Holyoke Water Works**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Holyoke Water Works
<i>PWS Address</i>	20 Commercial Street
<i>City/Town</i>	Holyoke
<i>PWS ID Number</i>	1137000
<i>Local Contact</i>	Mr. David Conti
<i>Phone Number</i>	413-356-0442

### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

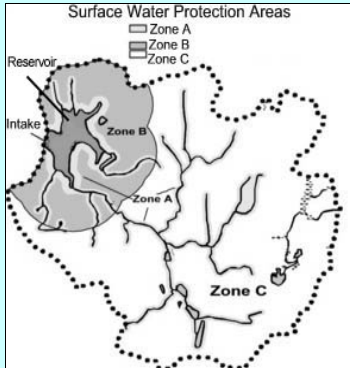
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



### Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### System Susceptibility:

*Moderate*

### Source Name:

### Source ID

### Susceptibility:

McLean Reservoir	1137000-03S	Moderate
Manhan Reservoir	1137000-05S	Moderate

Holyoke Water Works maintains two active reservoirs for their drinking water supply. The Manhan Reservoir (1137000-05S) also known as the Tighe-Carmody reservoir, supplies approximately 95% of the City's water demand. The McLean Reservoir (1137000-03S) provides the balance of the water needs for the Water Works. The Holyoke Water Works maintains a waiver from filtration for both the McLean and Manhan Reservoirs. The Ashley, Whiting and White Reservoirs and the Coronet and Pequot Wells are maintained by the City as Emergency Sources of water. Emergency Sources will not be further assessed in this report.

The watershed for Holyoke Water Works' Manhan Reservoir is located in the Berkshire foothills towns of Southampton, Westhampton, Huntington and Montgomery. The White Reservoir was the main reservoir prior to the construction of the larger, Manhan Reservoir located downstream of the White Reservoir. Presently, the White Reservoir is essentially a flow through reservoir with the dam gates left open. The watershed has steeply sloping hillsides and broader stream valleys. The overburden material consists of till on the dominant uplands and glacially derived stratified drift deposits or recent stream (alluvium) deposits of sand and gravel in the narrow valleys. The bedrock in the watershed is predominantly metamorphosed sedimentary and volcanic rocks of the Waits River Formation and the Goshen Formation with mapped intrusions of the Williamsburg Granodiorite. The structural geology of the eastern part of the Berkshire Massif is described as a complex series of folds and faults. The watershed is 92% forest with the remaining land use residential and agricultural. The Water Works owns approximately 52% of the watershed and another 4% is protected through Town, state ownership or conservation restrictions.

The watershed for the in-town, McLean Reservoir is located entirely in Holyoke along the ridgeline of the Holyoke Range. The topography is steep or sloping with exposed bedrock or thin till covering the bedrock throughout the watershed. The bedrock is composed of the columnar, Holyoke Basalt. The watershed is approximately 99% forest or water while the remaining land area is open land, wetland, residential use or transportation corridor. The Holyoke Water Works owns approximately 73% of the McLean Reservoir watershed. Please refer to the attached map to view the boundaries of the protective zones.

The water from the reservoirs is disinfected with chlorine and chloramines, fluoride is added and the water is treated for corrosion control prior to distribution. For current information on monitoring results and treatment, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies, the sources are considered highly vulnerable to potential contamination. The Holyoke Water Works' active reservoirs are reasonably well protected, in part, because of the remote location and the proactive measures taken by the Water Works, such as ownership or protection of nearly 56%. The overall ranking of susceptibility is moderate based on the presence of at least one moderate threat land use activity in the watershed. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Residential land use
3. Transportation corridors (legal and illegal)
4. Forestry/Watershed Management
5. Protection Planning
6. Utility Line Right-of-Way

**1. Activities in Zone A** - The Zone As for the reservoirs includes all areas within 400 feet of the reservoirs and within 200 feet of either side of all streams that flow into the reservoirs. Land use activities within a Zone A may have an impact on surface water sources. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc., while stormwater run off from roadways can carry other contaminants. There is beaver activity and there are local roads, Route 202, a small parking area, a few residential areas with non-commercial agricultural activities and part of the treatment facility within the Zone A of the system's reservoirs.

### Zone A Recommendations:

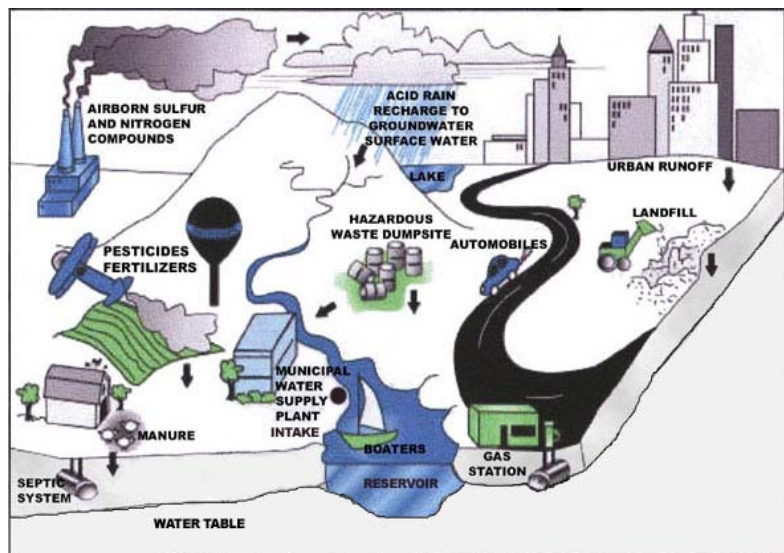
- ✓ Continue to monitor and protect the Zone As. Prohibit new activities from the Zone As.
  - ✓ Continue to monitor activities at the treatment facility to protect the Zone A especially activities associated with chemicals and wastewater at the facility.
  - ✓ Maintain the current practice of wildlife management in the reservoirs and Zone As.
  - ✓ Follow the watershed protection plan for prioritizing land within the Zone As and acquire and/or protect the land as prescribed in the plan. Consider alternatives to fee simple purchase such as Memorandum of Understanding, Right of First Refusal, and Conservation Restrictions.
- 2. Residential land use** – Approximately 70 acres of the Manhan Reservoir watershed consists of residential land uses and approximately 1.0 acre in the McLean Reservoir watershed. Municipal sewers are not available in either watershed, therefore on-site septic systems are used. If managed improperly, activities associated with

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Figure 1: Sample watershed with examples of potential sources of contamination

residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they may be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and surface waters. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.
- **Agricultural activities** – Even non-commercial agricultural activities can pose a potential threat to surface water supplies. The improper management of manure from farm animals and horses may result in contamination of feeder streams.

#### Residential Land Use Recommendations:

- ✓ Continue implementation of the Watershed Resource Protection Plan (WRPP) by providing information to residents regarding best management practices (BMPs) for protecting water supplies. Utilize the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Copies of this report and the technical assistance documents will be forwarded to the Board of Health and Planning Board in the communities within which your water supply protection areas are located. Continue your ongoing efforts to encourage those boards to adopt protection controls in their communities and to provide fact sheets to residents as appropriate.
- ✓ Continue your current practice of reviewing development proposals in the communities that your watershed protection areas are located within and through that process, comment on proposed projects as appropriate, to protect the public water supply. Refer the appropriate boards to the MA DEP website at the following address for information on manure management, pesticide and fertilizer BMPs and other aspects of water supply protection <http://www.state.ma.us/dep/brp/dws/protect.htm>, as applicable.
- ✓ Local Boards of Health and Conservation Commissions should make available to hobby farmers, information about protecting their



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

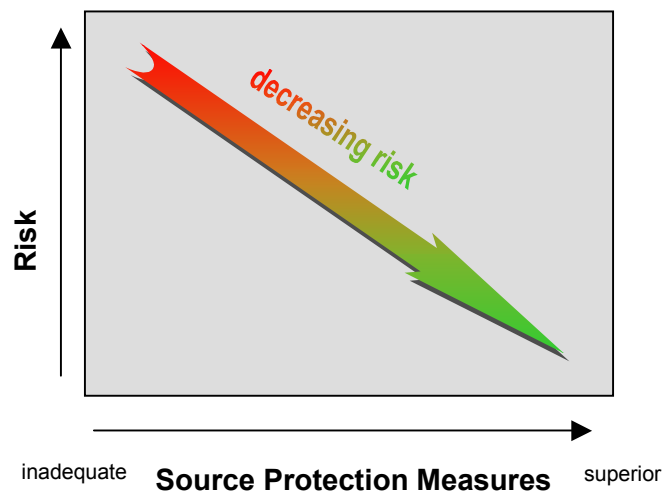


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watersheds**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Land Uses	Quantity	Threat	Source	Potential Contaminant Sources*
<b>Residential</b>				
Fuel Oil Storage (at residences)	Few	M	03S, 05S	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Few	M	03S, 05S	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Few	M	03S, 05S	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aquatic Wildlife	Actively managed	M	All	Microbial and organic contaminants
Domestic Animals/ non-commercial farming	Several	M	05S	Microbial and organic contaminants from manure, possibly pesticides, petroleum products
Clandestine Dumping	Historical	M	05S	Debris containing hazardous materials or wastes
Stormwater Drains/ Retention Basins	Numerous	L	03S, 05S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Right-of-Way	1	L	03S	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors including trails (legal and illegal)	Numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. Erosion and illegal access to water.
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/ or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				



own wells and the public water supply by encouraging the use of BMPs. Board members and land owners should refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for resources.

**2. Transportation Corridors** – There are many local roads located throughout the watersheds of the reservoirs, including many that are dirt roads. A section of State Route 202 runs through the Zone A of the McLean Reservoir. The storm drains along Route 202 through the McLean Reservoir watershed reportedly discharge outside of the watershed. Though most roadways throughout the Manhan Reservoir watershed are low-use, due to the close proximity of some of the roads to the reservoir and Zone A, even typical roadway maintenance and use pose a potentially significant source of contamination from accidents and washouts along the dirt road. De-icing materials, petroleum chemicals, and other debris on roads within the watershed, are picked up by stormwater, discharged into brooks and streams and ultimately into the reservoirs.

There are numerous unpaved, ways as well as legal (authorized) and illegal (unauthorized) trails throughout the watersheds. Most of these roads and trails are not maintained at all or are minimally maintained. The resulting erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, potentially resulting in additional water treatment costs if they continue unchecked. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Access to the reservoirs was observed and anecdotal information indicates evidence of recreating near the reservoirs and throughout the watersheds. Unmanaged access may result in vandalism, illegal dumping and access to the reservoir resulting in water quality impairment.

The Holyoke Water Works has adopted an aggressive watershed inspection and patrol program as part of the watershed protection. Patrols by the Water Works staff and the local police have notably decreased the number of trespassers in the watershed.

#### **Transportation Corridor Recommendations:**

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ As stipulated in the WRPP, continue to inspect stormwater drainage along the local roads and trails in the watershed. As proposed, consider various strategies to detain/slow the flow, redirect runoff out of the watershed or retain/detain sediments from roads within the watershed. If any significant stormwater threats are identified within the watersheds located outside of Holyoke, the Water Works should foster a relationship with the communities to evaluate and mediate those erosion threats. Consider coordinating efforts for work and cost sharing with the local communities on issues potentially impacting the reservoirs.
- ✓ If your on-going work identifies specific trails, roads or ways as sources of erosion or trespassing, continue to evaluate all options for access management. This may include investigating the legal disposition of all roads, ways and “trails” to facilitate efforts to control access in the watershed. Options may include continuing full access, where it may be feasible, closing roads to all traffic, closing roads to all commercial traffic and limiting access only to residents with a locked gate and key for residents only.
- ✓ Continue the aggressive patrols of watershed land and enforce existing policies for no trespassing or limited access on city-owned land.
- ✓ Continue to inspect, maintain, and clean catchbasins or BMPs on a regular schedule as stipulated in the WRPP.
- ✓ Continue to inspect and evaluate existing conditions throughout the watershed

#### **Top 5 Reasons to Develop a Local Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



with respect to current illegal use of watershed land, specifically by ATVs. Determine where access is being gained and what are the destination points and, as noted previously, determine status of the access ways to assist in your strategy to eliminate and/or control access. Other utilities have reported some success in controlling access by increasing no trespassing signage at identified access points and periodically impounding the vehicles of trespassers.

- ✓ Continue working with local emergency response teams to ensure effective management of potential spills.
- ✓ Communities within your watershed may be eligible for USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural Development Manager at the local office in Hadley at 413-585-1000. Board members from rural communities should review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the NRCS office in Amherst 413-253-4350 for assistance and for information. Erosion control is a goal identified in the WRPP; these sources of funding may be able to provide funding for mitigation of stormwater issues to protect the Holyoke Water Works resource.

**3. Forestry/Watershed Management** – The Holyoke Water Work’s WRPP includes a proposal to update the forest management plan as the current plan is outdated. The Water Works Superintendent recently reported that they will be updating and implementing the plan. Logging in a forest without a well-designed plan may result in poor water quality and an unhealthy forest. However, with the use of a properly designed watershed forest management plan and the enforced use of BMPs, forest management may enhance the water production and quality of the raw water. Higher quality raw water can result in reduced treatment cost. Unmanaged forests may result in an even aged forest that is susceptible to fires and disease. Aquatic wildlife such as birds, beavers or muskrats, are currently being managed in the watershed on an as needed basis.

**Forestry/Watershed Management Recommendations:**

- ✓ As discussed in the WRPP, prepare a water supply forest management plan and include in the plan, an evaluation of existing conditions, a forest inventory and forest management plan specifically designed for water supply management. Require the use of BMPs and/or minimize forest roads that may exacerbate public access issues.
- ✓ Continue to implement the WRPP through regular watershed inspections and enforcement of policies. As necessary, exploring aggressive enforcement efforts such as impoundment of off road vehicles and issuance of citations for violators to control the use of ATVs.

**4. Protection Planning** – The Watershed Resource Protection Plan has been updated and the Water Works maintains a waiver from filtration for the Manhan and McLean Reservoirs. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. Currently, the host communities of Westhampton and Huntington do have some protective bylaws in place. However, Southampton and Montgomery do not have Watershed Protection Districts or Bylaws. As noted, the Water Works owns approximately greater than 50% of the watersheds so that they are partially “protected.”

Protection planning should include minimizing the potential threat to the groundwater at the Water Works unused well sites. Those sources, although unused by the Water Works could pose a potential liability and hazard unless managed

properly and the Water Works should continue current efforts to inspect and ensure the well sites are secure.

**Protection Planning Recommendations:**

- ✓ Continue to implement the watershed protection plan and update the plan as necessary. Watershed access, forest management and roads/dirt roads maintenance should be addressed, especially at brook crossings and proximal to the reservoirs. Establish a protection team, and utilize <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Watershed Protection Plan” on ways to include local officials.
- ✓ Encourage local officials to compare local watershed protection controls with current MA Watershed Protection Regulations 310 CMR 22.21(2) and to adopt controls that comply with 310 CMR 22.21(2) if they do not. For more information on DEP land use controls, see <http://mass.gov/dep/brp/dws/protect.htm>.

**For More Information**

Contact Catherine V. Skiba in DEP’s Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

- ✓ Water suppliers already have established a protocol to be made aware of major developments and projects proposed for communities within which the watershed is located. As development pressures increase in hilltown communities, small, residential developments may also increase. When locals boards notify the Water Works of projects in the watershed, continue your current practice of reviewing and commenting on those plans as appropriate.
- ✓ Continue to implement the land acquisition strategies set forth in the WRPP and consider alternative, less costly strategies to a fee simple purchase of land. Consider negotiating a Memorandum of Understanding, Right of First Refusal agreement or purchasing conservation restrictions for land not currently owned by the Water Works.
  - A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU. An MOU should be recorded on the property deed.
  - A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. See Right of First Refusal in the Appendices.
  - Purchasing the development rights on land is equivalent to paying to apply Conservation Restrictions or Easements. This option allows the land owner to retain ownership of the land but limit usage on some of the land. This is a legal document that can be executed in various forms.

**5. Utility Line Right-of-Way** – A natural gas line runs through the McLean Reservoir watershed. Normal maintenance of a right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on a right-of-way is a potential source of contamination. Leaks or spills of chemicals used for maintenance of the line are also potential sources of contamination to the water supply.

**Right of Way Recommendations:**

- ✓ Review the right-of-way Yearly Operating Plan (YOP) from the utility company to ensure it has accurate information regarding the locations of the Zone A and that only mechanical methods are used for vegetation control. If the utility has not provided the Water Works with a copy of the YOP, they may have sent it to the Holyoke Conservation Commission. Review, or request that the Conservation Commission review the maps the utility uses for accuracy. If the maps are not accurate, provide them with maps from your records. The Water Works should only need to do this one time and it may be accomplished by sending a copy of the watershed map to the utility. It is the responsibility of the utility to comply with regulations governing vegetation control in rights-of-way.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Preparing and implementing a Watershed Resource Protection Plan.
- Actively pursuing watershed protection throughout hiring staff to conduct inspections, control wildlife activities and enforce watershed rules.
- Previous efforts to purchase and protect watershed land critical to protection of the reservoir.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue to implement the WRPP and update the plan as milestones are achieved or changes occur in the watershed.
- ✓ Continue to implement the land acquisition and protection strategy as outlined in the WRPP. Consider alternate strategies to fee simple land purchase to protect critical land near the reservoirs and feeder streams.
- ✓ Continue inspection of the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue efforts to control access to the watersheds, through patrols, public education and controlling watershed access points.
- ✓ Continue the education of residents on ways they can help you to protect drinking water sources.
- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of best management practices for residential and recreational uses.
- ✓ Encourage the communities of Westhampton, Southampton, Huntington and Montgomery to adopt water supply protection bylaws/regulations, to provide information to residents regarding the use of BMPs and to encourage residents to participate in local household hazardous waste collection days.
- ✓ Develop and implement a Forest Management Plan for water supply protection.
- ✓ Review stormwater management and access management on ways closest to the reservoirs and feeder streams.

### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection efforts. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

The Massachusetts Department of Food and Agriculture's Agricultural Environmental Enhancement Program (AEEP) provides funding to farmers to install a variety of water quality protection practices. For more information on the program contact the coordinator, Susan Phinney, at (617) 626-1772, [Susan.Phinney@state.ma.us](mailto:Susan.Phinney@state.ma.us).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to update your long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>YES</b>	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with “Public Drinking Water Supply” Signs?	<b>NO</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue inspections of drinking water protection areas. Increase frequency when possible. Investigate access controls.
Are water supply related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone A and throughout watershed.
<b>Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)</b>		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20 C?	<b>YES</b>	Holyoke has protective ordinances and erosion control ordinances.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Request that Planning Boards, Boards of Health and/or Conservation Commissions consider adopting protection controls within the watershed. Consider providing examples of Holyoke’s Erosion Control Ordinance to communities.
<b>Planning</b>		
Does the PWS have a local Surface Water Protection Plan?	<b>YES</b>	Review and update the plan as necessary. Continue efforts to establish and update a forest management plan, inspect erosion controls and access issues. Follow “Developing a Local Surface Water Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws">www.state.ma.us/dep/brp/dws</a> for guidance on how to include local officials in protection strategy.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>Partial</b>	Continue working jointly with emergency response teams including fire and police departments, local Boards of Health, and local and state emergency officials. Continue to coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	<b>NO</b>	Consider establishing a committee and include representatives from citizens’ groups, neighboring communities, and the business community as is appropriate to assist in protection of the watershed land.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide watershed protection education?	<b>YES</b>	Continue providing education at schools and include boards of communities within the watershed.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for

## Huntington Water Department

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Huntington Water Department
<i>PWS Address</i>	Route 20, P.O. Box 301
<i>City/Town</i>	Huntington
<i>PWS ID Number</i>	1143000
<i>Local Contact</i>	Mr. Bernard St. Martin
<i>Phone Number</i>	413-667-8861

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**System Susceptibility;**

High

**MA GIS Zone II ID: # 464**

**Susceptibility: High**

Well Names	Source IDs
Well #1	1143000-01G
Well #2	1143000-02G

The Town of Huntington is primarily an agricultural and rural residential community in Western Massachusetts. The Water Department owns and maintains two groundwater supply wells and a reservoir. The reservoir is maintained as an Emergency source only and is not assessed in this report. There are two wells serving the Water Department of Huntington (1143000-01G and 1143000-02G). The source was initially developed in 1930 as a tubular series of six shallow, 2½-inch diameter wells, which were replaced in 1978 with two, 8-inch diameter, gravel developed wells, 50 feet apart and approximately 43-feet and 40-feet deep, respectively. The two wells have a combined, approved withdrawal rate of 300 gpm. The wells are located within the shallow bedrock valley of the West Branch Westfield River, that was filled with glacial and later alluvial sand and gravel. There is no evidence of a confining (protective) clay layer in the vicinity of the well. Wells located in an unconfined aquifer are considered to have a high vulnerability to potential contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration into the aquifer from the surface. Each of the wells has a Zone I protective radius of 400 feet. The Zone II recharge area for the wells was delineated as part of the SWAP program utilizing empirical data developed during an extended duration pumping test, analytical modeling and hydrogeologic mapping. The wells are located immediately southeast of the Chester town line and the Zone II is almost entirely in the town of Chester. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Huntington adds sodium carbonate for pH adjustment and polyphosphate to the water for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The land uses in the Zone II area of Huntington's wells consist primarily of residential and agricultural uses (refer to attached map for details). Land uses and activities that have been identified as issues of concern are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Agricultural activities
5. Hazardous waste generator
6. Right of Way: Electric and Railroad



The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for each well is a 400-foot radius around the wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The Water Department does not own the entire Zone I radius; there are activities such as a railroad track and roads within the Zone I.

#### Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements and continue to monitor those that cannot be removed.
- ✓ Continue current use of BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Investigate and enter into an agreement of right-of-first refusal for the potential future purchase of the Zone I land or a conservation restriction to control any future activities within the Zone I land as feasible.

**2. Residential Land Uses** – Approximately 6% of the Zone II consists of residential areas. Huntington does not have a public sewer; therefore, all residences are assumed to use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals

to septic systems is a potential source of contamination to the groundwater because septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

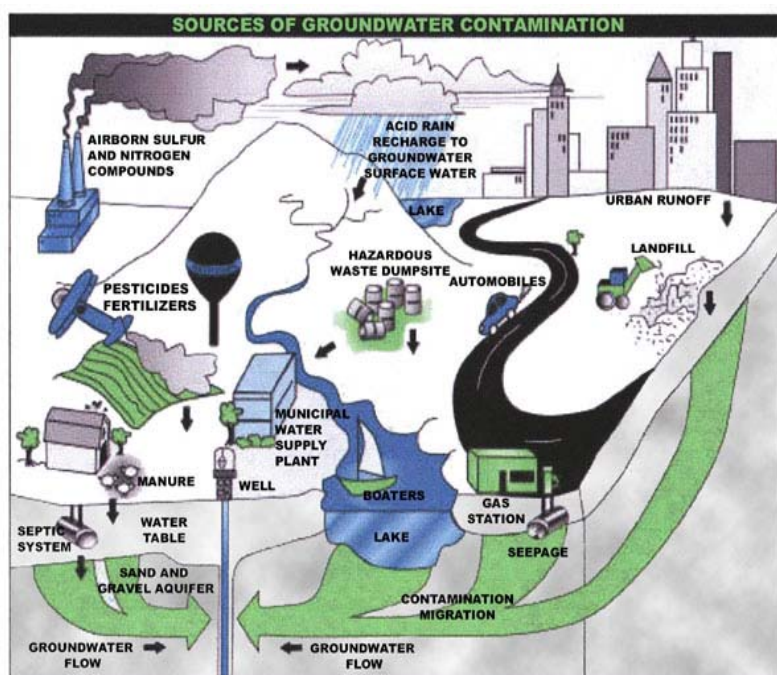
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Storm Drain Stenciling Program - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. For information on DEP’s Nonpoint

Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>
- ✓ Notify town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the

(Continued on page 6)

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### **For More Information**

Contact Catherine Skiba in DEP’s Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

#### **Source Protection Decreases Risk**

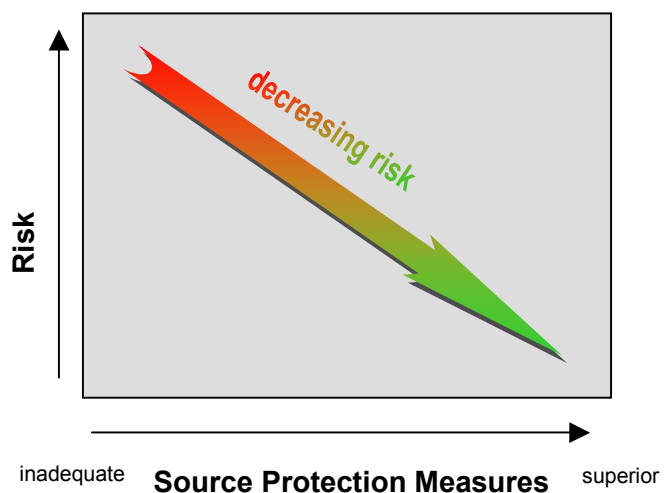


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Zone II	Threat*	Potential Source of Contamination
<b>Agriculture</b>				
Fertilizer Storage or Use	Several	Yes	M	Fertilizers: leaks, spills, improper handling, or over-application
Farm animals (hobby)	1	Yes	M	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	Several	Yes	M	Manure (microbial contaminants): improper handling
Crops	1	Yes	M	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	Several	Yes	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Miscellaneous</b>				
Railroad Tracks	1	Yes	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Hazardous Materials Storage (registered—Zone III and unregistered Zone II)	2	Yes	H	Hazardous materials: spills, leaks, or improper handling or storage
Illegal junkyards (Just outside of Zone II)	1	-	-	Debris containing hazardous materials or wastes
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	Yes	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	Yes	M	Pesticides: over-application or improper storage and disposal
Septic Systems	Numerous	Yes	M	Hazardous chemicals: microbial contaminants, and improper disposal

Activities	Quantity	Zone II	Threat*	Potential Source of Contamination
<b>Miscellaneous</b>				
Transmission Line Rights-of-Way	2	Yes	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Several	Yes	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
<b>Notes:</b> <ol style="list-style-type: none"> <li>1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.

**4. Agricultural Activities** – Croplands and pasture lands make up 6% of the land uses in the Zone II. There are corn and hayfields in the Zone II, as well as blueberry orchards. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. There are several agricultural uses in the Zone II. If they are commercial facilities Department of Food and Agriculture and the US Natural Resources Conservation Service can provide technical assistance and potential funding to assist them. If they are hobby farmers, provide them with information available from DEP on BMPs.

**Agricultural Activities Recommendation:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Notify hobby farmers that they are within the Zone II and provide information on BMPs or refer them to the DEP, Farm Bureau or Conservation District for assistance.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ex.4.

**5. Hazardous Waste Generator** – Due to their daily operations at some facilities, very small quantities of hazardous waste are generated. Banish Lumber (which is outside of the Zone II but within the Zone III) has appropriate permits, and they contract with a licensed hauler to remove the hazardous waste. Hazardous waste is a potential source of contamination if it is improperly handled or stored. There is however a small business within the Zone II that may be a very small quantity generator of regulated hazardous materials but is not registered.

**Hazardous Waste Generator Recommendation:**

- ✓ Inform businesses of their proximity to the Zone II and encourage businesses to maintain their current good practices to handle hazardous waste in compliance with regulations. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.



- ✓ There is at least one small business located in the Zone II that appears to use and store hazardous materials such as petroleum that is currently not registered as a generator of hazardous waste or waste oil. Request that the Chester Board of Health review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and visit the facility to help them determine their status and regulatory requirements. Enclosed is a registration form for you to supply to the Board of Health.

**6. Right-of-Ways** – The railroad and an electricity right of way run through the Zone II. Rail corridors that serve passenger and/or freight trains are a potential source of contaminants due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of any right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on right-of-ways is a potential source of contamination. Leaks or spills of transported chemicals or train/track maintenance chemicals are also potential sources of contamination to the water supply.

**Railroad Right of Way Recommendations:**

- ✓ Continue your current practice of reviewing the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the protection zones. Review the maps the utilities use.
- ✓ Notify Western Massachusetts Electric Company of the right-of-way within the Zone II of your source. Supply them with accurate maps and request notification from the utility should they resume use of the right-of-way. Review the right-of-way Yearly Operating Plan from the electric company, and request their continued use of Best Management Practices with regard to vegetation control on the right-of-way in the Zone II.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the railroad right-of-ways including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate Emergency

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - Increased groundwater monitoring and treatment
  - Water supply clean up and remediation
  - Replacing a water supply
  - Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

**Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce

*(Continued on page 8)*

the risk of actual contamination, as illustrated in Figure 2. The Huntington Water Department is commended for their proactive stance on water supply protection demonstrated by the following:

- Detailed knowledge of activities in the protection areas and active monitoring
- Applying for Wellhead Protection Grants
- Constructing a building to contain hazardous water supply chemicals
- Preparing a Wellhead Protection Plan
- Fencing the wellheads

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue educating residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with abutting communities and local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Supply BMPs to land owners that are hobby farmers to control, fertilizer, pesticide and manure management.
- ✓ Make regular updates to the Wellhead Protection Plan.
- ✓ Continue efforts of working with Chester's Town Boards

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. As you are aware, the Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

#### **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix



The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Registered Facilities within the Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	When possible, purchase Zone I lands, pursue conservation restrictions, or otherwise work to keep non-water supply activities out of the Zone Is.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning By-laws/Ordinances, Health Regulations, and General By-laws/Ordinances)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>YES</b>	Huntington does have controls that meets DEP’s requirements for wellhead protection.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Continue working with Chester to prepare and bring to Town Meeting wellhead protection controls through Zoning or Health regulations and include the Huntington Zone II.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	Implement tasks identified in the wellhead protection plan and update the plan as required.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Develop a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams in Chester.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Continue with the committee to implement to plan; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim efforts at residential, commercial, and municipal uses within the Zone II.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
KNIGHTVILLE DAM WATER SYSTEM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Knightville Dam Water System
<i>PWS Address</i>	39 Knightville Dam Road
<i>City/Town</i>	Huntington, Massachusetts
<i>PWS ID Number</i>	1143011

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1143011-01G	165	460	High	Moderate
Well #2	1143011-02G	100	401	High	Moderate
Well #4	1143011-03G	100	413	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

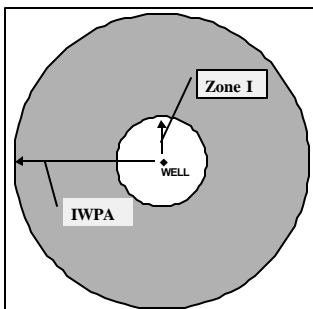
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1143011-01G)**

Zone I = 165 ft.  
IWPA = 460 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic leach fields within the Zone Is and the IWPAs of the wells. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone Is and the IWPAs.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, Annual Statistical Reports, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
NORWICH LAKE FARM LOWER SYSTEM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
Revised  
April 20, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	NORWICH LAKE FARM LOWER SYSTEM
<i>PWS Address</i>	87 SEARLE RD
<i>City/Town</i>	HUNTINGTON, MASSACHUSETTS
<i>PWS ID Number</i>	1143013

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1143013-01G	268	693	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

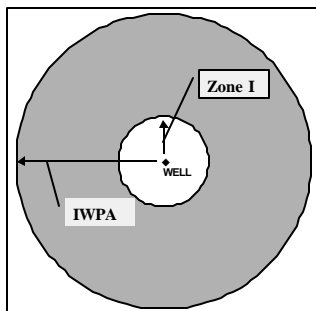
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1143013-01G)**

Zone I = 268 ft.  
IWPA = 693 ft.



## How Was my Well's Susceptibility Determined?

Well #1's **high** susceptibility to potential microbial threats is based on the presence of septic system components within the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
NORWICH LAKE FARM UPPER SYSTEM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
April 20, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Norwich Lake Farm Upper System
<i>PWS Address</i>	87 Searle Rd
<i>City/Town</i>	Huntington, Massachusetts
<i>PWS ID Number</i>	1143014

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #2	1143014-01G	178	473	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

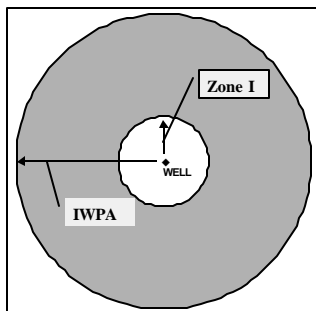
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #2  
(1143014-01G)**

Zone I = 268 ft.  
IWPA = 693 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I / IWPA. The **high** susceptibility to potential non-microbial threats is based on the agricultural activities within the Zone I and/or the IWPA. Other moderate threats include local roads within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
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Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Lanesborough Fire & Water District**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Lanesborough Fire & Water District
<i><b>PWS Address</b></i>	Bridge Street, P.O. Box 1504
<i><b>City/Town</b></i>	Lanesborough
<i><b>PWS ID Number</b></i>	1148000
<i><b>Local Contact</b></i>	Mr. Theodore Nylic
<i><b>Phone Number</b></i>	(413) 499-5916

### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

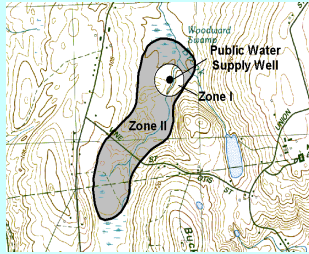
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

### System Susceptibility

**High**

**Zone II #: 476**

**Susceptibility: High**

Well Names	Source IDs
GP Well #1 Bridge Street	1148000-01G
Well #2 Town Brook (Miner Road ) Well	1148000-02G

The town of Lanesborough is a small, rural community in northwestern Massachusetts. Lanesborough was settled in the mid-1700's and developed into a small industrial and agricultural community in the 1800's. The Town is bordered on the east by part of the Hoosac Range and on the west by Potter Mountain of the Taconic Range. The ranges meet at the northern end of town through a series of lesser hills at the base of Mt. Greylock. Lanesborough is primarily within the Housatonic River valley with the southeast corner within the Hoosic/Hudson River valley. The town developed primarily in the valley that widens slightly to the south of town toward Pittsfield. Today, Lanesborough is predominantly rural and residential with the main development along Route 7. The Lanesborough Fire & Water District (the District) maintains two active water supply wells GP Well #1 Bridge Street Well (01G) and Well #2 (02G) Town Brook (Miner Road) Well.

Well #1 is a 12 x 18-inch diameter, gravel packed well, 52 feet deep installed in 1954 and is used as a back-up or supplemental source. Well #2, used as the main supply, is an 18 x 24-inch diameter, gravel packed well, approximately 57 feet deep installed in 1964. In 1997, Well #2 was rehabilitated due to a deteriorating screen and pump; a new 12-inch diameter screen was inserted in the original 18-inch screen with gravel installed between the new 12-inch and the original 18-inch screen. Wells #1 and #2 are located within the same, relatively narrow, unconfined, sand and gravel aquifer, along the Town Brook valley, west of Route 7. Since they are located within the same hydrogeologic regime, they also share the same Zone II contribution area, although Well #2 is located 4,600 feet downgradient from Well #1. The Town Brook aquifer is a semi-confined, (leaky-confined) sand and gravel aquifer.

The Town Brook aquifer is a glacially deepened, bedrock valley that was filled in with sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 years ago. Streams and rivers have reworked and eroded the glacial deposits and recent streams have deposited additional alluvial material. Boring logs, seismic data and maps of the valley area indicate fine to coarse sand and gravel deposits approximately 50 to 60 feet deep and in some areas up to 70 feet in depth. These deeper areas within the valley may be due to karst sinkholes in the bedrock. Boring log and seismic data indicate the silt and clay confining layer is discontinuous along the edges of the southern reaches of the valley and pinches out, even in the center of the valley north of Miner Road just south of Putnam Road. Therefore, the aquifer responds as a confined aquifer at Well #2 initially, but over time, the area of contribution, expands to the unconfined portion of the recharge area. Well #1 (Bridge Road Well) is in an unconfined portion of the aquifer with no protective clay layer. The clay layer was deposited during the glacial recession when a dam was formed blocking the melt water flow and causing the formation of a temporary lake; the clay layer represents the



lake bottom sediments. Eventually the dam was breached and the lake drained. The effect of this hydrogeologic regime is that although the aquifer may be protected from some land uses immediately adjacent to the confining clay layer, the aquifer is vulnerable to contamination from activities conducted in the unconfined portions of the recharge area.

The bedrock in the area is a complex series of folded and faulted metamorphic rocks predominantly Berkshire schist in the highland and carbonate rocks of the Stockbridge group and quartzite in the valley floor and valley walls. A northerly plunging anticline lies beneath the valley floor. The Kitchen Brook dolomite is mapped along the southern portion of the valley at Well #1 and the Claredon Springs dolomite is mapped in the vicinity of Well #2; the Bascom formation dolomite is mapped north of the Claredon Springs formation. There is also a high angle reverse fault trending NNE/SSW along the western edge of the valley. It is speculated that the bedrock aquifer, as well as the overburden (water table) aquifer, may contribute considerable recharge to the aquifer under pumping conditions.

Each well has a Zone I protective radius of 400 feet immediately around the wellhead. The Zone II was delineated through the SWAP program by consultants for the Department utilizing geologic mapping and analytical modeling. Data for the analysis were gathered from extended duration pumping tests, boring logs and previous studies. The aquifer is considered to be highly vulnerable to contamination from activities conducted on the ground surface due to the absence or discontinuous nature of the hydrogeologic barriers (i.e. clay) that can prevent contaminant migration from activities on the land surface. Please refer to the attached map to view the boundaries of the Zone II.

The water is not currently treated but there is a stand-by chlorinator available if the need should arise to disinfect the water. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

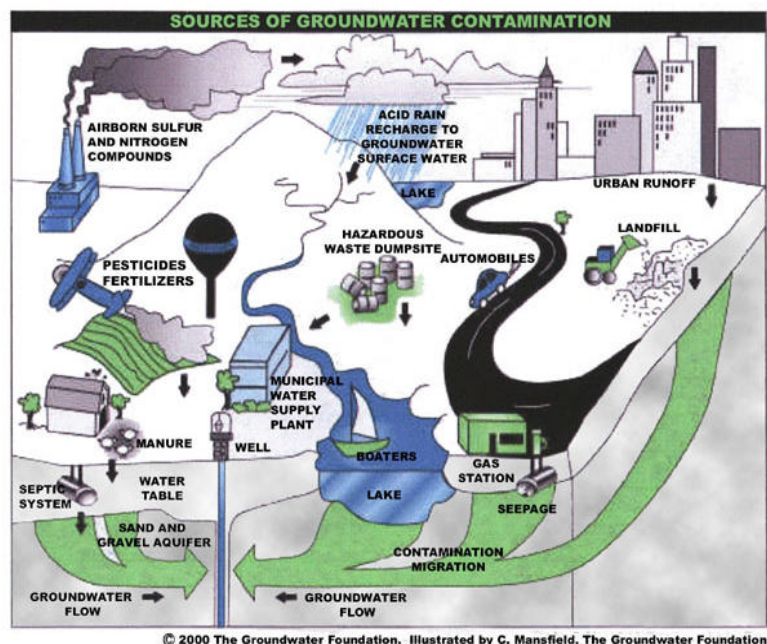
Contact your regional DEP office for more information on Source Protection and the Waiver Program.

## Section 2: Land Uses in the Protection Areas

The land use within the Zone II of the Lanesborough Fire & Water District wells is a mixture of open land, wetland, forest, cropland, and residential, with a small portion of commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Hazardous materials storage and use



4. Transportation corridors
5. Agricultural activities
6. Confirmed hazardous waste release sites
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Currently, the Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction, Memorandum of Understanding or other legal mechanism as approved by the DEP. The public water supplier does not own or control the entire Zone I for either of the wells. Only activities directly related to the water supply, or other non-threatening activities, as determined by the DEP, are allowed in the Zone I. Transportation corridors, and a portion of a farm are within the Zone Is. Numerous water sources were developed prior to the 400-foot Zone I requirement and are therefore grandfathered. The Department encourages grandfathered systems to acquire ownership or control of the Zone I. Activities within Zone Is are as follows:

**Well #1 Bridge Street Well (01G):** The District office, the District's garage, the tight tank for the bathroom and portions of a residential yard are all located within the Zone I of Well #1. The access road is not paved and there are floor drains in the garage that discharge to the ground. Vehicles, equipment and supplies, including small quantities of hazardous materials are stored in the garage. Although small quantities of hazardous materials (petroleum products) are stored in the garage, according to the District, there is no regular maintenance conducted on the vehicles at the garage. Hazardous materials that are improperly stored, used, or disposed, become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain or allowed to spill directly to the ground. Floor drains located in areas that have the potential for hazardous materials to discharge to the ground are illegal. The DEP has required the District to address the floor drains and DEP recommends that the District develop a plan for hazardous materials handling for all equipment and materials that will remain in the garage. Vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

**Well #2 Miner Road Well (02G):** Miner Road is located within the Zone I of the source. The District applied for and was awarded a source water protection grant to fund the installation of a sedimentation basin and other Best Management Practices (BMPs) as part of a road improvement project conducted during 2001.

#### **Zone I Recommendations:**

- ✓ Remove all petroleum/hazardous products from the Zone I. Any products required to be on-site should be stored in containment and handled with extreme care and a management and spill control plan should be prepared.
- ✓ Address the floor drains in the garage in accordance with DEP requirements. Floor drains must either be seal in accordance with DEP regulations and procedures or connected to the tight tank. Inspect the garage floor to prevent accidental release to the ground and have emergency response and spill cleanup materials on hand.
- ✓ As part of the long term planning for the District, consider the feasibility of relocating the District garage.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Continue your current efforts to purchase land and/or negotiate a conservation restriction for land

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### **Source Protection Decreases Risk**

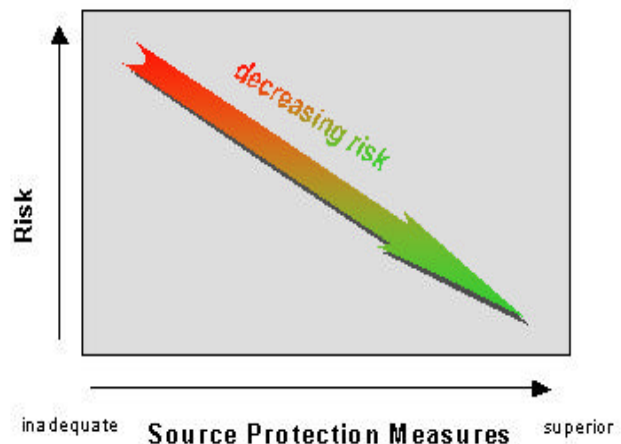


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agriculture</b>			
Fertilizer/Pesticide Storage or Use	2	M/H	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations (non-commercial)	5	M	Manure (microbial contaminants): improper handling
<b>Residential</b>			
Fuel Oil Storage (residential)	Numerous	M/H	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Commercial</b>			
Gasoline Station	1	H	Materials stored in tanks: spills, leaks, or improper handling
Cemetery	1	M	Lawn fertilizers/pesticides, embalming
Service station/body shop	2	H	Hazardous materials: spills, leaks, or improper handling
Highway maintenance depot	1	M	Hazardous materials: spills, leaks, or improper handling
<b>Miscellaneous</b>			
Underground Storage Tanks	5 confirmed	H	Releases of products, spills, overfills
Transportation Corridors	Numerous	M	Corridor maintenance with pesticides, stormwater runoff, accidental release of hazardous materials
Confirmed Hazardous Waste/Oil Release Sites	2	**	RTN 1-12693, 1-000789, (1-0000106—RAO)
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Aboveground storage tanks	1	M	Spills, accidental release

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Miscellaneous</b>			
Furniture Stripping	1	H	Solvents: spills, leaks, or improper handling
Very Small Quantity Generators	2	L	Stored materials: spills, leaks, or improper handling
Transformers	Several	L	MODF and possibly PCBs: spills, leaks, or improper handling. Contact the electric company to ensure no PCBs are within the transformers.

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the protection areas may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

within the Zone I.

- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.

- A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of fields within the Zone I would not have manure, fertilizers

or pesticides spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

- A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.



The Department recommends that the Water Department establishing a program for planning to acquire ownership or control of property within the areas critical to protecting water quality. If there is no other reasonable method to secure rights and protect these sources, the District may wish to consider taking necessary water supply land by eminent domain to protect the sources. This recommendation is not only for the existing sources but also should be considered for future development of sources if they are needed.

**2. Residential Land Uses** – Approximately 19% of the Zone II land use consists of residential areas. The Zone II area is not connected to municipal sewer and therefore utilize on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Inventory the Zone II for residential USTs and outdoor ASTs. Encourage homeowners to provide containment for ASTs and remove USTs. Consider ways to partner with homeowners to encourage UST removal if you find that there are any residential USTs within the protection areas.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - Increased groundwater monitoring and treatment
  - Water supply clean up and remediation
  - Replacing a water supply
  - Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**3. Hazardous Materials Storage and Use** – Six percent of the land area within the Zone II is commercial land use. The District garage is located within the Zone I of the Bridge Street Well and small quantities of hazardous materials are stored in the garage, in containment. A gasoline station, the Fire Department, Police Department and Highway Department and several businesses that handle hazardous waste or materials are located within the Zone II. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. As you are keenly aware, hazardous materials that are improperly stored, used, or disposed, become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain or allowed to spill directly to the ground. As noted in Item 1.—vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ All hazardous materials should be removed from the garage and any that must remain should be stored in containment and used with caution to prevent an accidental release.
- ✓ Coordinate with the Fire Department to inventory all USTs and ASTs in the Zone II and Zone III areas. Consider developing a strategy to minimize the risk from hazardous materials stored in the protection areas. This may include a

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

hazardous materials use and storage regulation in town and cost sharing for the removal of USTs.

✓ Continue current efforts to educate and work with local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.

✓ Work with local businesses to ensure that the District is included in their emergency response plans for notification of any release that may impact the groundwater or surface water of the Town Brook. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

✓ Educate and assist the community on promulgation of a hazardous materials handling and floordrain regulation and inspection program. Refer to the brochures regarding “Industrial Floor Drains” and Hazardous Waste Handling for more information.

**4. Transportation Corridors** - State highways and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other

potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catchbasins. The final stormwater mitigation design on Miner Road was an improvement at that location.

#### **Transportation Corridors and Stormwater Recommendations:**

- ✓ Identify stormwater drains and the drainage system along all transportation corridors. Wherever possible, ensure that storm drain systems discharge stormwater outside of the Zone II. If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. Request that the MA Highway Department provide a copy of the storm drain plans for Rt. 7 to the local emergency response team.
- ✓ Contact the Town and State to ensure catchbasins are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ Communicate with the Highway Department regarding all maintenance and stormwater improvements within the Zone I of the Miner Road well.
- ✓ Actively participate in and communicate with the Lanesborough Highway Department and the State Highway Department to ensure the use and maintenance of BMPs to protect the aquifer. Ensure that the state and local highway departments know the Zone II boundary to assist them in the proper design of BMPs.

**5. Agricultural Activities** – There are several farms (hobby, hay and crops) and agricultural activities (haying and non-commercial animals) throughout the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water supplies. In addition, farms and large commercial facilities often conduct their own maintenance on their equipment and have storage of hazardous materials and waste. There are several non-commercial (hobby) farms within the Zone II and Zone III areas.

#### **Agricultural Activities Recommendation:**

- ✓ If appropriate, work with the Department to negotiate a Conservation Restriction or Memorandum of Understanding for activities on farm land.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Pittsfield at (413) 443-6867 ext. 3 for assistance.

- ✓ Encourage farmers and property managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with farmers, and include nurseries to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff. Farmers should be aware that state and federal regulations govern the use of pesticides in Zone II.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs especially with regard to manure management. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**6. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0012693 and 1-0000789. Refer to the attached map and Appendix B for more information. A Release Action Outcome statement (RAO) indicating the site has been remediated was recently submitted for the site 1-0000106. Another site, 1-0012693, is been classified as a default Tier 1B site with the owner having established financial inability to remediate the site. The DEP has conducted some state funded clean-up actions at the site but additional work is required. Please refer questions to the Bureau of Waste Site Cleanup at the Springfield Regional Office of the DEP at (413) 784-1100.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Continue to participate in the monitoring of progress and commenting on the ongoing remedial action conducted at the confirmed release sites.

**7. Comprehensive Wellhead Protection Planning** – Currently, the Town of Lanesborough has water supply protection controls. However, they do not meet the minimum requirements of the Department's Wellhead Protection regulations 310 CMR 22.21(2). The Zone II report detailed recommendations for modifying the bylaws to be in compliance with 310 CMR 22.21(2). A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Activities within the Zone III may also pose a potential threat to the water supply. Specifically, under pumping conditions Town Brook contributes water to the aquifer. If stormwater, farm runoff or other accidental releases occur to the brook, they may pose a threat to water quality. This report does not include facilities located within the Zone III except the gasoline station. Please inventory activities along Rt. 7 to be aware of all potential threats.

**Protection Planning Recommendations:**

- ✓ Inventory facilities within the Zone III and incorporate any potentially high threat facilities into your Emergency Response Action Plan such as the gasoline stations and auto repair facilities that may be just outside of the Zone II or within the Zone III.
- ✓ Consider preparing a Wellhead Protection Plan. Establish a protection team that includes participation from Town officials and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Refer the Planning Board to the recommendations detailed in the Zone II report for modifications to the local bylaws and regulations. Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2) to adopt controls that meet requirements of that regulation. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>. The Department can assist you in these efforts.

- ✓ Local controls do not regulate floordrains; request that the Board of Health adopt floordrain controls and hazardous materials handling regulations.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Proactively pursuing funding to improve stormwater controls in the Zone I,
- Working with the Planning Board to adopt protective zoning bylaws to the town. Please continue that effort by requesting that the Planning Board adopt the recommendations included in the SWAP Zone II report and this report.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities; remove all hazardous materials from the Zone I.
- ✓ Continue monitoring the hazardous release sites in and adjacent to the Zone II.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue working with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Consider inventorying USTs within the Zone II and Zone III.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant

Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. If funds are available each spring DEP posts a new Request for Response for the grant program (RFR).

#### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source



protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Areas
- C. Confirmed Hazardous Materials/Oil Release Sites
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction, Memorandum of Understanding and other forms of protection. Work with the DPW when they are proposing work in the Zone I.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Prohibit other land uses within the Zone Is. Address the issues at the District garage related to the floor drains, hazardous materials handling and storage, and vehicle parking. Continue working with land owners to negotiate a Conservation Restriction and other forms of protection.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>PARTIAL</b>	Modify protection measures as appropriate to fully comply with regulation.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Prepare a plan following "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment the plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> Work with neighboring communities to adopt floor drain regulations and work with industries to protect water supplies.
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II and, as appropriate, Zone III.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
THE BROOK PUB & GRILL



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	The Brook Pub & Grill
<b>PWS Address</b>	55 Williamstown Rd
<b>City/Town</b>	Lanesborough, Massachusetts
<b>PWS ID Number</b>	1148010

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1148010-01G	126	433	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

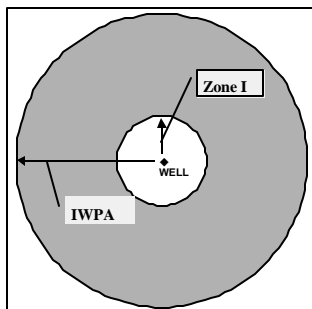
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1148010-01G)**

Zone I = 126 ft.  
IWPA = 433 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The system disinfects the water prior to distribution. The **moderate** susceptibility to potential non-microbial threats is based on the parking and local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Berkshire Spring**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Berkshire Spring
<i>PWS Address</i>	Summer Street
<i>City/Town</i>	Lanesborough
<i>PWS ID Number</i>	1148015
<i>Local Contact</i>	John Olander
<i>Phone Number</i>	(413) 442-1167

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Section 3 for recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments

## Section 1: Description of the Water System

**Zone II #: 595**

**Susceptibility:** Moderate

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Well Names	Source ID
Spring #1	1148015-01G

Berkshire Spring is a spring located on Summer Street in the town of Lanesborough, a rural, small town in Berkshire County. Berkshire Spring receives its water from one (groundwater) spring source. The source supplies water to the general public through a free flowing tap located along the side of the road, to several private homes north of Summer Street and to the public water system Berkshire Village Cooperative (1148001). Berkshire Village Cooperative water system supplies water to 32 residences, one business and two churches. Spring #1 is located south of Summer Street, approximately 300 feet west of the intersection with Old State Road in Lanesborough, Massachusetts.

The source is a spring vault located at the base of a hill with some evidence of thin sand and gravel deposits overlying bedrock noted in nearby outcrops. The USGS, as part of the SWAP program, delineated the Zone II area of contribution to the spring and identified the contributing source as the dolomite bedrock. The Zone I is the area immediately surrounding the source. Spring #1 has a Zone I area that is square shaped with each side measuring 800 feet in length and oriented in the direction of groundwater flow. The Zone II area extends south along a bedrock ridge. Flow from the source is estimated to be greater than 50 gallons per minute. The spring is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay). Although there is evidence of some overburden, there are also numerous bedrock exposures in the Zone II area. Please refer to the attached map to view the boundaries of the Zone I and Zone II areas.

Currently the water does not receive treatment. For current information on water quality monitoring results, customers of Berkshire Spring should contact the Public Water System contact person listed above in Table 1. However, customers of Berkshire Village Cooperative, which receives its water from Berkshire Spring, should instead contact Mary Jane Dilego at (413) 499-0455 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

## Section 2: Land Uses in the Protection Areas

The land uses for the Zone II for Berkshire Spring are predominantly residential, with some commercial uses, including portions of the Berkshire Mall. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the attached Table of Regulated Facilities.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Photo Processing Lab
3. Automobile Repair and Maintenance Shop
4. Residential Land Uses
5. Protection Planning

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as shown in Table 2.



**1. Non-conforming Zone I** – The Zone I for Spring #1 is square shaped with each side length measuring 800 feet. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction and allows only water supply related or other non-threatening activities in the Zone I. Many public water supplies were developed prior to the Department's regulations and contain non water supply activities. The following non- water supply activities occur within the Zone I:

**Zone I Activities:** The Zone I contains portions of Summer Street and Old State Road, and private residences.

**Zone I Recommendations:**

- ✓ To the extent possible, limit access to the Zone I area.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

**2. Photo Processing Lab** – The photo processor at this location is registered through the Environmental Results Program as a photo processor and additionally as a small quantity generator of hazardous waste. The Environmental Results Program (ERP) streamlines existing pollution control requirements for photo processing facilities by replacing individual water pollution control and hazardous waste recycling permits with a minimum statewide silver discharge limit; monitoring; and simplified operating and maintenance rules. Most automated photo processing equipment produces silver-bearing waste.

**Recommendation:**

- ✓ The photo processor should review its Environmental Results Program (ERP) certification and the *Photo Processor Environmental Certification Workbook* for photo processors that covers DEP's industrial wastewater management, and hazardous waste management requirements for photo processing operations. The workbook explains the standards, and provides tips on how to comply. Some facilities may be subject to additional state, federal or local environmental standards that are not covered by the ERP compliance certification. The photo processor must still comply with these requirements, even though they are not included as part of the ERP certification.

**3. Auto Repair and Maintenance Shop**– An automobile repair/maintenance shop is located within the Zone II. If handled improperly, leaks and spills of automotive fluids and cleaning solvents can potentially contaminate the water supply.

**Recommendations:**

- ✓ Educate the neighboring auto repair shop about the location of the well and Zone II.
- ✓ Encourage the shop to use BMPs for the storage, handling, and disposal of all hazardous chemicals.
- ✓ If the auto body facility has floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and

## Glossary

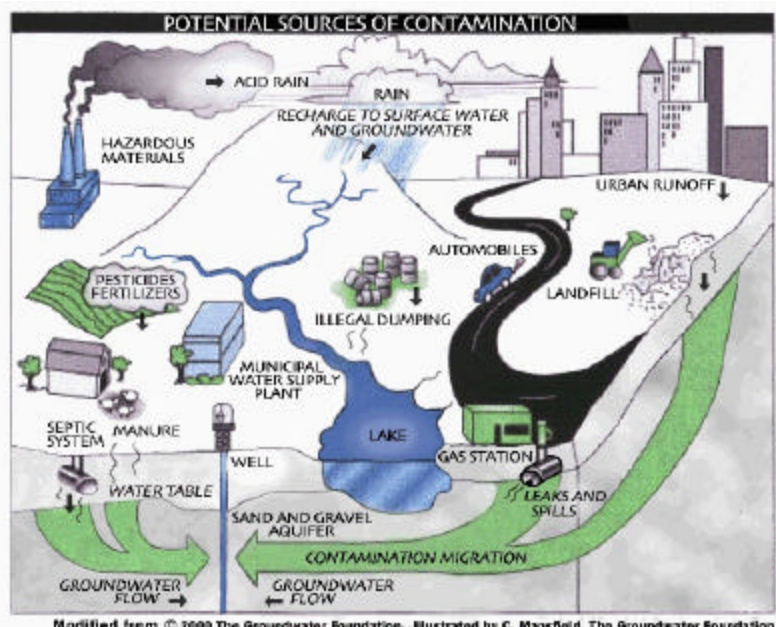
**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.



### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

**4. Residential Land Uses** – None of the residential land uses in the protection areas have public sewers available. Therefore, all discharge wastewater through on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed

improperly, Underground and Aboveground Storage Tanks (UST and AST) and their associated fuel lines, can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

### Source Protection Decreases Risk

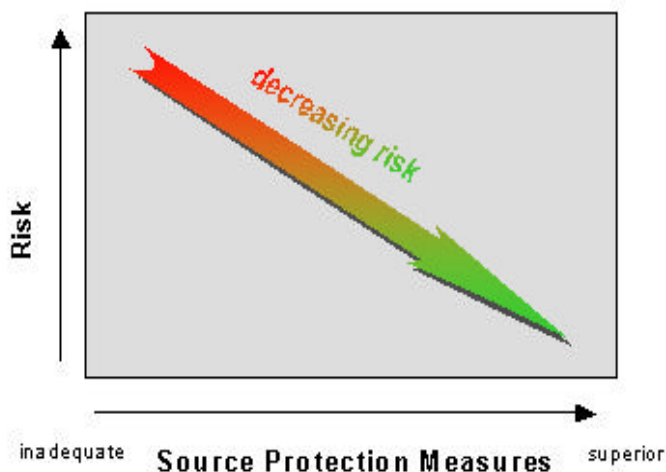


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Commercial</b>			
Photo Processors	1	Moderate	Photographic chemicals: spills, leaks, or improper handling and storage.
Automobile Repair Shops	1	Moderate	Automotive fluids and solvents: spills, leaks, or improper handling and storage.
<b>Residential</b>			
Fuel Oil Storage	Numerous	Moderate	Fuel oil: spills, leaks, or improper handling.
Lawn Care	Numerous	Moderate	Pesticides: over-application or improper storage and disposal.
Septic Systems	Numerous	Moderate	Hazardous chemicals and microbial contaminants: improper disposal.
<b>Miscellaneous</b>			
Stormwater Drains/Retention Basins	Few	Low	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns.
Small Quantity Hazardous Waste Generator	2	Moderate	Hazardous materials and waste oils: spills, leaks, or improper handling or storage.
Utility Substation Transformer	1	Low	Chemicals and other materials including PCBs: spills, leaks, or improper handling.
Wastewater Treatment Plant	1	Moderate	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management.
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

(Continued from page 4)

- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.
- ✓ Supply BMPs to home owners for fuel storage.

**5. Protection Planning** – Currently, the Town does have water supply protection controls, however they do not meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Additionally, the protection area only covers the Zone II for the Lanesborough Fire District wells. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Recommendations:**

- ✓ Request that the town include the protection areas in the Town Water Supply Protection District.

In addition to the land uses discussed above there are also Small Quantity and Very Small Quantity Generators of Hazardous Waste and/or Waste Oil, a utility substation transformer, a wastewater treatment plant, and stormwater drains located within the Zone II. Most of these activities are associated with the Berkshire Mall that is located in the extreme upstream edge of the Zone II. Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Berkshire Spring should review and adopt the key recommendations above and the following:

- ✓ Educate residents within the Zone II on ways they can help you to protect the drinking water source, including regular inspection and maintenance of their septic systems.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Contact the electric utility to determine if PCBs have been replaced in any transformers that are identified within the Zone II. If PCBs are present, urge their immediate replacement. Keep the area near any transformer free of tree limbs that could endanger the transformer in a storm.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>. Berkshire Spring should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Table of Regulated Facilities
- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

#### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - Increased groundwater monitoring and treatment
  - Water supply clean up and remediation
  - Replacing a water supply
  - Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.





# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
HIDDEN VALLEY CAMPGROUND



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Hidden Valley Campground
<b>PWS Address</b>	15 Scott Rd.
<b>City/Town</b>	Lanesborough, Massachusetts
<b>PWS ID Number</b>	1148016

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1148016-01G	226	554	High	Moderate
Well #2	1148016-02G	167	462	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

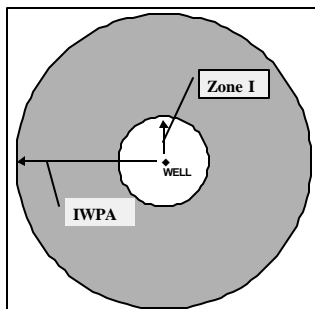
Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1148016-01G)**

Zone I = 226 ft.  
IWPA = 554 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic leach fields within the IWPA of Well #2 and system components in the Zone Is of both wells. The **moderate** susceptibility to potential non-microbial threats for Well #1 is based on the vehicle parking within the Zone I and the IWPA, and for Well #2 is based on the parking and local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, Sanitary Survey, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- 3 inspect the Zone I and IWPA regularly;
- 3 work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- 3 restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- 3 make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- 3 remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- 3 do not use pesticides, fertilizers or road salt within the Zone I;
- 3 address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- 3 water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/den/hrn/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Lee Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Lee Water Department
<i>PWS Address</i>	32 Main Street
<i>City/Town</i>	Lee
<i>PWS ID Number</i>	1150000
<i>Local Contact</i>	Mr. Kenneth LaBier
<i>Phone Number</i>	413-243-5526

### Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

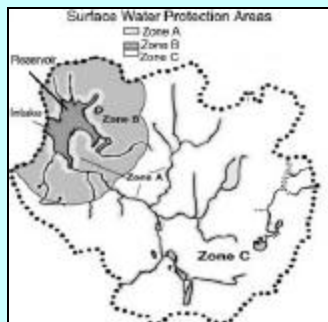
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

### System Susceptibility:

*Moderate*

### Source Name

### Source ID

### Susceptibility

Leahey Reservoir	1150000-01S	Moderate
Vanetti Reservoir	1150000-02S	Moderate
Schoolhouse Reservoir	1150000-03S	Moderate

Lee is a small, rural industrial and residential community located in the Housatonic River valley in southwestern Massachusetts. Lee was incorporated in the late 1700s starting as an agricultural community. Industrial development commenced with the textile industry and expanded to include marble quarrying and the mainstay industry of paper manufacturing. The developed portions of town are along the Housatonic River valley with the valley bounded on the west by the Taconic Range and on the east by the Berkshire Massif. The reservoirs are located in East Lee and the town of Washington.

Lee Water Department maintains three water supply reservoirs: Leahey Reservoir (01G), Vanetti Reservoir (02G) and Schoolhouse Reservoir (03G). Schoolhouse Reservoir was developed to supplement the Lee and Lenox water supplies with Lee having rights to 51% of the available yield. The Water Department also maintains the Vanetti Reservoir (02G) as an inactive source and has rights to water from October Mountain Lake (04G) as an emergency source of water. The DEP has previously incorrectly referred to 04G as Washington Mountain Lake but has corrected all of its records. The emergency source of water will not be assessed in this report.

The Leahey and Vanetti Reservoirs are located in East Lee; the watersheds extend into Washington. The Schoolhouse Reservoir and its watershed are located on October Mountain in the town of Washington. The topography of the watersheds is steep sloped valleys. The overburden material within the watersheds is predominantly a thin cover of glacial till, often referred to as hard pan, with significant areas of exposed bedrock; the brook valleys have limited deposits of recent alluvium and swamp deposits. The bedrock in the watershed is mapped as several formations consisting of metamorphic rocks and intrusive rocks of the Berkshire Massif (paragneiss, metavolcanics and orthogneiss). The structural geology of the region is highly complex with several stages of folding, faulting and significant structural movement. The watershed is located within an area of highly folded and faulted rocks. In fact, the major faults in the immediate area are identified as the Upper Reservoir and October Mountain faults.

One hundred percent (100%) of the Leahey and Schoolhouse Reservoirs' watersheds are protected from development through ownership by the water supplier or as state owned park land. Seventy-six percent (76%) of the Vanetti Reservoir watershed is owned by the Lee Water Department with the remainder of the watershed privately held forest. According to the Water Department, the landowner is proposing to conduct forest cutting at some time in the future. Nearly 100% of all of the watersheds are forest, water or wetlands. The land use map identifies an industrial land use within the Vanetti Reservoir watershed. The

facility identified is the Lee Water Department Water Treatment Plant. The water treatment plant is connected to the sewer and is located partially within and partially outside of the inactive Vanetti Reservoir watershed. Please refer to the attached map to view the boundaries of the protective areas.

Water from all of the reservoirs is treated through a Krofta filtration system, a dissolved air flotation filtration system, then chlorinated for disinfection and pH adjusted with soda ash for corrosion control. For current information on water quality monitoring results and treatment processes, please refer questions for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies the sources are considered highly vulnerable to potential contamination threats. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Transportation/recreation corridors
3. Water Treatment Facility
4. Forestry and protection planning

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at a least one moderate threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone A** - The Zone A for a reservoir includes all areas within 400 feet of the reservoir shoreline and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Zone A is the area closest to the reservoir and its tributaries. Therefore, land uses within the Zone A are of particular concern. Activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc. It is reported that beavers periodically populate the watersheds.

There are numerous unpaved ways as well as legal (authorized) and illegal (unauthorized) trails throughout the watersheds. Most of these roads and trails are not maintained at all or are minimally maintained. The most active area is within October Mountain State Forest

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

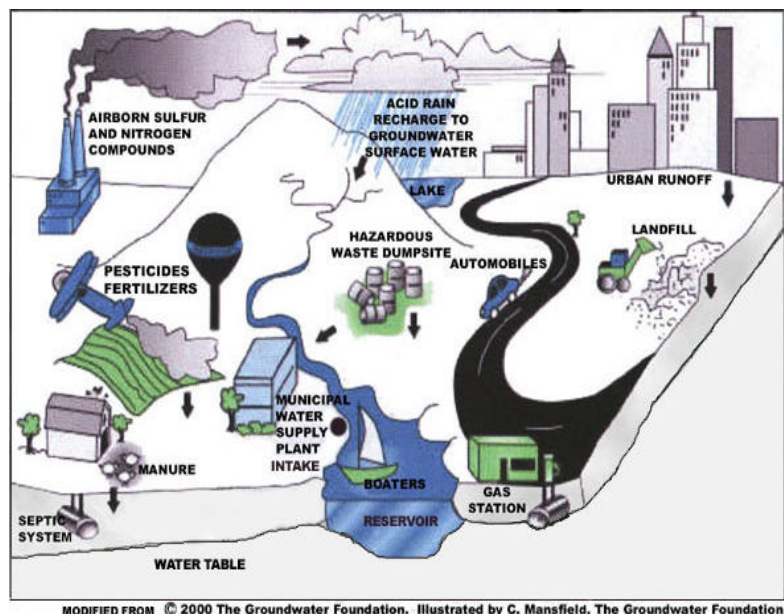
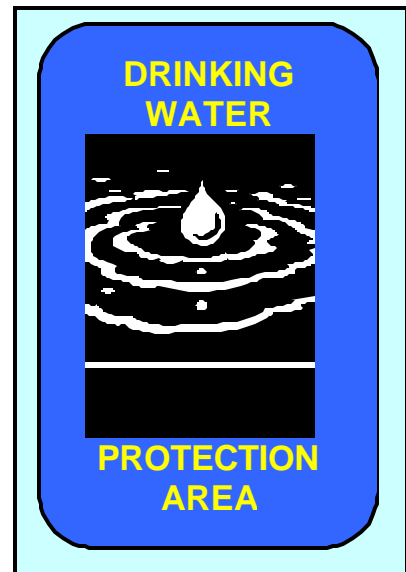


Figure 1: Sample watershed with examples of potential sources of contamination

along Lenox Whitney Place Road, County Road, Schoolhouse Road extension and Schoolhouse Trail. Some of these areas are remote from the reservoirs while others are immediately adjacent to the Schoolhouse Reservoir and/or cross feeder brooks. The Schoolhouse Trail and County Road converge near Schoolhouse Reservoir where there is an open area actively utilized by all terrain vehicles (ATVs). Reportedly there is no activity on the face of the dam. Uncontrolled access may result in erosion that poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, potentially resulting in additional water treatment costs if they continue unchecked. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Access to the reservoirs was observed and anecdotal information indicates evidence of camping near the reservoirs and throughout the watersheds. Unmanaged access may result in vandalism, illegal dumping and access to the reservoir resulting in water quality impairment.

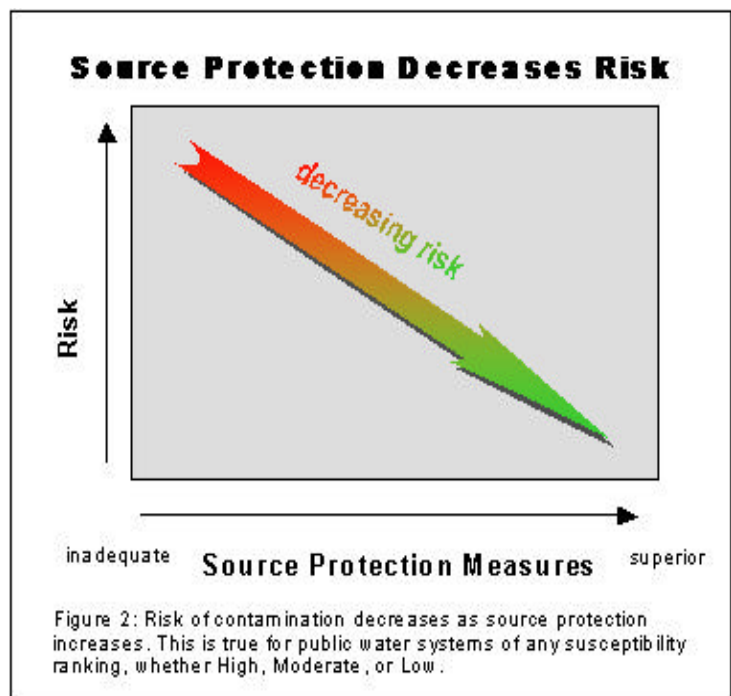
#### **Transportation/recreation Corridor Recommendations:**

- ✓ Consider preparing a watershed management plan to address stormwater management and erosion control on town-owned property and throughout the watershed. Include an inventory of the existing conditions within the watershed and determined numerous areas of uncontrolled access and erosion problems. Specifically, review all activities adjacent to the Schoolhouse Reservoir. Address public access and ATV use at the reservoir with respect to access to Zone A, protection of the infrastructure and erosion into the reservoir from activities near the reservoir.
- ✓ Investigate disposition of all roads, ways and "trails".
- ✓ Increase patrols of watershed land and enforce no trespassing.
- ✓ Evaluate all options for management of access to ways. Include evaluation of continuing current practice of full access, closing roads to all traffic, closing road to all commercial traffic and limiting access only to residents with a locked gate and key for residents only. Communicate with Selectmen or the State (for old county roads) regarding abandonment, control and other access issues for town roads.
- ✓ Evaluate stormwater drainage along the few local roads in the watershed. Consider various strategies to detain/slow the flow, redirect runoff out of the watershed or retain/detain sediments from roads within the watershed. Since these roads are in neighboring communities, the Water Department should foster a relationship with the communities to evaluate and mediate stormwater threats identified within the watershed. Coordinate efforts for work and cost sharing with the Town of Washington as appropriate.
- ✓ Evaluate existing conditions throughout the watershed with respect to current illegal use of watershed land. Determine where illegal access is being gained and what are the destination points. Develop a strategy and management plan to eliminate or control access. Coordinate with the communities for management strategies.
- ✓ Coordinate with local emergency response teams to ensure effective management of



#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watersheds**

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
<b>Agricultural</b>				
Forestry Operations	Few	M	01S	Leaks and spills, improper handling of petroleum products in equipment. Erosion.
Water Treatment Plant	1	M	02S	Fuel oil household hazardous materials: spills, leaks, or improper handling.
Transportation/ recreation corridor (legal/illegal)	Few	M	01S	Petroleum products accidental leaks or spills; illegal access to the reservoir. Potential for erosion and access to Zone A.
Underground Storage tank (fuel oil)	1	M	02S	The tank is double lined with an alarm system. Leaks and spills from breaks and/or overfills are the potential threat.

#### Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- potential spills.
- ✓ Contact MA DCR regarding uncontrolled and advertised access to abutting DCR land to develop an effective strategy to eliminate, control and/or manage access as appropriate through the watershed, especially in areas proximal to the Zone A. Request an access and management plan for all lands within the Schoolhouse Reservoir watershed including BMPs as appropriate.
- ✓ The Department has a policy for responding to beavers that may threaten water quality in a watershed. Please refer to the website for guidance at <http://www.state.ma.us/dep/brp/dws/protect.htm>.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Inspect roadways to determine if improvements to the road are required to prevent stormwater runoff and erosion to the reservoir. If it is determined that road improvements are necessary, develop a plan and implement improvements. USDA funding may be available for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural



Development Manager at the local office in Hadley at 413-585-1000. Alternatively, review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> or call the NRCS office in Pittsfield 413-443-6867 ext. 3 for assistance.

- ✓ Visit the DEP Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm> for more information on other grants and loans.

**3. Water Treatment Facility** - The Lee Water Treatment Facility is located within the Zone A of the upper reservoir. The facility is served by municipal sewer and drainage from the facility is reportedly directed outside of the watershed. Activities associated with water treatment involve storage and use of hazardous materials such as chlorine, sodium hydroxide and fuel oil for the generator. In fact there is a 4,000 gallon underground storage tank for fuel oil at the facility. The tank is double lined with an alarmed leak detection system. All water treatment chemicals are stored above ground in secondary containment. Stormwater from the facility reportedly discharges outside of the watershed. Spills or leaks of hazardous materials during handling and delivery and stormwater are a potential source of contamination.

**Water Treatment Facility Recommendations:**

- ✓ Ensure that the water treatment facility is operated and maintained according to DEP requirements.
- ✓ Ensure that stormwater drains and the drainage system around the treatment plant do drain outside of the watershed. Maintain stormwater system and catchbasins as necessary.
- ✓ Continue current use of best management practices for proper handling of materials and in containing spills and leaks.
- ✓ Update emergency plans as necessary.

**4. Forestry and Protection Planning** – The Water Department does not have an approved Water Supply Protection Plan (WSPP). The watersheds are primarily woodland and the Water Department owns nearly 100% of the Leahey watershed with the state and private land owners owning the rest of the forest land. Good forest management of watershed land can beneficially impact water quality and health of the watershed forests. Forest management includes recreational activities as well as forest cutting.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Forestry Protection Planning Recommendations:**

- ✓ Establish active watershed protection planning and forest management for water supply protection in a comprehensive watershed plan. Prepare a comprehensive watershed and forest management plan specifically designed for a water supply watershed. Contact DCR to discuss a comprehensive plan that will incorporate active management of recreational activities in the immediate vicinity of the reservoirs and Zone A. Implement the plan and include BMPs for wetlands and stream crossings and in compliance with forestry regulations as appropriate.
- ✓ Encourage and support efforts by private land owners to actively manage forests for water supply protection, as appropriate.
- ✓ Continue to monitor all activities on Town, state and privately held land within the watershed.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step toward protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water



supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Detailed knowledge of the watershed and active involvement in inspecting and inventorying land uses in the watershed.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue inspection of the Zone A protection areas and watershed regularly, and when feasible, remove or manage any non-water supply activities.
- ✓ Continue cooperation and communication with emergency response teams to ensure that they are aware of the boundaries of the watershed for notification of spills or accidents.
- ✓ Through the implementation of the WSPP, provide information to private landowners in your protection areas to make them aware of your water supply and to encourage the use of best management practices for forest management to protect drinking water sources.
- ✓ As part of the stormwater evaluation and mitigation plans, identify problem area specifically in the Zone A along roads/trails throughout the watershed. Make every effort to ensure stormwater discharge and runoff is detained prior to release to protection areas. Consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of the reservoirs. Direct runoff out of the watershed if feasible. Work with the DCR to review their trails, access policies and management of activities that have the potential to impact the reservoirs.
- ✓ Once the forest management plan has been approved, implement the plan to establish/maintain a healthy and ideal watershed forest, which will buffer anthropomorphic and natural environmental impacts on water quality and quantity.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues, above and in Appendix A.

#### **➤ Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the source protection areas are located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

#### **➤ Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for

### **Top 5 Reasons to Develop a Local Surface Water Protection Plan**

#### **❶ Reduces Risk to Human Health**

#### **❷ Cost Effective! Reduces or Eliminates Costs Associated With:**

- ♦ Increased monitoring and treatment
- ♦ Water supply clean up and remediation
- ♦ Replacing a water supply
- ♦ Purchasing water

#### **❸ Supports municipal bylaws, making them less likely to be challenged**

#### **❹ Ensures clean drinking water supplies for future generations**

#### **❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.**

### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

assistance.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help establish local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to establish priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

### **A. General Protection Recommendations**

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Monitor activities in Zone A.
Is the Zone A posted with "Public Drinking Water Supply" or "No Trespassing" signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue regular inspections of drinking water protection areas. Increase patrols as appropriate and develop a plan to control access in critical areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, Ordinances and General Bylaws)		
Do the watershed municipalities have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>NO</b>	The Water Department or state owns nearly the entire watershed. The small portions of the watershed that are privately held are at this time fully developed.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>NO</b>	Prepare a plan to inventory activities and issues related to stormwater management erosion control, access management and forest management.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Update the plan as appropriate by developing a joint emergency response plan with the Fire Department, DCR and local and state emergency officials.
Does the municipality have a watershed protection committee?	<b>NO</b>	Consider establishing a committee that includes representatives from municipal and citizens' groups.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide watershed protection education?	<b>NO</b>	Consider working with DCR to control access to Zone A and areas that have the to potential to impact the reservoir.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
COLD SPRING



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 25, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Cold Spring
<i>PWS Address</i>	Tyringham Rd
<i>City/Town</i>	Lee, Massachusetts
<i>PWS ID Number</i>	1150002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I (feet)</i>	<i>Zone II</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 Spring	1150002-01G	682	Refer to the map	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and a Contribution Area or Zone II. The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The Contribution Area is the larger area that is likely to contribute water to the spring. Refer to **Figure 1** on page 2 for an example of a Zone I and Contribution Area.

The Contribution Area of Zone II is the primary recharge area for the aquifer and the spring source. This area was defined by a hydrogeologic study conducted for the MA DEP SWAP program by the USGS. The Zone II was approved by DEP. Refer to the attached map to determine the land within your Zone II.

### What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Contribution Area (Zone II). Please see the enclosed map for your well's Zone I and Zone II areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

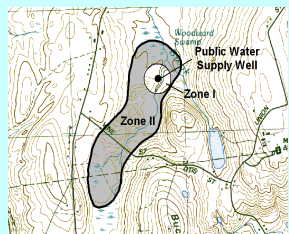
Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I IWPA  
EXAMPLE Source Protection  
Area for WELL #1 SPRING  
(1150002-01G)**

Zone I = 681 ft.  
Refer to map for the  
Contribution Area

### What is a Protection Area?

A spring's water supply protection area is the land around the spring where protection activities should be focused. Each spring has a Zone I protective area and a contribution area (Zone II).



### How Was My Well's Susceptibility Determined?

Your spring's **high** susceptibility to potential microbial threats is based on the construction of the source. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Lenox DPW Water Division**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Lenox DPW Water Division
<i><b>PWS Address</b></i>	275 Main Street
<i><b>City/Town</b></i>	Lenox
<i><b>PWS ID Number</b></i>	1152000
<i><b>Local Contact</b></i>	Richard Fuore
<i><b>Phone Number</b></i>	413-637-5525

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices



## Section 1: Description of the Water System

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.

#### Source Name

#### Source ID

#### Susceptibility

Upper Root	1152000-04S	Moderate
Lower Root	1152000-01S	Moderate

Lenox DPW Water Division utilizes two reservoirs for their drinking water sources, and has the capability to purchase water from Pittsfield and Lee. The Root Reservoirs are in the highlands of western Lenox, north of Baldhead peak and hold a combined storage volume of 169 million gallons. The upper reservoir has two perennial feeder brook and one ephemeral brook. The regional geology of the reservoir site is mapped as biotite-rich quartzose schist, locally rich in pyrite; the remainder of the watershed area includes

areas of quartzose schist, rich in chlorite, garnet and interbedded metaquartzite. The overburden is comprised of glacial till. Reservoir Road runs between the two reservoirs: the Upper (1152000-04S) and Lower (1152000-01S) Root Reservoirs. The watershed for Lenox's reservoirs is primarily forested upland (95%) with the remaining 5% of the watershed consisting of transportation corridors, residential and non-commercial agricultural activities such as pasture land. The Water Department owns approximately 90% of the watershed with other conservation agencies such as Audubon owning a few percent of the remaining watershed. Please refer to the attached map to view the boundaries of the protective zones.

Water from the reservoirs flows to a treatment plant where the processes consist of chemical addition, flocculation, dissolved air flotation, and filtration. The water is chlorinated for disinfection prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the relatively small size of the reservoir and the nature of surface water supplies, the sources are considered highly vulnerable to potential contamination. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Residential land use in Zone A/C
2. Forest/Watershed management
3. Transportation corridors
4. Public Access

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 0.6 acres of the Zone A and C consists of residential areas. None of the areas have public sewers, therefore on-site septic systems are used. However, it appears that the septic systems may be outside of the watershed or remote from the reservoir. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to

### Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Consider negotiating a Right of First refusal agreement or conservation restrictions for land not currently owned by the Town.

**2. Transportation Corridors** - Reservoir Road, a steep and narrow road is located along the base of the upper reservoir and immediately adjacent to the lower reservoir. Though this is a low-use roadway, the close proximity of the Reservoir Road to the reservoirs, typical roadway maintenance and use can pose a potentially significant source of contamination from accidents and washouts along the dirt road. De-icing materials, automotive chemicals

and other debris on roads are picked up by stormwater washed into catch basins and discharge into the reservoirs. The access road to the filtration plant has a drainage system that directs runoff through a swale and outside of the watershed.

#### Transportation Corridor Recommendations:

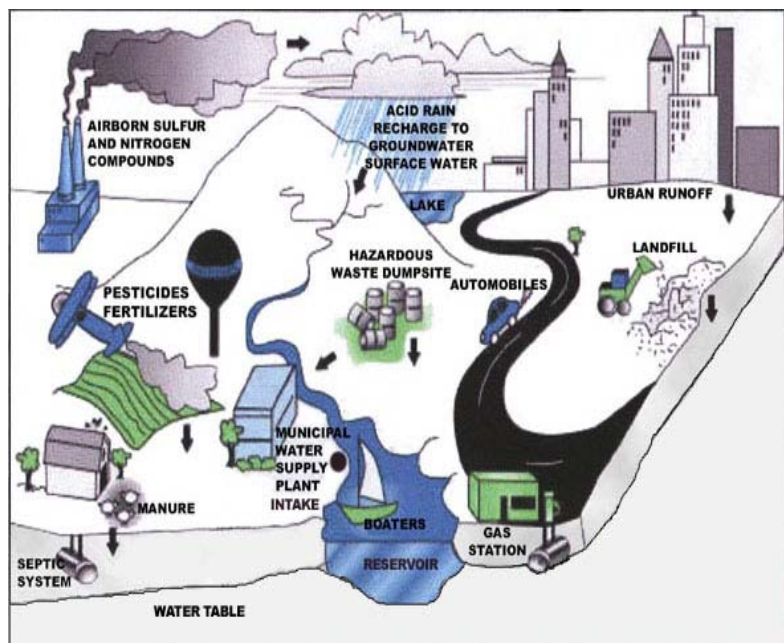
- ✓ Evaluate all options for management of access to Reservoir Road. Include evaluation of continuing current practice of full access, closing road to all traffic (abandonment of road), closing road to all commercial traffic and limiting access to residents with a locked gate and key for residents only. Richmond must be involved in discussions regarding access control on reservoir Road.
- ✓ Identify stormwater drains and the drainage system along reservoir road and the filtration plant access road. Evaluate tying the drainage system along

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



MODIFIED FROM © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

Figure 1: Sample watershed with examples of potential sources of contamination

Reservoir Road into the system along the access road to ensure stormwater discharges outside of the protection areas. Alternatively consider various strategies to detain/slow the flow and retain sediments for both the east and west side of Reservoir Road.

- ✓ Inspect, maintain, and clean catch basins on a regular schedule.
- ✓ Work with local emergency response teams to ensure effective management of potential spills. Include Richmond official in discussions regarding access to Reservoir Road.

**3. Forestry/Watershed management** – The majority of the watershed is logged periodically as recommended by the Town's contract forester; all activities are monitored and managed by the forester. However, there is no watershed/forest management plan at this time. There is no evidence of significant aquatic wildlife such as beavers or muskrats in the watershed at this time. The Northeast Rural Water Association (NeRWA) is commencing the preparation of a Watershed Protection Plan for the Lenox DPW Water Division.

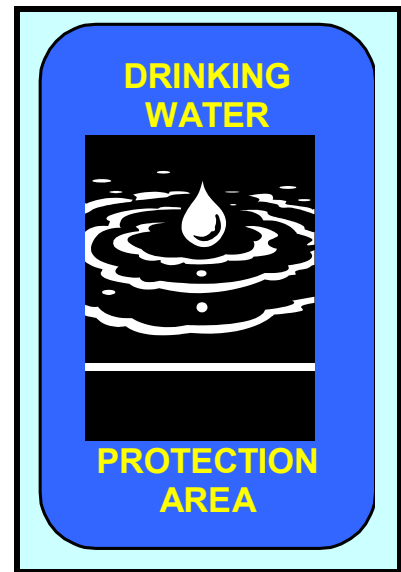
- ✓ Include in the watershed protection plan, an evaluation for the need forest inventory and forest management plan specifically designed for watershed management.
- ✓ Evaluate whether there are impacts associated with access and determine what if any, management strategies required for public access to the watershed.
- ✓ Continue to inspect the watershed regularly.
- ✓ Right of way maintenance should be conducted by mechanical means. Supply all utilities and road maintenance crews with detailed maps of the watershed area where they may be conducting maintenance. Meet with the staff in charge of conducting the maintenance and confirm all stream crossings and Zone A areas are accurately mapped.

**4. Public Access** - Although the Water Department does not allow public access to the watershed, there is significant use of the old roads and trails throughout the watershed by hikers, ATV users and mountain bikers. Uncontrolled use can result in erosion, vandalism and refuse problems in the

watershed. One of the main trails is gated to prevent access by 4WD street vehicles.

- ✓ Evaluate the current extent of public access and include measurable negative or positive impacts.
- ✓ Prepare a plan to control those activities that pose a negative impact e.g. erosion, refuse disposal, threat to infrastructure. The recommendations could include increased patrols, physical barriers, public education or enforcement.

Land uses and activities within the Zone C that are potential sources of contamination are included in Table 2. One additional activity that was identified during the assessment was the potential for private airplanes flying over the reservoir. The Pittsfield Airport, located four miles north of the reservoirs results in frequent flyover of the reservoir. Although the airport is not within the watershed, the reservoir is on the takeoff and approach of the airport and experiences private planes flying over the



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

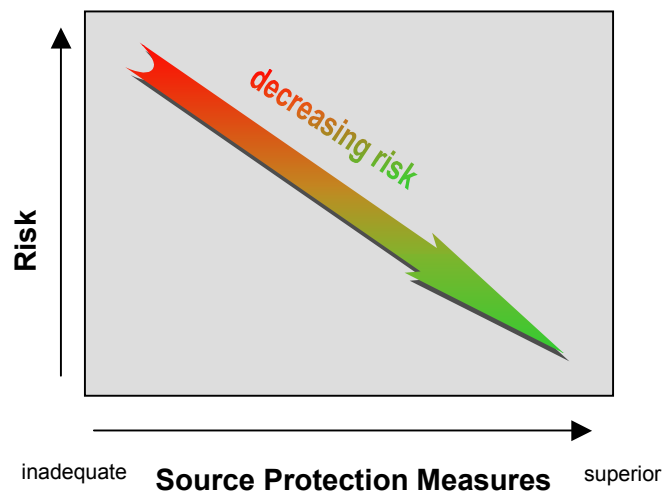


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

## Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Sources of Contamination*
<b>Residential</b>			
Fuel Oil Storage (at residences)	1	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	1	M	Pesticides: over-application or improper storage and disposal
Septic Systems	1	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Forestry	Throughout	M	Runoff; mismanaged petroleum products; accidental spills, leaks
Aquatic Wildlife	Throughout	L	Microbial contaminants
Transmission Line Rights-of-Way -Type: Telephone	1	L	Corridor maintenance pesticides: over-application or improper handling
Transportation Corridors	1	M	Fuels and other hazardous materials: accidental leaks or spills; uncontrolled access to the reservoir

### Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



reservoir. It is recommended that the emergency response teams coordinate with the airport to establish a clear contact and communication in the event of an accident that may occur within the watershed. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

Lenox's water supply is fairly well protected by the remoteness of the source and the percentage of land owned by the Town (90%). Additionally, a conservation group owns a significant portion of the remaining land. Although the system's protection areas contain few potential sources of contamination, the proximity of the activity to the water source increases the risk to the water supply. Implementing source protection measures reduces the risk of actual contamination. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership of over 90% of the watershed,
- Actively pursuing funds to prepare a watershed protection plan.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone C and to cooperate on responding to spills

#### Additional Information

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

or accidents.

- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a best management practices for residential and recreational uses.
- ✓ Develop and implement Forest Management Plan for water supply protection.
- ✓ At a minimum, restrict road access to non-commercial vehicles only to minimize risk of hazardous contaminants.
- ✓ Request that the utility supply you directly with their maintenance plan. Provide AT&T an accurate map of the watershed and meet with their representative to ensure they are working with an accurate map.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to

#### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water is a place people want to live and businesses want to locate.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>YES</b>	The Town owns 90% of the watershed. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations adopt further protection.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include the watershed in their protection controls.
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>NO</b>	Develop a surface water supply protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>NO</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide watershed protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the watershed.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For LEVERETT VILLAGE CO OP



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Leverett Village Co Op
<i>PWS Address</i>	180 Rattlesnake Gutter Rd
<i>City/Town</i>	Leverett, Massachusetts
<i>PWS ID Number</i>	1154000

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1154000-01G	100	417	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

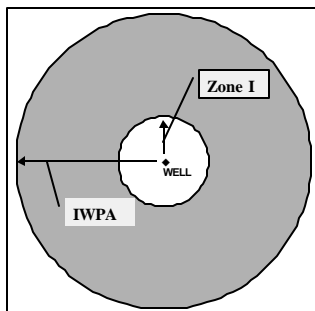
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1154000-01G)**

Zone I = 100 ft.  
IWPA = 417 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on septic system components from several systems located within the Zone I IWPA of the well and the adjacent pasture. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas located within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data, a Sanitary Survey conducted at your facility, as well as from other sources of information.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Leverett Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 16, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Leverett Elementary School
<i>PWS Address</i>	Montague Road
<i>City/Town</i>	Leverett, Massachusetts
<i>PWS ID Number</i>	1154001
<i>Local Contact</i>	Mr. John Kuczek
<i>Phone Number</i>	413-548-9144

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1154001-01G	128	434	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Leverett Elementary School is a rural, elementary school located on the east side of Montague Road in Leverett. The school student and staff population is approximately 230 people per day and is served by a single potable supply well (Well #1) located west of the school. The school well also supplies potable water for the adjacent Town facilities (Highway and Fire Department Buildings) and is intended to supply the proposed library facility. The school and municipal facilities are undergoing renovation and/or new construction. The school attempted to replace the existing well with a new source located in a more remote location. However, the water from the new well is turbid and has high concentrations of dissolved solids. The estimated cost of treatment may be cost prohibitive and the community is working with the DEP to consider various options for a new supply.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The current well has a Zone I protective radius of 128 feet and an Interim Wellhead Protection Area (IWPA) radius of 434 feet based on an average, maximum daily withdrawal rate from metered usage data. The protective radii were based on the average daily-metered water use for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller.

The 6-inch diameter well is, estimated to be drilled to a depth of approximately 200 feet below ground and utilizes the bedrock aquifer. There is no record of the well construction or the materials encountered during drilling of the well. The geologic mapping of the area indicates stratified drift, sand and gravel deposits in the vicinity of the school although there is no description of the depth of the deposits. The area is located within the Town of Leverett's Aquifer Protection District. The bedrock geological map shows complex bedrock structure in the vicinity of the school and describes various bedrock formations of sulfidic schist, amphibolite and gneiss. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water from the school's current well does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. Structures in the Zone I
2. Septic System
3. Floor drain in boiler room
4. Parking and roadway

There are activities within Zone I that are not related to water supply and the well is

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System components	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Floor Drain in the boiler room to septic system	Yes	Yes	Moderate	Floor drain must be protected from accidental spills or connected to tight tank.
Parking area and roadway	Yes	Yes	Moderate	Storm water drains away from the wellhead
Aboveground oil tank	No	Yes	Moderate	Covered and in containment
School structure and Fire Station	Yes	Yes	-	Non-conformance with Zone I requirements

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration from the surface. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming activities in Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The facility's Zone I contains school buildings, roads and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Maintain contact with the DEP regarding alternatives to the existing source.
- ✓ Monitor activities within the Zone I and minimize as much as is feasible, activities in Zone I.

**2. Septic system components in the IWPA** - The septic tank, grease trap, pipeline, distribution box and leachfield are all within the IWPA of the well. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals or petroleum products to septic systems or discharge from the boiler room are also potential sources of contamination to the leachfield. The Highway Department is scheduled to have a tight tank installed for the garage.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, certified operator, Town Highway and Fire Department personnel. The Town Highway Department is registered as a generator of hazardous waste or waste oil. Continue to diligently monitor use, storage and disposal of hazardous materials.
- ✓ Septic system components should be inspected and maintained on a regular basis.

**3. Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for oil or hazardous materials to flow accidentally into the floor drain, however, the floor drain

must be sealed or connected to a tight tank if no sewer is available. The boiler room at the Leverett Elementary School has a floor drain that discharges to the septic system. The boiler is set within a recessed containment structure. At the time of the site visit, there were cracks and holes in the floor of the containment area that could act as conduits to the ground in the event of a release of oil and the old oil lines from the abandoned tank were not drained or capped. Immediately following the visit, the abandoned oil lines were drained and filled. The oil line was bermed so that it would drain to the recessed, cemented containment area that holds the boiler in the event of a line break. All breaks in the floor were cemented and sealed to contain any potential spills.

### Recommendations:

- ✓ Continue current investigation regarding the feasibility of sleeving the oil line from the tank to the boiler.
- ✓ Prepare a written policy and plan for maintenance operations, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while

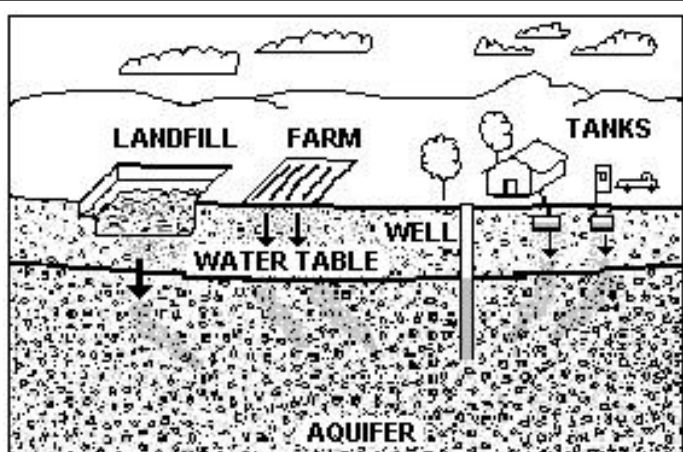


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.

- ✓ If protection of the floor drain cannot be assured, seal the floor drain or a tight tank must be installed for the floor drain.

**4. Parking and roadway** - The bus drop-off area, Montague Road and parking areas are within the Zone I and IWPA of the well. Drainage from the school is discharged to an area that topographically drains away from the wellhead.

#### Recommendations:

- ✓ Use minimal road salt and deicers.
- ✓ Monitor the parking lot for spills and leaks.
- ✓ Maintain a buffer from parking near the well.

Other land uses observed were portions of the Town complex (Fire Station and Highway Department Garage), pad mounted electrical transformers, residential homes and septic systems all located within or just outside of the IWPA of the well. Store all petroleum products in secondary containment and contact the power utility to ensure that the oil in the transformer does not contain PCBs. Inform residential neighbors of BMPs for septic system management, lawn care and management of household hazardous materials.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Leverett Elementary School is commended for recent actions and current protection measures.

Please review and adopt the key recommendations listed above and as follows:

#### Zone I and IWPA:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I and monitor the area for spills and leaks.
- ✓ Monitor oil delivery and storage.
- ✓ Continue working with DEP to regarding the potential for replacement of the well.
- ✓ Post drinking water supply signs key location such along the access road and in the parking area.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Do not use fertilizer or pesticides.
- ✓ Use Best Management Practices (BMPs) for hazardous products.

#### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

#### Facilities Management:

- ✓ Septic system components should be maintained on a regular basis. Refer to the

appendices for more information regarding septic systems.

- ✓ Continue staff training in the handling of hazardous materials.

#### Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.



- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet
- UIC Closure documents
- Your Septic System Brochure
- Grant Program Fact Sheet



# Source Water Assessment Program (SWAP) Report for Hampshire-Franklin Children's Day Care

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Hampshire-Franklin Children's Day Care</b>
<i>PWS Address</i>	<b>59 Long Plain Road, State Route 63</b>
<i>City/Town</i>	<b>Leverett, Massachusetts</b>
<i>PWS ID Number</i>	<b>1154004</b>
<i>Local Contact</i>	<b>Mr. Thomas Wildman-Hanlon</b>
<i>Phone Number</i>	<b>413-548-9674</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1154004-01G	100	416	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Hampshire-Franklin Children's Day Care is a rural, childcare facility located on the east side of Long Plain Road, State Route 63 in Leverett. The population of children and staff is approximately 35 people per day and is served by a single potable supply well (Well #1) located west of the building. The facility's heat and hot water are both electric.

The well has a Zone I protective radius of 100 feet and an Interim Wellhead Protection Area (IWPA) radius of 416 feet. The protective radii were based on the average daily-metered water use for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead where no activity, other than that related to the water supply, is allowed to take place. The IWPA is a larger area that likely contributes water to the wellhead. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller. The Hampshire-Franklin Day Care facility does have activities within the Zone I that are not related to the water supply and is therefore non-conforming to the Zone I restrictions.

The 6-inch diameter well is reportedly installed in 1987 and drilled to a depth of 520 feet below ground with 20 feet of casing grouted into place. The bedrock geological map shows complex structure in the vicinity of the school and describes various bedrock formations of sulfidic schist, amphibolite and gneiss. The drilling record of the well indicates very shallow depth to bedrock. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water from the well does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Nonconforming activities in Zone I**
2. **Household hazardous materials storage**
3. **Septic systems**
4. **Parking and roadway**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

1. **Nonconforming activities in Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The facility's Zone I contains buildings and parking areas. The storage sheds in front and behind the

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System components	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Household hazardous materials storage	Yes	Yes	Moderate	Dispose of unused materials, use containment
Parking area and roadway	Yes	Yes	Moderate	Storm water drains away from the wellhead
Low density residential	Yes	Yes	Moderate	School facility and residential yards

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

facility contains household hazardous materials. Also note that the well cap was not secure at the time of the site visit. The public water supplier does not own and/or control all land encompassed by the Zone I. Please be aware that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Replace the cap with a secure, watertight cap and grade the area around the wellhead so that water does not flow to or pool around the wellhead.
- ✓ Remove all household hazardous materials from the Zone I. At a minimum, supply secondary containment for all hazardous materials such as gasoline (for the lawn mower) and paint or stain.
- ✓ Monitor activities within the Zone I and minimize activities, as is reasonable.
- ✓ Contact neighbors to be sure they are aware they are within the Zone I of the facility's well and provide information on household BMPs for household hazardous waste, septic system management and lawn care.

**2. Septic system components in the IWPA** - The septic systems for the facility and several neighboring residential homes are within the IWPA. If a septic system fails or is not properly maintained it is a potential source of microbial contamination. Improper disposal of household hazardous chemicals or petroleum products to septic systems are also potential sources of contamination to the groundwater.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals.
- ✓ Septic system components should be inspected and maintained on a regular basis.

**3. Improper storage of hazardous household materials** – Paint, wood stains and varnishes were found stored on open shelves in a shed behind the facility.

### Recommendations:

- ✓ Store in area with a sealed floor and within stable, enclosed cabinets.
- ✓ Provide secondary containment for storage of potentially hazardous items.

**4. Parking and roadway** - The parking area is within the Zone I and the road is within the IWPA of the well. The road is topographically downgradient from the wellhead and the drainage on the road is controlled through a stormwater collecting system. Grading around the wellhead should direct flow away from the well.

### Recommendations:

- ✓ Use minimal road salt and deicers.
- ✓ Monitor the parking lot for spills and leaks.
- ✓ Establish a buffer area prohibiting parking immediately adjacent to the well.
- ✓ Be sure that snow is not plowed on top of the wellhead.

Other activities noted during the site visit were residential buildings. Generally a daycare facility and residential uses pose minimal threat to a water supply provide that best management practices are used with respect to management of household hazardous materials, lawn care chemicals and septic disposal.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Hampshire-Franklin Day Care is commended for current protection efforts (such as the signs on

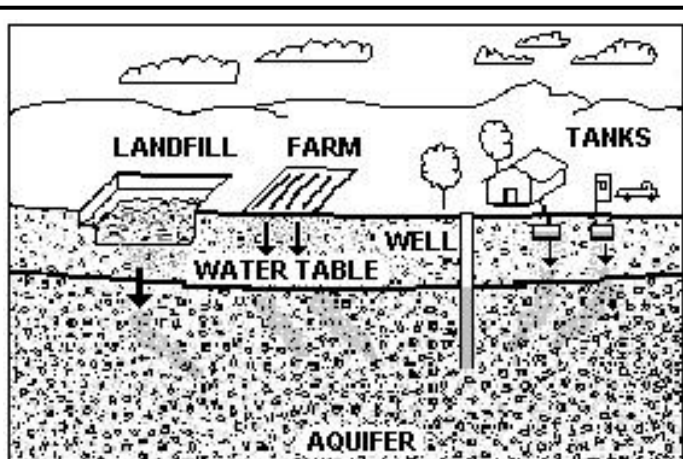


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

the sinks) and encouraged to review and adopt the key recommendations listed above and the following additional measures.

### Priority Issues:

- ✓ Replace the well cap with a watertight, sealed cap.

### Zone I and IWPA:

- ✓ Prohibit parking in the space immediately adjacent to the wellhead.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I and monitor the area for spills and leaks.
- ✓ Post drinking water supply signs at key location such along the access road and in the turnaround near the building, away from the well.
- ✓ Provide information to staff and immediate neighbors about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Continue the current practice of not using fertilizer or pesticides.
- ✓ Use Best Management Practices (BMPs) for household hazardous products.

### Facilities Management:

- ✓ Septic system components should be maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Do not allow snow to be piled on top of the wellhead.

### Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓ Request that your IWPA be incorporated into the Leverett Aquifer Protection District.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Grant Program Fact Sheet

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**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**For**  
**Pearl E. Rhodes Elementary School**

**What is SWAP?**

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

**SWAP and  
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 12, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	Pearl E. Rhodes Elementary School
<i><b>PWS Address</b></i>	Brattleboro Road
<i><b>City/Town</b></i>	Leyden, Massachusetts
<i><b>PWS ID Number</b></i>	1156001
<i><b>Local Contact</b></i>	Dayle Doiron
<i><b>Phone Number</b></i>	(413) 498-2911

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well No. 1	1156001-01G	177	472	High

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes:**

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

**1. Description of the Water System**

The Pearl Rhodes Elementary School is located in the town of Leyden, a small hilltown in western Massachusetts on the Vermont border. The school has a student and staff population of approximately 100 people. There are no municipal water or wastewater systems in Leyden; therefore the school is served by one on-site water supply well and on-site septic disposal system. The well for the school is located on the east side of Brattleboro Road within the school basement boiler room. The well is a 6-inch diameter, 150 feet deep bedrock well that was hydrofractured in 1991 to enhance water flow to the well.

The area is in the Berkshire/Taconic foothills with relatively steep brook and river



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

valleys. The surficial geology is generally thin till with some minor alluvial deposits in the steam valleys. There are numerous bedrock outcrops in the area. The bedrock is mapped as the Lower Conway formation, a schist, equivalent to the Goshen Formation, with interbeds of quartzite and marble. There is no evidence of a protective clay layer or thick till to prevent activities on the ground surface from threatening the water supply. Therefore, the aquifer is identified as having a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The Zone I is the area immediately around the well that is most vulnerable. The Zone I for a well is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the system require DEP approval and compliance with Zone I restrictions. Well No. 1 has a Zone I radius of 177 feet and an Interim Wellhead Protection Area (IWPA) radius of 472 feet. The Zone I was based on the maximum daily water use as determined from metered water data.

The well serving the school has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **Elementary School;**
3. **Transportation corridors;**
4. **Fuel oil storage; and**
5. **Residential Land Uses.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Yes	Yes	Moderate	Spills, leaks, or improper handling of fuel oil from school and surrounding residences
Lawn Care / Gardening	Yes	Yes	Moderate	Over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Yes	Yes	Moderate	Nitrates, microbial contaminants, and improper disposal of hazardous chemicals
School	Yes	Yes	Moderate	Fuel oil, laboratory, art, and other chemicals: spills, leaks, or improper handling or storage
Roads	Yes	Yes	Moderate	Fuels and other hazardous materials: accidental leaks or spills; road salt usage
Manure Storage or Spreading	No	Yes	High	Manure (microbial contaminants, nitrates): improper handling/application

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related or other non-threatening activities in Zone I. The school's Zone I contains school buildings, fuel oil storage, boiler room, roads/driveways, parking areas, and athletic fields. The school does not own and/or control all land encompassed by the Zone 1. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers, or road salt within the Zone I.

**2. School** – Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or improperly disposed into septic systems.

### School recommendations:

- ✓ Implement BMPs that can be used to reduce the risk of contamination.
- ✓ Provide source protection education for maintenance staff, food preparation staff, teachers and students.

**3. Transportation Corridors** – Brattleboro Road is located within the Zone I and IWPA. Greenfield Road is also located within the IWPA. Roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA's are included in Emergency Response Planning.
- ✓ Request that the town apply low volumes of salt to those portions of Brattleboro Road and Greenfield Road that are within the IWPA.

### 4. Fuel Oil Storage – Aboveground Storage Tank (AST) –

The UST fuel oil tank was replaced with an AST with containment. If managed improperly, Aboveground Storage Tanks and fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store.

### Recommendations:

- ✓ Any modifications to the AST must be accomplished in a manner consistent with Massachusetts plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Monitor deliveries of oil as many spills are related to delivery.

**5. Residential Land Uses** – At least one residential property falls within the IWPA. All residences in the area have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination

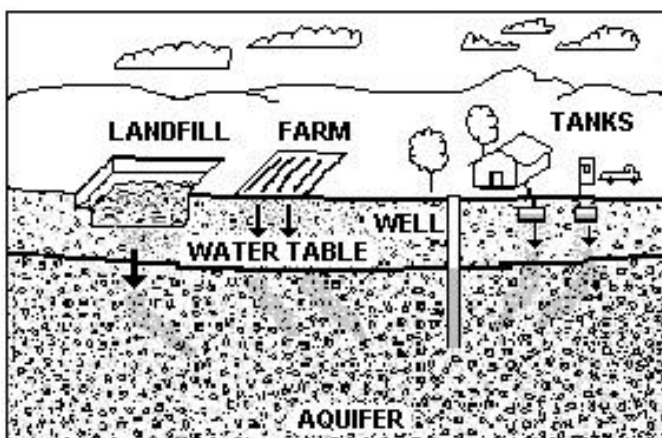


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

include:

- ♦ **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- ♦ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- ♦ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- ♦ **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at [www.ma.gov/dep/brp/dws/protect.htm](http://www.ma.gov/dep/brp/dws/protect.htm), the DEP website. The fact sheet provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

Implementing the following recommendations will reduce the system's susceptibility to contamination. Reportedly there is manure spreading in the protection areas. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure piles and field application are potential sources of contamination to ground and surface water supplies. Work with hobby farmers by supplying them with information regarding protecting their own wells and the public water supply by encouraging the use of BMPs. For additional resources, refer homeowners, conservation commissioners and planners to the DEP websites: <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> resources.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Pearl Rhodes Elementary School is commended for removing the fuel oil underground storage tank (UST) and replacing it with an aboveground tank (AST) with containment. Pearl Rhodes Elementary School is also commended for not using pesticides and fertilizers on its athletic fields. Pearl Rhodes Elementary School should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers, or road salt within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Post the Zone I area with “Public Drinking Water Supply Recharge Area” signs at appropriate locations away from the actual well.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.

- ✓ Consider well relocation if Zone I threats cannot be mitigated or if water quality is impacted by activities.
- ✓ If the school intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Monitor sodium concentrations in well water and use the sodium concentration trend as an indication as to whether or not increased efforts need to be made to reduce salt usage in the Zone I and IWPA and to work with the town on additional improvements to parking lot and road drainage.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Consider upgrading the heating system to propane for the purpose of removing fuel oil storage from the Zone I.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the actual well.
- ✓ Incorporate groundwater education into the school curriculum.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Very Small Quantity Generators.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Healthy Schools Fact Sheet

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
PIONEER VALLEY YACHT CLUB



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 2, 2004

## What is a SWAP Report?

The Source Water Assessment Program (SWAP) established under the federal Safe Drinking Water Act requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The determinations of susceptibility of your well/source(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Pioneer Valley Yacht Club
<i>PWS Address</i>	260 Anthony Rd
<i>City/Town</i>	Longmeadow, Massachusetts
<i>PWS ID Number</i>	1159001

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1159001-01G	100	403	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant activities* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

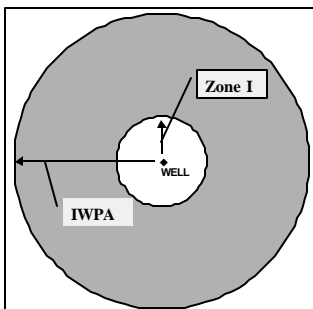
Susceptibility is a measure of your well's potential to become contaminated by activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant activities is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

A well's *susceptibility* to contamination is different from the *risk* of a customer drinking contaminated water. Water suppliers protect against such risk through monitoring and treatment of water supplies, BMPs, and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1159001-01G)**

Zone I = 100 ft.  
IWPA = 403 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the presence of septic leach fields within the Zone I / IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of oil, underground storage tanks, parking areas, vehicle maintenance areas, local roads, and agricultural activities within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

## For WESTOVER GOLF COURSE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

### What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Westover Golf Course
<b>PWS Address</b>	488 Chapin St
<b>City/Town</b>	Ludlow, Massachusetts
<b>PWS ID Number</b>	1161004

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1161004-01G	126	433	High	High
Well #2	1161004-02G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

### What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

### What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

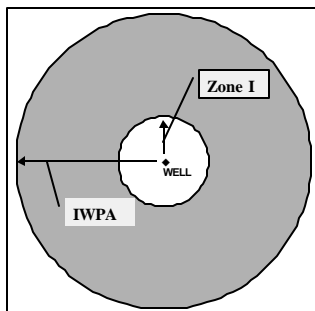
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1161004-01G)**

Zone I = 126 ft.  
IWPA = 433 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone Is and/or the IWPA's. The **high** susceptibility to potential non-microbial threats is based on the above and underground storage tanks for hazardous materials such as diesel fuel, gasoline and heating oil and storage and use of other hazardous materials such as fertilizers and pesticides. Moderate threat activities that are within the Zone Is and the IWPA's are parking, buildings and access roads.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Monroe Bridge Water District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	<b>Monroe Bridge Water District</b>
<b>PWS Address</b>	<b>P.O. Box 75</b>
<b>City/Town</b>	<b>Monroe, Massachusetts</b>
<b>PWS ID Number</b>	<b>1190000</b>
<b>Local Contact</b>	<b>Mr. Mark Simon</b>
<b>Phone Number</b>	<b>802-793-2691</b>

### Surface Water Source

*System Susceptibility*

*Moderate*

<b>Source Name:</b>	<b>Source ID</b>	<b>Susceptibility</b>
Phelps Brook	1190000-01S	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### **Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### **This report includes:**

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Monroe Bridge is a village within the Town of Monroe. Monroe is the smallest town in Franklin County and is relatively isolated in the rugged Berkshire Hills of northwestern Massachusetts on the Vermont border. Monroe developed in the 1800's as an agrarian

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

community until hydroelectric power and the paper industry developed in the late 1800's and early 1900's. Today Monroe is primarily a residential and tourist (recreational) community. The Monroe Bride Water District maintains and operates a single surface water source, Phelps Brook. The system has a dam, ponding the brook to create a small reservoir and serves approximately 31 homes in the village.

Phelps Brook has a relatively small watershed of approximately 517 acres, with steep to very steep sides in the brook valley. The brook discharges into the Deerfield River southeast of the Monroe Bridge intake and just south of the Sherman Reservoir along the Deerfield River. The overburden in the watershed is primarily thin till over bedrock with abundant bedrock outcrops. There are some small deposits of recent alluvium and swamp deposits near the headwaters of the brook where the topography is somewhat less steep. The bedrock in the watershed is mapped as the metamorphic equivalents of allocthonous volcanic and sedimentary rocks east of the Berkshire highlands. The rocks are primarily schist and gneiss of the Hoosac Formation and the structural geology is a complex series of folds and faults. Surface water supplies, by their nature, are considered to be highly vulnerable to contamination from the surface because there is little buffer of protection of the source.

Water from the brook is filtered through a slow sand filter, followed by the addition of soda ash to adjust the pH for corrosion control and chlorine for disinfection prior to distribution. For current information on water quality monitoring results, please refer to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone A, B and watershed outline and Table 2 for additional information regarding activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Zone A activities,**
2. **Transportation corridors,**
3. **Residential land uses, and**
4. **Agricultural uses.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridors	Yes	Yes	Moderate	Limit road salt usage. Investigate and work with the Town to control erosion and runoff
Residential use	No	Yes	Moderate	Septic and household hazardous materials
Agriculture	Yes	Yes	Moderate	Hobby/commercial farming.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one land use or activity ranked as moderate in the Zone A and watershed, as seen in Table 2.

**1. Activities in Zone A** - The Zone A includes all areas within 400 feet around the reservoir and within 200 feet of either side of all streams that flow into the intake reservoir. Land use activities within a Zone A may have an impact on surface water sources. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. while road runoff can carry other contaminants. There are local roads and small parking areas in the Zone A of the system's reservoir and brook.

### Zone A Recommendations:

- V Continue to monitor and protect the Zone A and prohibit any new threatening activities from the Zone A.
- V Continue the use of Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store petroleum products, pesticides, fertilizers or road salt within the Zone I.
- V Work with local emergency response teams to ensure that any spills within the protection areas, especially the Zone A, can be effectively contained. Be sure that the local emergency response team is aware of the source location.

**2. Residential Land Uses** – There are numerous residences within the watershed. If managed improperly, activities associated with residential areas can contribute to drinking water contamination

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. Groundwater ultimately discharges to surface water bodies – streams, ponds and brooks. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catchbasins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and online at the website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm). The fact

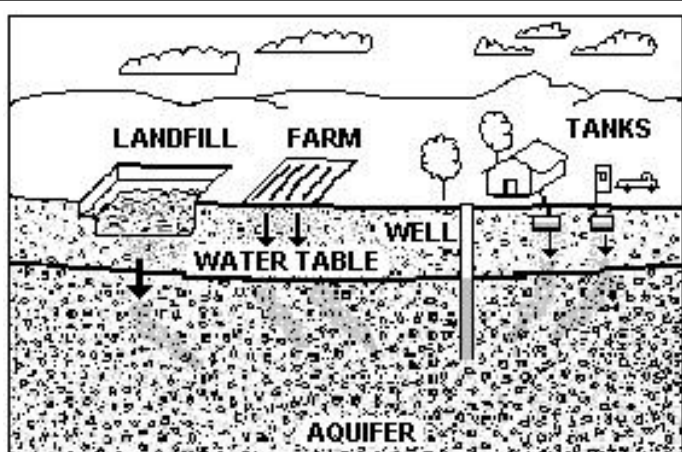


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

sheet provides BMPs for common residential issues.

- V Consider long-term options of negotiating fee simple purchase, Right of First refusal agreement, conservation restrictions and Memorandum of Understanding for land not currently owned or controlled by the District.

**3. Transportation corridors and right-of-way** - There are very steep roads located within the watershed of Phelps Brook. In fact, some of the roads are closed in the winter. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater. Roadways can often be sites for illegal dumping of hazardous or other potentially harmful wastes. There is also a utility right-of-way through the watershed that likely is maintained for vegetation control.

Catchbasins and drainage swales transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, pet waste, pesticides and fertilizers or accidental spills. Phelps Brook is subject to very flashy response because of the nature of the watershed.

#### Transportation Corridor Recommendations:

- V Regularly inspect Zone A and the watershed for illegal dumping and spills.
- V Work with local emergency response teams to ensure that any spills within the protection areas, especially the Zone A, can be effectively contained. Be sure that the local emergency response team is aware of the source location.
- V Where catchbasins or stormwater structures are installed, work with the municipality or State to have them inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- V Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- V Promote BMPs for stormwater management and pollution controls.
- V Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Rita Thibodeau, at the local office (Greenfield at 413-772-0384 - e-mail address is [rita.thibodeau@magreenfie.fsc.usda.gov](mailto:rita.thibodeau@magreenfie.fsc.usda.gov)). Review the fact sheet online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- V Visit DEP's Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>

#### Rights-of-way Recommendations:

- V Request that the Conservation Commission or Selectmen reviewing the right-of-way Yearly Operating Plan (YOP) for utilities, ensure they continue use of only manual control of vegetation and that the utility has accurate information regarding the locations of the protection zones. Review the maps that the utilities use with the town officials.
- V Work with local emergency response planners. Be sure that local emergency response teams are aware of the protection areas and coordinate Emergency Response Drills.

**4. Agricultural Activities** – The watershed includes a small percentage, approximately 5%, of land with agricultural activities. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Frequently, farms have maintenance garages for equipment and storage tanks.

#### Agricultural Activities Recommendations:

- V Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online at the website - <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.and call the local office of the NRCS in Greenfield for assistance.



- ✓ Encourage farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at the website: <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance. This recommendation may be appropriate for the Monroe highway superintendent or Selectmen.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to the websites at <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will reduce the supply's susceptibility to contamination. The District should continue efforts to protect water supplies by reviewing and adopting the key recommendations above and the following:

#### **Priority Recommendations:**

- ✓ Work with the town to address stormwater runoff issues in the watershed.
- ✓ Consider purchase of development rights through Conservation restrictions on land in the Zone A and watershed that are critical for protection.

#### **Zone A:**

- ✓ Prohibit any new non-water supply activities from Zone A areas that are within your control.
- ✓ When feasible, remove all non-water supply activities from the Zone A to comply with DEP requirements.
- ✓ Conduct regular inspections of the Zone A. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If it is not feasible to purchase privately owned land within the Zone A at this time, consider a conservation restriction or Memorandum of Understanding (MOU) that would prohibit potentially threatening activities or a Right of First Refusal agreement to purchase the property.
- ✓ Periodically inspect road drainage in the Zone A.
- ✓ Do not use or store pesticides, fertilizers, petroleum products or road salt within the Zone A.

#### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operators. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations as appropriate.
- ✓ Work with your community to ensure that stormwater runoff is managed to minimize erosion and is treated according to DEP guidance.

#### **Facilities Management:**

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

#### **Planning:**

- ✓ Review plans to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet
- Other Source Protection information

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Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Monson Water and Sewer Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Monson Water and Sewer Department
<i><b>PWS Address</b></i>	198 WD Main Street, P.O. Box 388
<i><b>City/Town</b></i>	Monson
<i><b>PWS ID Number</b></i>	1191000
<i><b>Local Contact</b></i>	Craig Jalbert
<i><b>Phone Number</b></i>	413-267-4130

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

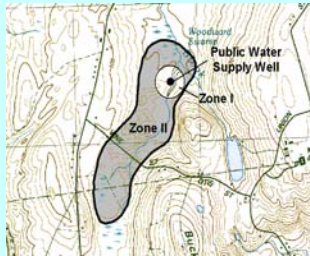
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone II #: 558**

**Susceptibility:** High

Well Names	Source IDs
Bethany Road Well	1191000-03G
Lower Palmer Road Well	1191000-04G
Bunyan Road Well	1191000-05G

Monson is a relatively small community of approximately 7,500 in western Massachusetts along the Connecticut border. The town originally developed as a textile center and later added other manufacturing. The community is primarily in the west central Massachusetts highlands with the town center and the majority of the development concentrated along the narrow Chicopee Brook valley that bisects the community running south to north. Monson Water and Sewer Department maintains three active groundwater sources supplying water to approximately half of the town of Monson's population. The Bunyan Road well, the primary source for the town, is in the northern part of town west of Route 32 along the wetland area of Chicopee Brook, and is an 18x24-inch diameter, 80-feet deep, gravel-packed well. The Bethany Road and Palmer Road wells are located about 500 feet apart, north of the center of town, east of Route 32. The Bethany Road well is a 16x24-inch diameter, 54-feet deep, gravel-packed well installed in 1950. The original Palmer Road well is a 16x24-inch, 78-feet deep, gravel-packed well that is used as a back-up source to the Bunyan Road well. Records indicate a 12-inch diameter gravel developed replacement well was installed adjacent to the original Palmer Road well. Each well has a Zone I of 400 feet. All three wells are located within the same buried valley aquifer along the Chicopee Brook and the Zone II, recharge area was delineated for all three wells as part of the SWAP program. The Water and Sewer Department does not own the entire Zone I for the wells. Please refer to the attached map for location details.

The three wells are located within a glacially deepened, bedrock valley along the Chicopee Brook. The stagnant, receding (melting) glacier deposited the overburden materials that filled the bedrock valley some 10,000 years ago. The deposits are a complex series of coarse and fine-grained material referred to as outwash deposits. A temporary glacial lake left thick clay deposits in some areas, while fast moving meltwater left sinuous, coarse gravel deposits (eskers) or flat topped delta or terrace features amid the fine-grained deposits. Recent stream waters have reworked the deposits and deposited alluvium throughout the area. The Bethany and Bunyan Road wells are located within a coarse gravel, esker deposit while the Palmer Road well is located within other, finer grained outwash deposits. There is no evidence of a continuous, protective clay layer through the Zone II. Wells located in this type of aquifer are considered to have a high vulnerability to potential contamination from the surface due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. According to USGS mapping, the area is underlain by Monson Gneiss, a texturally mixed, layered plagioclase-quartz-biotite gneiss. There are also two wells and two surface water sources that are either abandoned or emergency sources, and are not addressed in this report. Please refer to the attached map to view the boundaries of the Zones I and II.

Soda ash is added to the water from the Bunyan Road well to control pH and alkalinity for corrosion control prior to distribution. The water from the other

wells does not require and is not treated at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Monson Water and Sewer Department is a mixture of residential, commercial, agricultural, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B. Please note that the GIS map show a solid waste disposal area on the northwest edge of the Zone II. The Department's Bureau of Waste Prevention conducted a site visit as part of this assessment. The Department did not find any evidence of a waste disposal site in the vicinity and intends to delete the site from the Department's database and map.

### Key Land Uses and Protection Issues include:

1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning
7. Agricultural activities
8. Railroad Tracks

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Nonconforming Zone Is** – The Zone I for each of the wells is a 400-foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply

activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. Monson Water and Sewer Department does not own the Zone Is for the Bethany Road and Palmer Road wells. The Zone I for the Bethany Road well contains roads and two residences.

### Zone I Recommendations:

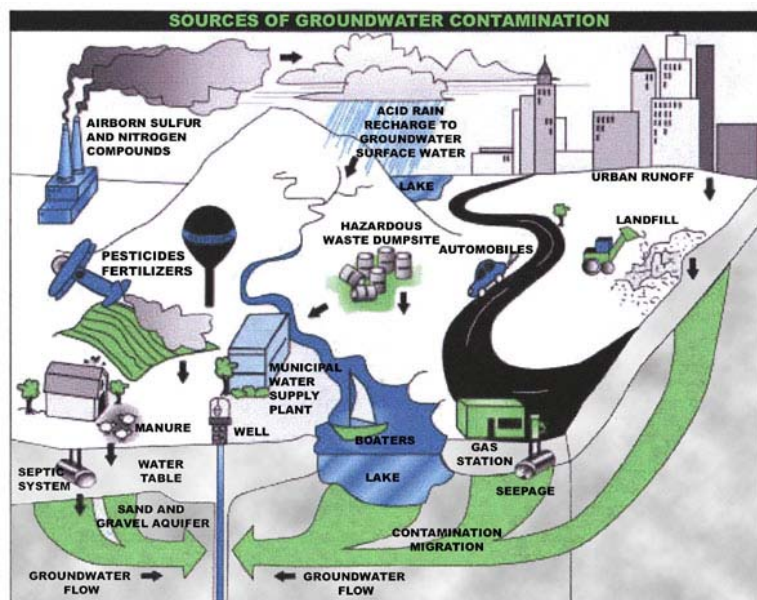
- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

**2. Residential Land Uses** – Approximately 27% of the Zone II consists of residential areas. The town's sewer services the northern half of the Zone II, where much of the residential area is located. Septic systems service residences and businesses located south of Cedar Swamp Road and Route 32, the southern half of the Zone II. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Route 32 runs through the length of the Zone II, and local roads are common

throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**Source Protection Decreases Risk**

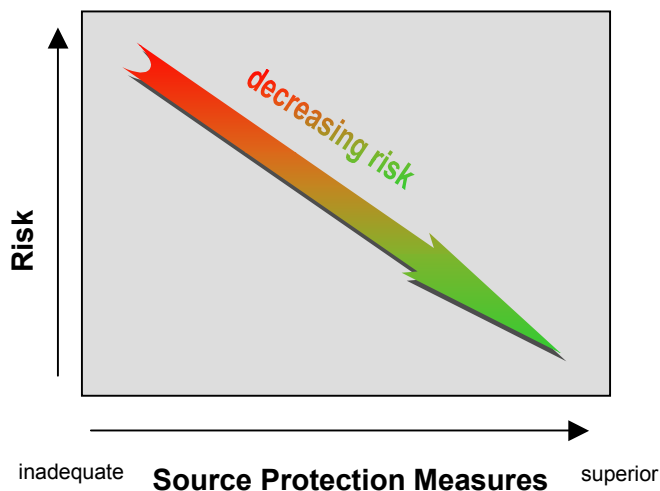


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Fertilizer Storage or Use	2	M	Fertilizers: leaks, spills, improper handling, or over-application
Forestry Operation	1	L	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	3	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>			
Car/Truck/Bus Washes	1	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management (sewered)
Gas Stations	3	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	8	H	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	5	H	Fuels and maintenance chemicals: spills, leaks, or improper handling
Cemeteries	6	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Funeral Homes	1	L	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	1	M	Fertilizers or pesticides: over-application or improper handling
Laundromats	1	L	Wash water: improper management (sewered)
Medical Facilities	1	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (sewered)
Railroad Tracks And Yards	Through Zones I & II	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances, Etc.)	1	H	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Industrial</b>			
Fuel Oil Distributors	1	H	Fuel oil: spills, leaks, or improper handling or storage
Machine Shops	3	H	Solvents and metal tailings: spills, leaks, or improper handling
RCRA TSDF Facilities	1	H	Hazardous wastes: spills, leaks, or improper handling or storage

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cess-pools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal (sewered north of Robins St., Maple St.)
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Numerous	L	Microbial contaminants
Fishing/Boating	Numerous	L	Fuel and other chemical spills, microbial contaminants (mainly canoes)
Pipeline: Gas and Sewer	2	M	Natural Gas or Sewage: spills or leaks
Road And Maintenance Depots	1	M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools	2	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage (sewered)
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: Railroad, Natural Gas	2	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	Numerous	H	Stored materials: spills, leaks, or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Hazardous Materials Storage and Use** – Five percent of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local businesses through the Board of Health, to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains several DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0011017, 1-0000487, and 1-0013024. Refer to the attached map and Appendix C for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites. Contact the Department's Bureau of Waste Site Cleanup at 413-784-1100 for further information.

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water is a place people want to live and businesses want to locate.



**6. Agricultural Activities** – Six percent of the land use within the Zone II is agricultural as pasture or cropland. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with hobby farmers to encourage the use of valuable assistance from soil conservation districts regarding BMPs.

**7. Protection Planning** – Currently, the Town does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are competitive grant funding resources available to help communities develop a plan for protecting drinking water supply wells. Department staff is also

available to assist communities in developing local wellhead protection controls.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**8. Railroad Right-of-Way** – The railroad runs through the entire Zone II, and transects the Zone I of all wells. Rail corridors that serve passenger and/or freight trains are a potential source of contaminants due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of a railroad right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on railroad right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train/track

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

maintenance chemicals are also potential sources of contamination to the water supply.

**Railroad Right of Way Recommendations:**

- ✓ Review the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses and supply them with an accurate map as appropriate.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the railroad rights-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II

- ✓ and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Supply information about BMPs for hobby farmers regarding pesticides, manure management.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

#### **Additional Information**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	The Town "Aquifer Protection District" bylaw meets DEP's best efforts for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>SOME</b>	For guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Include commercial, industrial and municipal uses within the Zone II. Utilize schools and public access channels.



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
SPRINGFIELD SPORTSMANS CLUB INC.



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
May 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Springfield Sportsmans Club Inc.
<i>PWS Address</i>	Woodhill Rd
<i>City/Town</i>	Monson, Massachusetts
<i>PWS ID Number</i>	1191003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Club House Well #1	1191003-01G	100	406	High	Moderate
Skeet House Well #2	1191003-02G	100	406	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

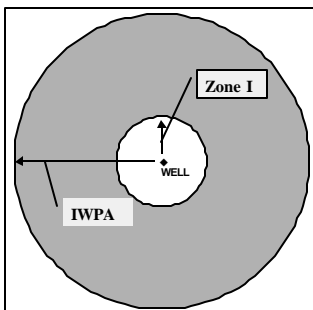
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA EXAMPLE** Source Protection Area for Club House Well #1 (1191003-01G)

Zone 1 = 100 ft.  
IWPA = 406 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic leach fields within the Zone I / IWPA's. The **moderate** susceptibility to potential non-microbial threats is based on the parking areas and the facility within the Zone I and/or the IWPA's.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- 3 inspect the Zone I and IWPA regularly;
- 3 work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- 3 restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- 3 make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- 3 remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- 3 do not use pesticides, fertilizers or road salt within the Zone I;
- 3 address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- 3 water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

## For ASYLUM HEALTH & RACQUET CLUB



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

### What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Asylum Health & Racquet Club
<b>PWS Address</b>	Boston Rd
<b>City/Town</b>	Monson, Massachusetts
<b>PWS ID Number</b>	1191011

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1191011-01G	124	432	Moderate	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

### What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

### What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

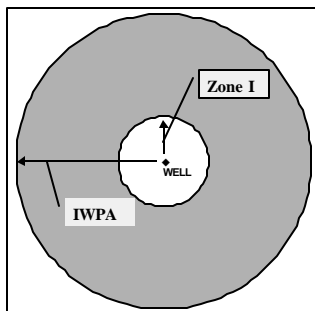
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1191011-01G)**

Zone I = 124 ft.  
IWPA = 432 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **high** susceptibility to potential non-microbial threats is based on the railroad tracks; moderate threat activities within the IWPA include commercial facilities, parking and roads.

This source water assessment report is based on information provided by you on your New Source Approval report, Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Turner's Falls Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Turner's Falls Water Department
<i>PWS Address</i>	226 Millers Falls Road
<i>City/Town</i>	Montague
<i>PWS ID Number</i>	1192000
<i>Local Contact</i>	Mr. Michael S. Brown
<i>Phone Number</i>	413-863-4542

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices



## What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*System Susceptibility:*

*High*

### *Groundwater Sources*

<i>Zone II # 206</i>	<i>Susceptibility: High</i>
Well #1 and Satellite well	1192000-01G
Well #2	1192000-02G

Turner's Falls is one of several villages within the Town of Montague, an industrial/agricultural and growing, rural residential community in western Massachusetts. Turner's Falls Water Department maintains two groundwater sources for the village's drinking water supply: Well #1 and its satellite well (1192000-01G) and Well #2 (1192000-02G). Source 01G consists of Well #1, a 26x34-inch diameter gravel packed well and an 8-inch diameter gravel developed well that withdraw water from a confined aquifer located in the central part of town. The wells (01G) serve as the main supply, are approximately 115 and 110 feet deep, respectively and have a combined, historical pumping capacity of approximately 765 gallons per minute (gpm). Well #2 (02G) is a 187-foot deep, 18 x 36-inch diameter gravel packed well, installed in 1992. Well #2 has an approved withdrawal rate of 1,500 gpm. The wells are located within a deep, pre-glacial, buried valley sand and gravel aquifer that is confined in the immediate vicinity of the wells but partially confined throughout other portions of the aquifer. Due to the presence of iron and manganese in the water, the well water is chlorinated and filtered through green sand filters that are periodically injected with potassium permanganate. The Zone II for Well #2 was delineated through the new source approval process utilizing hydrogeologic mapping and analytical modeling. Well #1 and the satellite well were incorporated within that Zone II through the SWAP program. The Department also maintains the Lake Pleasant and Green Pond reservoirs as emergency sources. These sources will not be further assessed within this report.

The wells are located within a glacially deepened, bedrock valley that was buried with sand, gravel and in some areas clay during the recession (melting) of the glaciers some 10,000 before present. Meltwater laid down coarse sand and gravel that was overlain with fine silt and clay where glacial lakes were formed. Glacial Lake Hitchcock was formed through much of the Connecticut River valley from southern Vermont to central Connecticut. Sediment laden meltwater deltas such as the Montague Plains, were formed into the lake leaving coarse grained materials at the deltas and along the shoreline. Finer grained deposits were carried to deeper quiescent waters and settled to the lake bottom forming the aquifer's confining clay unit. After the glacial lake drained, more recent deposits were laid down over the clay unit. The wells are located within the confined portion of the aquifer however, boring logs show evidence of unconfined areas along the boundaries of the aquifer. The aquifer is considered to be highly vulnerable to contamination because although the wells are located beneath a protective clay unit, the clay is discontinuous and does not exist throughout the majority of the recharge area of the aquifer to the south and along the edges of the aquifer.



Each well has a 400 feet protective Zone I radius. Aquifer parameters were determined from multiple, extended duration pumping tests and the Zone II for the wells was delineated based on conceptual and analytical modeling in conjunction with geological mapping. Please refer to the attached map to view the boundaries of each Zone II. For current information on water quality monitoring results, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The land uses within the Zone IIs of the Turner's Falls wells are a mixture of commercial, residential and agricultural areas (refer to attached map for details). Although some areas of Montague are served by the Town municipal sewer system, the entire Zone II area is served by on-site septic disposal. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Tables of Regulated Facilities attached in Appendix B.

### Key Land Uses and Protection Issues include:

1. Residential land uses
2. Transportation corridors
3. Hazardous materials storage and use
4. Underground Injection Control
5. Protection Planning
6. Agricultural activities
7. Sewer Pipeline and Wastewater Treatment Facility

Although there are many safeguards in place, the overall susceptibility ranking to contamination of the groundwater supplies is high, based on the presence of numerous high ranking threat land uses within the Zone II water

supply protection areas, as seen in Table 2.

Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to control the Zone I through ownership or some other mechanism such as a conservation restriction. Only water supply activities are allowed in the Zone I. The Turner's Falls Water Department owns the entire Zone I for both sources. The MA DEP commends the Water Department for its proactive approach to source protection by installing secondary containment in the well house as a result of this assessment and closing out a floor drain.

✓ Continue your current use of BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals and monitor all chemical deliveries.

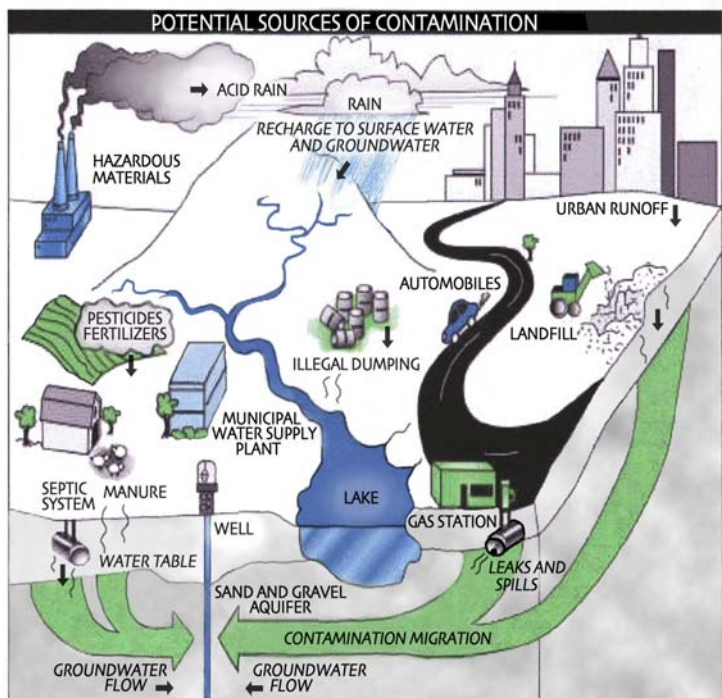
### 2. Residential Land Uses – Approximately 11% of the Zone II area

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

consists of residential land use. Although some of the community is served by municipal sewer, the entire Zone II utilizes on-site septic disposal. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper maintenance and disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems discharge directly to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include petroleum products for automotive and lawn care, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.



#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Continue working with Town planners to manage and control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Continue catch basin cleaning routines.

**2. Transportation Corridors** – The Zone II has numerous roads throughout. State Route 63 run along the eastern edge of the Zone II and a portion of Route 47 runs through the southern portion of the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes and de-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

#### **Transportation Corridor Recommendations:**

- ✓ **Emergency response**—Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained and be sure that the Emergency Responders are aware of the recharge area and will notify the Water District in the event of an emergency.
- ✓ **Low Salt Areas** - Submit a formal request to MA Highway Department to establish Low Salt Areas along Route 63 and 47 and consider this same request for local Montague roads. Educate employees and private contractors of the restrictions in designated Low Salt Areas if they are designated.

#### **What are "BMPs?"**

Best Management Practices are structural (i.e. oil & grease trap catch basins), nonstructural (i.e. hazardous waste collection days) or managerial measures that are used to protect and improve surface water and groundwater quality.

- ✓ **Planning and Developing** - Be aware of EPA's Intermodal Surface Transportation Efficiency Act. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 contains provision for the planning and developing of highway systems and transportation enhancement activities, including the mitigation of water pollution due to highway runoff. Through ISTEA, states are able to use a portion of their federal funding allotment for runoff pollution control devices and other BMPs to prevent polluted runoff from reaching their lakes, rivers, and bays. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 3: Land Uses and Activities in the Protection Area**

For more information, refer to Appendix 2: Regulated Facilities within the Water Supply Protection Area or immediately adjacent to the area.

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Fertilizer Storage or Use — Crop land	Numerous	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use—Crop land	Numerous	H	Pesticides: leaks, spills, improper handling, or over-application
Livestock Operations	2	M	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	Numerous	H	Manure (microbial contaminants): improper handling
<b>Commercial</b>			
Service Stations/ Auto Repair Shops	2	H	Automotive fluids and solvents: spills, leaks, or improper handling
Furniture Stripping and Refinishing/ Window refurbishing	1	H	Hazardous chemicals: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	Fuels and maintenance chemicals: spills, leaks, or improper handling
Car/Truck/Bus Washes	1	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Sand And Gravel Mining/Washing	3	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling
Clandestine Dumping/ junkpiles	1	H	Debris containing hazardous materials or wastes
NPDES Locations	1	L	Various depending on discharge limits
UIC Sites	2	--	Owners are currently conducting closure; contact the regional coordinator for status and information.
Small quantity hazardous waste	Numerous	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	Unknown	H	Stored materials: spills, leaks, or improper handling

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from leaks, maintenance, washing or accidents.

**Stormwater Catch Basins – Recommendations:**

- ✓ **Mapping** - If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to prioritize and investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ **Inspect, Maintain, and Clean** - Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in runoff. Note: Catch basin cleanings are classified as solid waste by DEP and must be handled and disposed in accordance with all regulations, policies, and guidance. In the absence of written approval from DEP, catch basin cleanings must be taken to a facility permitted by DEP to accept solid waste. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity see: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ **Best Management Practices** - Work with the Town to develop Best Management Practices that are the most

effective, practical means of preventing or reducing pollution from nonpoint sources. Information is available at <http://www.epa.gov/OWOW/NPS/roads.html>.

- ✓ **Local Controls** - Encourage local officials to develop a local stormwater ordinance. For more information see <http://www.epa.gov/owow/nps/ordinance/stormwater.htm>.
- ✓ **Storm Drain Stenciling Program** - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ **Wellhead Protection Grants** – Consider applying for a Wellhead Protection Grant from DEP for the purpose of addressing stormwater drainage in the Zone II, and for working with the Town to address the “Phase II Stormwater Regulations”.

**3. Hazardous Materials Storage, Use and Disposal** – Commercial, industrial and mining land uses make up about 8% of the Zone II. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system, through a floor drain leading directly to the ground or directly to the ground. Unmanaged junkpiles and illegal disposal sites pose a significant threat to the environment.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Work with the local Board of Health to educate local businesses on Massachusetts’ floordrain requirements. See brochure “Industrial Floor Drains” for more information and in development and implementation of Local floor drain regulations and Hazardous Materials handling regulations.
- ✓ Work with the local Board of Health to develop local by-laws for hazardous materials handling and develop an inspection program for facilities that handle, use, store or dispose of hazardous materials.

**4. Underground Injection Control** – The Zone II contains two open-ended DEP sites related to illegal disposal of waste through a floor drain or dry well. Refer any questions to the UIC Coordinator at the WERO in Springfield or Tony Zaharias 413-755-2122.

**UIC Sites Recommendation:**

- ✓ Monitor progress on any ongoing testing and potential remedial action conducted for the known oil or contamination sites.

**5. Protection Planning** – Although the District is in the process of updating the Emergency Response Plan, there are no current plans for developing a protection plan. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The development of a successful Wellhead Protection Plan is outlined in five steps in DEP’s “Developing a Local Wellhead Protection Plan” (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Wellhead Protection Area
- Identify potential sources of contamination
- Protect and manage the wellhead protection area
- Conduct ongoing public education and outreach

The Town does have an Aquifer Protection District By-law, and has requested that the Planning Board amend the by-law to comply with supply protection control regulations 310 CMR 22.21(2). The Town Planner did participate in the SWAP assessment and was instrumental in data acquisition..

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/>



dws/protect.htm for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".

- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**6. Agricultural Activities** – Crop and pasture lands make up 23% of the Zone II area. In addition there are numerous hobby farmers within the Zone II and Zone III area. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. Improper management of hazardous materials pose a potential threat to the groundwater. In some instances, farmers have on-site irrigation wells or use town water for animals or crops.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Where appropriate, ensure farmers use back-flow prevention devices for connections to public water supplies but also for on-site wells. Inform farmers of BMPs for sanitary seals and back flow prevention for any on-site wells.

Other land uses and activities within the Zone II that have potential for contamination include utility Right-of-way, railroad tracks. Refer to Table 2 and Appendix 2 for more information about these land uses.

**Top 5 Reasons to  
Develop a Local Wellhead  
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

Although the Zone II contains numerous existing and potential sources of contamination, awareness and source protection measures reduces the risk of actual contamination, as illustrated in Figure 2. Identifying additional potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when install containment for all chemicals stored and used within the Zone I of the wells.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the boundaries of the Zone II, stormwater drainage in your Zone II and



- ✓ Zone III when responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Communicate with owners/operators of the rights-of-way to ensure Best Management Practices are being used
- ✓ Develop and implement a comprehensive Wellhead Protection Plan.

➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents, the municipal services and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is planning, local include such as the adoption of local controls to protect land use regulations related to watersheds and ground water., These controls may include health ordinances/regulations, no discharge prohibitions general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. These recommendations are only part of your ongoing local drinking water source protection.

➤ **Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

**Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection

priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>Partially</b>	The Town's "Aquifer Protection District" by law has recently been updated and meets DEP's best efforts for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model by laws and health regulations, and current regulations for any future updates.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with neighboring municipality of Sunderland to include portions of the Zone II in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . Include the Montague Center Water District in community planning efforts.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>In progress</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Develop a committee as part of the wellhead protection planning process. Include modification and improvement of existing by laws, regulation and inspection programs as appropriate.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
134176	Stone's Equipment Repair	Federal Street	Montague	Generator of Hazardous Waste	Very Small Quantity Generator	Auto – Sales and Service
279722	Red Wing Meadow Trout Farm	North Leverett Road	Montague	Generator of Hazardous Waste	Very Small Quantity Generator NPDES	Fish Hatchery

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



# Source Water Assessment Program (SWAP) Report For Monterey Water Company

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Monterey Water Company</b>
<b>PWS Address</b>	<b>P.O. Box 17, Sandisfield Road</b>
<b>City/Town</b>	<b>Monterey, Massachusetts</b>
<b>PWS ID Number</b>	<b>1193000</b>
<b>Local Contact</b>	<b>Ken Heath, President</b>
<b>Phone Number</b>	<b>413-528-0722</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1193000-01G	274	720	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Monterey Water Company serves 58 homes and small businesses in the rural community of Monterey. The community is served by on-site septic disposal systems. Well #1 is a 364-foot deep rock well. An informal pump test in 1994 established an estimated yield for the source of 10-gallons per minute; the pump is set at a depth of approximately 145 feet. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 274 feet and 720 feet, respectively, based on that estimated yield. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The bedrock near this well is a fairly complex series of folds and faults, involving laminated gneissic metasandstone, metagraywacke, interbedded schists and predominantly carbonate rocks of the Stockbridge formation: quartzose, dolomite, and marble. Although there is no mapping of the overburden material, it is assumed to be till based on topography. There is no information regarding a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. The water from the well serving the facility has chlorine added as a disinfectant. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming use in Zone I;**
2. **Low density housing with septic systems; and**
3. **Electrical Transformers.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of few threatening land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming use in Zone I** - The Zone I for Well #1 is nonconforming with respect to DEP land use restrictions, that allow only water supply related activities in the Zone I. The public water supplier does not own and/or control all land encompassed by the Zone I of the well. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.
- ✓ Continue to keep a current emergency response plan for responding to an accidental release.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Roadways	Yes	Yes	Moderate	Prohibit parking along road, monitor activities
Low density housing	Yes	Yes	Moderate	Refer to septic system brochure attached
Electrical Transformers	Yes	Yes	Moderate	Request information regarding PCB in MODF change from your electric company

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**2. Low Density Housing --** The Zone I contains Sandisfield Road and one residence with associated parking and septic systems. The IWPA contains two additional homes. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. Another potential threat from residential users is mismanagement of household waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Monitor roadside for spills and leaks.
- ✓ Encourage residents to utilize local household hazardous waste collection days.
- ✓ Supply residents with information about BMPs for household hazardous waste management and lawn care.

**3. Electrical Transformer –** Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some transformers.

### Recommendations:

- ✓ Contact the local utility to determine if the transformers contain PCBs. If PCBs are present, urge the immediate replacement of oil.
- ✓ Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Monterey Water Company should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- V Consider well relocation of Well #1 if Zone I threats cannot be mitigated.

### Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Continue to prohibit public access to the well and pumphouse by maintaining locked facilities.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- V If it is not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- V Redirect road and parking lot drainage in the Zone I away from well.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator. Post labels as appropriate on raw materials and hazardous waste.

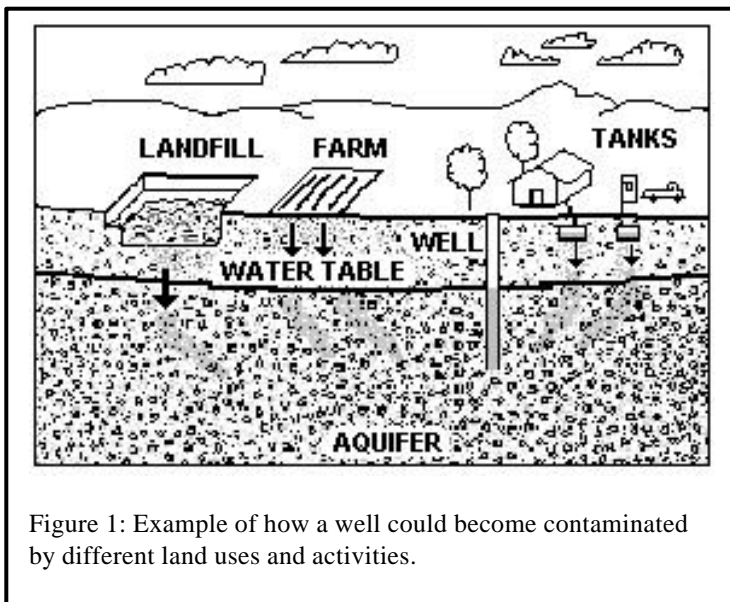


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba of the Western Regional Office at 413-755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- V Work with your community to ensure that stormwater runoff is directed away from the well along the roadway.

### Facilities Management:

- V Do not store or use hazardous materials within Zone I.
- V Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- V For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- V Work with local officials in Monterey to develop and include the Monterey Water Company IWPA in Aquifer Protection District Bylaws, and to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- V Consider obtaining a conservation restriction or "Right of First Refusal" for any land within Zone I that cannot be purchased.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response application package for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Wellhead Protection Grant Program Fact Sheet



# Source Water Assessment Program (SWAP) Report For Gould Farm

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
March 27, 2002

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>Gould Farm</b>
<b>PWS Address</b>	<b>P.O. Box 157, 100 Gould Road</b>
<b>City/Town</b>	<b>Monterey, Massachusetts</b>
<b>PWS ID Number</b>	<b>1193003</b>
<b>Local Contact</b>	<b>Daniel Cryns</b>
<b>Phone Number</b>	<b>413-528-1804</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1193003-01G	232	568	Moderate
Retreat Lodge Well	1193003-02G	163	459	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

## 1. Description of the Water System

Gould Farm is an agricultural, community living facility for people with special needs, located in Monterey. The community is served by a few on-site septic disposal systems and operates a wastewater lagoon for the majority of wastewater disposal. The lagoons are topographically downgradient of the wells and outside of the IWPA's. Well 01G is a 210-foot deep, 6-inch diameter well. The source has a safe yield of 9 gallons per minute based on historical metered data of the system. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 232 feet and 568 feet, respectively. The Retreat Lodge Well (02G) is a 6-inch diameter, 405-foot deep bedrock well, with 59 feet of casing grouted into bedrock with an approved pumping rate of 1.83 gpm, serves a single

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

retreat house for short-term visitors. The Zone I and IWPA radii for the Retreat Lodge Well are 163 feet and 459 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The facility also has an emergency, surface water supply (01S) that has been physically disconnected from the system and is not addressed in this report. It is our understanding that Gould Farm intends to officially abandon that source.

Both wells are bedrock wells, located in an area the USGS has mapped as quartzose schist. Geologic mapping identifies the bedrock as fairly complex structure of folding and faulting; there is a relatively thin layer of till often referred to as "hardpan", overlying the bedrock. There is no evidence of a confining clay layer in the area. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier such as clay to prevent surface contamination from migrating into the bedrock aquifer. The water does not require and is, at the time this report was prepared, is not treated. Ultra-violet light is utilized to disinfect the water prior to distribution. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming Activities in Zone Is;**
2. **Confirmed Hazardous Materials/Oil Release Sites;**
3. **Aboveground Storage Tanks (ASTs) With Heating Oil;**
4. **Sump pumps in basement.**

The overall ranking of susceptibility to contamination of both wells is moderate, based on the presence of many moderate threat land uses or activities in the IWPA, as seen in Table 2. Please note that the area within the IWPA that is designated as "Cropland" is actually an organic, children's garden. No pesticides or commercial fertilizers are used.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Confirmed hazardous materials/oil release sites (2)	No	Well #1	**	RTN 1-0013146, Tier 1C sites (RAO submitted); See Appendix A
Fuel Storage - Aboveground	Well #1	Both wells	Moderate	Oil tanks should have 110% containment
Sump pumps in boiler room	Well #1	Both wells	Moderate	Protect sumps from potential release or close out the sumps. Refer to UIC program.
Septic System	No	Both wells	Moderate	See septic systems brochure in the appendix
Electrical Transformers	Well #1	Both wells	Moderate	Request information regarding PCB in MODF change from your electric company
Parking lot, driveways & private access roads	Well #1	Both wells	Moderate	Limit road salt usage and maintain drainage away from wells

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/). \*\* - See Appendix A.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Nonconforming Activities in Zone Is** – Currently, the wells do not meet DEP's restrictions, which allow only water supply related activities in the Zone I. Well #1's Zone I contains several buildings, driveways, fuel oil storage and waste transfer/recycling stations. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ If land uses within the Zone I cannot be managed to mitigate potential threats to the well, or water quality is impacted by existing activities, consider installing a well in a more remote area.
- ✓ Do not use or store pesticides, fertilizers, petroleum products (including equipment that use petroleum) or deicing material within the Zone I.

**2. Confirmed Oil Release Site** - The IWPA contains a DEP Bureau of Waste Site Cleanup, Tier 1C Classified Oil and/or Hazardous Material Release site indicated on the map as Release Tracking Number 1-0013146. There had been two releases that were link together and addressed simultaneously. The first release of oil was discovered after the filling of ASTs in October 1999 and the second was in 2000. Contaminated soil was removed from the sites, and an RAO statement was submitted in August 2000. A screening of the RAO by the BWSC Audits/Site Management group did not find any deficiencies in the RAO. For further information on the site, please contact the DEP-Bureau of Waste Site Cleanup at 413-784-1100. For information regarding the location of the site refer to the attached map. Refer to Appendix A for information regarding the Massachusetts Contingency Plan (MCP) and where additional information is available.

### Recommendation:

- ✓ Comply with the requirements of the MCP process and continue monitoring as prescribed by DEP.

**3. Aboveground Storage Tank (AST)** – There are several ASTs containing heating oil and propane located within the Zone I and throughout the IWPA. All of the underground fuel oil tanks have recently been replaced with these new ASTs. All of the ASTs at Gould Farm have some containment, although it may not be 110% of tank capacity. Aboveground Storage Tanks may still be a potential source of contamination due to leaks, spills or overfills of the chemicals they store and must be monitored and maintained.

### Recommendations:

- ✓ Monitor all deliveries and ensure lines are sleeved and maintained.
- ✓ Increase as is practical, all oil/hazardous material storage containment and maintain safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

**4. Floor drain sump pumps in boiler rooms** - Floor drains are often installed in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, preventive measures must be taken. In this case, sump pumps present in the basement may be subject to contamination from boilers within the vicinity. Sump pumps in an area that contains hazardous materials must be sealed, discharged to a sewer or a tight tank. Most sump pumps drain to the septic waste lagoons nearby.

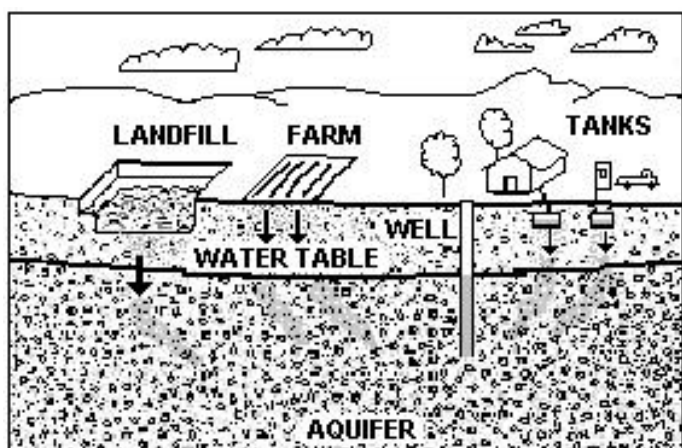


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

### Recommendations:

- ✓ Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
  - Interim Actions: cease using the floor drains.
- ✓ Protect the sumps from contaminants. Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Install containment around the boiler to protect the sump from contaminants. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ If protection measures cannot guarantee that boiler blow down or oil will not enter the floor drain, seal the floor drain or install a tight tank and connect the sump pumps that may be impacted by boilers to the tank.

Other activities noted within the protection areas or in the immediate vicinity are several individual septic systems serving Gould Farm buildings, electrical transformers and farming activities. The sanitary waste from the main facilities discharges to wastewater treatment lagoons located just outside the IWPA. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. Refer to the attachments for more information regarding septic systems. Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some older transformers. Contact the local utility to determine if the transformers contain PCBs. Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm. Refer to attachments for agriculture BMPs.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Gould Farm is commended for removing all Underground Fuel Oil Storage Tanks. Gould Farm should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Provide proper containment for all ASTs.
- ✓ Seal or otherwise address floor drains in boiler room areas.

### Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs in areas such as along the parking lots and roadway.

- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism. Monitor fuel delivery and check above ground tanks for leaks, etc.
- ✓ If Gould Farm intends to continue utilizing the structures in the Zone I, use BMPs and restrict and control activities that could pose a threat to the water supply.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store petroleum products, pesticides, fertilizers or deicing materials within the Zone I. Use secondary containment for these products stored in the IWPA.
- ✓ Upgrade to propane or natural gas for back-up power sources.

### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices;



include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.

- ✓ Post drinking water protection area signs at key visibility locations away from the wellhead.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials.
- ✓ Eliminate any non-sanitary wastewater discharges to on-site septic systems.
- ✓ Bring the floor drains into compliance with DEP Regulations (refer to attachment “Industrial Floor Drain Brochure”).
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) and an Integrated Pest Management Program for the use of fertilizer and pesticides on facility property.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document “A Summary of Requirements for Small Quantity Generators of Hazardous Waste” to determine your status and regulatory requirements.

### **Planning:**

- ✓ Work with local officials in Monterey to include Gould Farm’s IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Agriculture:**

- ✓ Follow all applicable UMASS recommendations on Integrated Pest Management.
- ✓ Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
- ✓ Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.

### **Funding:**

The Department’s Source Water and Wellhead Protection Grant Programs provide funds to assist public water suppliers in addressing protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response (RFR), application request, for the Grant program on or about May 1. The applications are due back to the Department on or about June 30. Other funding opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glpgrgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure

## **5. Appendix**

Table of DEP Regulated Chapter 21E Hazardous Materials Release Sites

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
DEM BEARTOWN STATE FOREST



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	DEM Beartown State Forest
<i>PWS Address</i>	Blue Hill Rd.
<i>City/Town</i>	Monterey, Massachusetts
<i>PWS ID Number</i>	1193015

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Head Quarters	1193015-01G	100	401	High	High
Benedict Pond	1193015-02G	100	407	High	High
Swan Lodge	1193015-03G	100	401	High	High

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

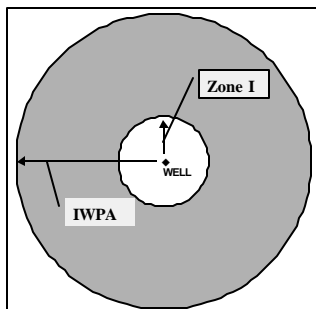
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for  
HEADQUARTERS WELL  
(1193015-01G)**

Zone I = 100 ft.  
IWPA = 401 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I / IWPAs. The **high** susceptibility to potential non-microbial threats is based on storage of hazardous materials such as heating oil within the Zone I and/or the IWPAs. Other moderate threats include the local roads and parking areas within the Zone I and/or the IWPAs.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, Sanitary Survey, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information you submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For THE SEVEN STONES



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	The Seven Stones
<b>PWS Address</b>	103 Lake Buel Rd
<b>City/Town</b>	Monterey, Massachusetts
<b>PWS ID Number</b>	1193019

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1193019-01G	250	621	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

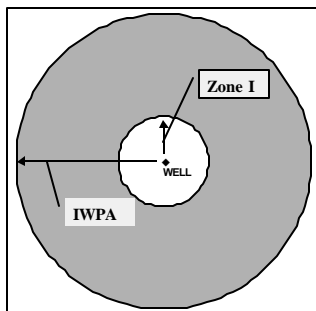
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1193019-01G)**

Zone I = 250 ft.  
IWPA = 621 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the access roads and parking within the Zone I and the IWPA. Well #2 is designated as an emergency source used only for filling the pool and is not addressed in this report.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dwr/bm/dwr>

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
LSGPO ASSOCIATION



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	LSPGO Association
<b>PWS Address</b>	70 Tyringham Rd
<b>City/Town</b>	Monterey, Massachusetts
<b>PWS ID Number</b>	1193023

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1193023-01G	182	478	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

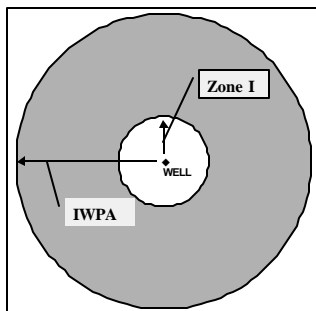
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The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1193023-01G)**

Zone I = 182 ft.  
IWPA = 478 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and the barn within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Mountain View Health Care Center

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
November 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Mountain View Health Care Center</b>
<i>PWS Address</i>	<b>Montgomery Road</b>
<i>City/Town</i>	<b>Montgomery, Massachusetts</b>
<i>PWS ID Number</i>	<b>1194001</b>
<i>Local Contact</i>	<b>Mr. John Sullivan</b>
<i>Phone Number</i>	<b>1-413-238-5344</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1194001-02G	263	672	Moderate
Well #3	1194001-03G	273	720	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Montgomery is a small, rural community in the Berkshire foothills of western Massachusetts. The Mountain View Health Care Center, nursing home, is located on Montgomery Road and serves a population of approximately 35 to 40 residents and staff. Montgomery does not have a municipal water system or a municipal wastewater treatment facility. Therefore, the nursing home utilizes two, on-site water supply wells

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

and wastewater is discharged through an on-site septic system. Well #2 is a 6-inch diameter, 500-foot deep, bedrock well and has a reported historical yield of 8.5 gpm. The well is located 75 feet west of the building. Well #3 is a 6-inch diameter, 400-foot deep, bedrock well and has a reported historical yield of 10 gpm. Well #3 is located 150 feet northwest of the building. The nursing home also maintains one emergency supply well (01G) which is located in the front of the building, was severed from the system and is not used due to chronic bacteria contamination in the past. Emergency sources will not be addressed further in this report.

The Zone I is the protection area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #2, based on a historical pumping rate of 8.5 gpm, are 263 feet and 672 feet, respectively. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #3, based on a historical pumping rate of 10 gpm, are 273 feet and 720 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Both wells withdraw water from the bedrock aquifer. The complex is located on an upland area underlain by till and shallow bedrock. Geologic maps of the area identify the bedrock as schist of the Goshen Formation. There is no evidence of a continuous confining unit in the immediate area. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The water does not receive treatment but it is disinfected with chlorine prior to distribution due to the wells' proximity to the septic systems. For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The Zone Is for the wells are not in compliance with the DEP Zone I requirements that

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Transportation corridor/parking	Well #2	Both	Moderate	Limit road deicing materials usage and monitor parking areas.
Nursing home	Well #2	Both	Moderate	Supply BMPs to staff regarding waste disposal.
Fuel storage/Floor drain	Well #2	Both	Moderate	Continue to use best management practices and monitor use and delivery of petroleum products.
Septic system components	Both	Both	Moderate	Continue to maintain septic system and protect it from improper disposal.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

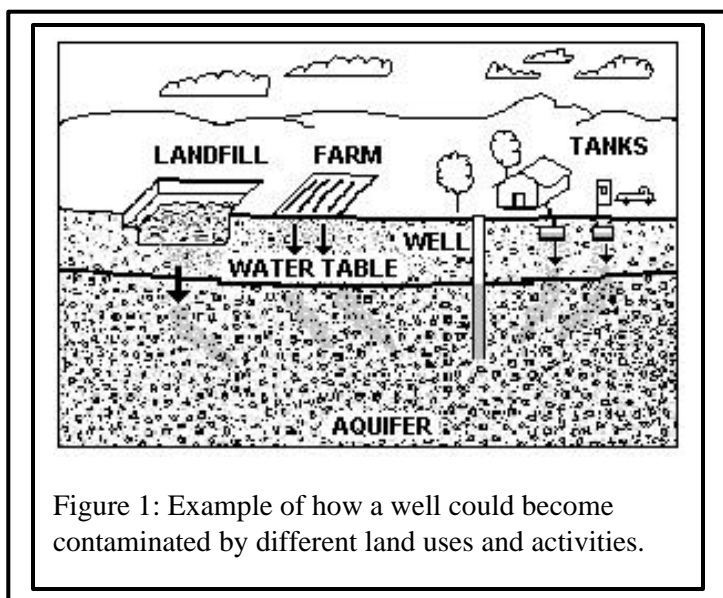


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

restrict activities to only those associated with water supply or passive, non-threatening activities. The Zone Is and IWPA's encompass the entire complex including the residential area, the fuel oil storage area (inside the building), and septic system components. The facility chlorinates the water prior to distribution.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Transportation/parking**
3. **Nursing Home/residential septic systems,**
4. **Fuel storage (ASTs), and**
5. **Floor drain in boiler room.**

The overall ranking of susceptibility to contamination for the Nursing Home supply wells is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1. Continued monitoring and site management is recommended to prevent accidents and minimize threats within the Zone I and IWPA protection areas of the wells.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area and there are non-conforming activities within the Zone Is. Systems not meeting DEP Zone I requirements for ownership or control, or that have non-conforming activities within Zone I, must receive DEP approval and address Zone I issues prior to conducting work in Zone I, increasing water use or modifying systems.

### Zone I Recommendations:

- V Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- V Monitor all fuel oil deliveries and parking areas.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.
- V Maintain septic systems and upgrade as appropriate.
- V Replace the wells with a conforming source if activities cannot be mitigated or water quality is impacted by activities in the Zone I.

**2. Transportation corridor/parking** – Montgomery Road and the facility parking areas are located within the Zone I and IWPA.

### Transportation corridor Recommendations:

- V Monitor all parking areas and continue to ensure the drainage flows away from the wells.
- V Prepare an Emergency Response Plan that includes coordination among the DEP, the Town, and the State Police in the event of an accident near the wellhead.

**3. Nursing Home/Residential Land Use** – The nursing home and two residences are located within the Zone Is and IWPA's. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include cleaning materials, medications, automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used generally in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

### Residential Land Use Recommendations:

- V Educate staff, particularly maintenance staff on best management practices (BMPs) for protecting water supplies. Focus efforts on management and disposal of cleaning materials and potentially hazardous materials.

**4. Aboveground fuel oil storage** - There are two fuel oil ASTs located within the building within the Zone I of both wells. Both tanks are within containment structures. If managed improperly, fuel oil tanks and their associated fuel lines can be a potential source of contamination due to leaks or spills of the materials they store.

#### Recommendation:

- V Any modifications to the tanks and the lines must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- V Monitor all activities associated with the fuel oil especially delivery.
- V Have spill containment/absorbent materials available on-site.
- V Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room.

**5. Floor Drain in Boiler Room** - There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

#### Recommendations:

- V Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- V Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require your boiler maintenance contractor use



containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- ✓ Determine the discharge location of the drains. Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

## **4. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Please review and adopt the key recommendations above and as follows:

### **Priority Recommendations:**

- ✓ Maintain the septic systems and consider options for replacement of system or wells as is appropriate.

### **Zone I:**

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

### **Planning:**

- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding Sources:**

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
CARRIAGE HOUSE MOTEL



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	Carriage House Motel
<b>PWS Address</b>	Route 7
<b>City/Town</b>	New Ashford, Massachusetts
<b>PWS ID Number</b>	1200002

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well # 1	1200002-01G	209	519	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

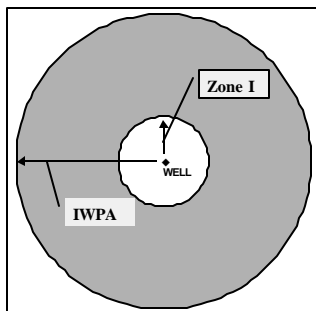
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1200002-01G)**

Zone I = 209 ft.  
IWPA = 519 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials in the basement of the motel in the Zone I and other moderate threat activities are local roads and parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, a Sanitary Survey, water quality data, and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Mill River Water Takers

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public **water** supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 7, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Mill River Water Takers
<b>PWS Address</b>	Southfield Road
<b>City/Town</b>	New Marlborough, Massachusetts
<b>PWS ID Number</b>	1203000
<b>Local Contact</b>	Alfred Lenardson
<b>Phone Number</b>	(413) 229-8654

### Zone II GIS ID# 599

<b>Spring Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>Source Susceptibility</b>
Spring (01G)	1203000-01G	376	Moderate
Spring (02G)	1203000-02G	376	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Mill River Water Takers is a small community water system located within the village of Mill River in the town of New Marlborough, in southern Berkshire County. The source for Mill River Water Takers is located northeast of Southfield Road near the intersection with Church Road. The system's water is supplied by two spring collection boxes (01G and 02G) that act as a single source; source 01G flows by gravity into 02G. The two spring sources have square Zone I protection areas measuring 376 feet by 376

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

feet on a side based on a total system flow estimated by the USGS. The Zone II for the spring system was delineated by the USGS as part of the SWAP program. Preliminary reports from the USGS indicate the source of the spring water is primarily sand and gravel with some contribution from bedrock. The springs are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and Zone II.

The springs have no treatment at this time but the water is chlorinated prior to distribution. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available at the website [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html). Envirofacts.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Roads; and,**
3. **Sand and Gravel Mining (inactive).**

The overall ranking of susceptibility to contamination for the springs is moderate, based on the presence of at least one moderate threat land use or activity in the Zone I and/or Zone II, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the spring system does not meet DEP's restrictions, which only allow water supply related activities or non-threatening activities in Zone I. The facility's Zone I contains local roads. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. There is a drop inlet and stormwater collection system upgradient of the spring on Mill River Road and the water supplier has installed a curtain drain around the spring box to collect shallow surface water runoff and direct it away from the collection box.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP before expanding or modifying the system.
Transportation corridors	Yes	Yes	Moderate	Continue working with the community to manage stormwater and limit road salt usage.
Sand and Gravel Mining (inactive)	No	Yes	Moderate	Continue communication with the property owner regarding future land use. Heavy equipment, fuel storage, clandestine dumping, spills or leaks are associated with active mines.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Continue the current practice of monitoring activities and working with the DPW to manage road and surface water drainage in the Zone I by directing runoff away from the springs. Encourage the DPW to continue to maintain the stormwater system upgradient of the spring.
- ✓ Continue to work with the DPW and assess stormwater runoff along Mill River Road.
- ✓ Maintain the stormwater collection drains on the site of the spring.

**2. Transportation corridors** - Roads are potential sources of contamination due to deicing of roadways and leaks or spills of fuels and other hazardous materials during accidents.

## Recommendation:

- ✓ Contact the local fire department to ensure that the Zone I and Zone II areas are included in Emergency Response Planning.
- ✓ Continue the current practice of monitoring activities and working with the DPW to manage road and surface water drainage in the Zone I by directing runoff away from the springs. Encourage the DPW to continue to maintain the stormwater system upgradient of the spring and refer to recommendations for Zone I.

**3. Sand and Gravel Mining** – A formerly active sand and gravel mining operation is located within the Zone II. Sand and gravel mining is a potential source of contamination due to the possibility of spills or leaks from heavy equipment, fuel storage, and clandestine dumping. Although small quantities of fill are removed from the site, the facility is presently not operating commercially.

## Recommendations:

- ✓ Consider negotiating the purchase or entering into an agreement to protect the property in the future.
- ✓ Continue communicating with the landowners regarding proposed future land use.
- ✓ Encourage Best Management Practices for storage, use, and disposal of hazardous materials such as fuel if the facility becomes active in the future.
- ✓ Inspect the Zone II for signs of clandestine dumping on a regular basis.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the spring's susceptibility to contamination. Mill River Water Takers is commended for sealing a floor drain in the pump house and installing a curtain drain and road drainage to direct stormwater runoff away from the springs. Mill River Water Takers should review and adopt the key recommendations above and the following:

## Facilities Management:

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

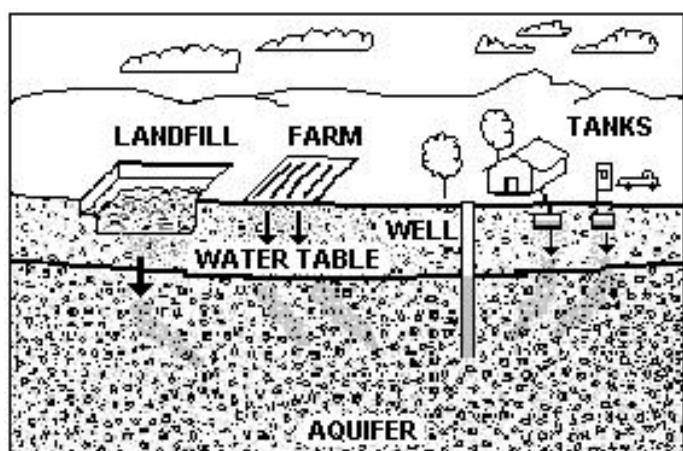


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### Planning:

- ✓ Work with your community to ensure that stormwater runoff is directed away from the springs and is treated according to DEP guidance.
- ✓ Work with local officials in town to include the facility Zone II in Aquifer Protection District bylaws if the town adopts such bylaws in the future.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Consider long term planning for the system that includes maintenance of the system.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet





# Massachusetts Department of Environmental Protection

## Source Water Assessment and Protection (SWAP) Report

### for

## Southfield Water Trust

#### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 24, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Southfield Water Trust
<i>PWS Address</i>	Norfolk Road - Southfield
<i>City/Town</i>	New Marlborough, Massachusetts
<i>PWS ID Number</i>	1203002
<i>Local Contact</i>	Mr. John Stevens
<i>Phone Number</i>	(413) 229-2726

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #2	1203002-01G	226	554	High

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

The Southfield Water Trust is a small community water system located in Southfield, a village in the town of New Marlborough, southern Berkshire County. The system serves 33 residences, two municipal buildings and a commercial facility. The system's water is supplied by a single 6-inch diameter bedrock well that is located approximately 500 feet east of Norfolk Road behind the former whip shop and a residence. New Marlborough does not have a municipal sewer system and therefore, all wastewater is discharged to on-site septic systems.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 226 feet and 554 feet, respectively, based on metered water use from the system.

The overburden in the area is comprised of glacially derived till of varying thickness over the bedrock; limited stratified drift and alluvium are deposited along river and stream valleys. However, in the vicinity of the well, the surficial geology is mapped as till. The bedrock in the area is mapped as the metamorphic rocks of the Berkshire Highlands, primarily granite, biotite gneiss. Although there is some evidence of a protective barrier of till, the confining unit is highly variable and there is no evidence of a significant and continuous protective barrier in the immediate vicinity of the well. Therefore, the Department has determined this well to have a high vulnerability to contamination due to the absence of a continuous hydrogeologic barrier throughout the recharge area that can prevent contaminant migration from land uses on the ground surface. Please refer to the attached map of the Zone I and IWPA.

Water from the well is not treated at this time prior to distribution. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available at the website [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html). Envirofacts.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Non-conforming Zone I;**
2. **Residential uses;**
3. **Transportation corridors;**
4. **Confirmed hazardous materials release sites;**
5. **Underground Storage Tanks (USTs); and**
6. **Hazardous materials storage.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Confirmed hazardous materials release sites	No	Yes	-	Contact DEP Bureau of Waste Site Cleanup for additional information.
Residential uses (high density)	Yes	Yes	Moderate	Use BMPs for household hazardous waste, heating fuel, septic system management, and lawn care and stormwater runoff.
Hazardous materials	Yes	Yes	High	Conduct inspections of facilities, encourage the use of BMPs and regulatory compliance. Coordination with emergency responders.
Transportation corridors	Yes	Yes	Moderate	Limit road salt usage and provide drainage downgradient from the well.
USTs/ASTs	No	Yes	High	Remove USTs or upgrade older tanks as is feasible. Monitor all deliveries.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the source is high, based on the presence of at least one high threatening land use or activity in the Zone I and/or IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities or non-threatening activities in Zone I. The facility's Zone I contains residential activities. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. The ground immediately around the well casing has in the past been subject to slumping that would allow ponding of water around the casing. The Water Trust has corrected this problem but should be diligent in monitoring the area and maintaining adequate drainage.

### Recommendations:

- ✓ Continue the current practice of monitoring activities in the Zone I and prohibiting, as is feasible, the use of pesticide, fertilizers and household hazardous materials.
- ✓ Continue to regularly physically inspect the casing and drainage around the well.

**2. Residential Land Uses** – The IWPA for Well #1 has high-density residential land and commercial use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

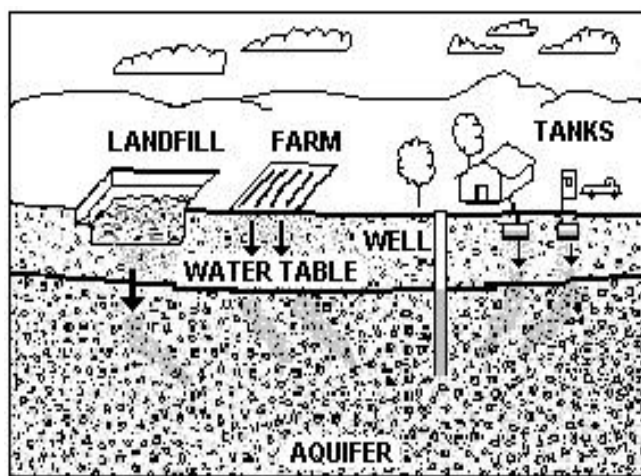


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridors** - Roads are potential sources of contamination due to deicing of roadways and leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact the local fire department to ensure that the Zone I and IWPA areas are included in Emergency Response Planning.

**4. Underground and Aboveground Storage Tanks (UST/AST)** – There are several USTs located within the IWPA and within close proximity to the IWPA of the well. Although in recent years some tanks have been removed or replaced, there are still both fuel oil and gasoline tanks. It is assumed that numerous homes have ASTs.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### Recommendations:

- ✓ USTs and ASTs in close proximity to the water supply should be closely monitored, especially during deliveries. Review stormwater flow direction and anticipate control of a potential spill during delivery.
- ✓ Work with the fire department to encourage removal and upgrade of tanks and fuel lines as appropriate.
- ✓ Continue to evaluate and consider a replacement well location, as is feasible.
- ✓ Any upgrades and modification to fuel storage facilities must meet current construction standards and be done consistent with Massachusetts plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**5. Confirmed Hazardous Materials Release Site** – There are confirmed hazardous materials release sites in the vicinity of the wellhead protection areas. Refer to Appendix C to review the site and refer all questions to the DEP Bureau of Waste Site Cleanup.

### Recommendations:

- ✓ Monitor activities at these sites. Contact the Bureau of Waste Site Cleanup at 413-784-1100.

**6. Hazardous Materials Storage and Use** – Although there are no registered generators of hazardous waste, facilities within the IWPA such as the fire station and commercial facilities may store small quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a floor drain leading directly to the ground or be discharged directly to the ground. Please refer to the Attachment for a list of registered USTs. Vehicle washing is an activity that should be monitored and there are guidelines for facilities that wash vehicles.

### Hazardous Materials Storage and Use Recommendations:

- ✓ Aboveground storage tanks for hazardous products should be located on an impermeable surface and within containment in an area large enough to hold 110% of the liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices including overfill protection. Any modifications to ASTs must be accomplished in a manner consistent with Massachusetts plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Review the vehicle washing guidance as appropriate.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The Southfield Water Trust is commended for its detailed knowledge of the land uses within the IWPA and efforts to protect the source. The water supplier should review and adopt the key recommendations above and the following:

### Facilities Management:

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Inspect the well casing and the integrity of the storage facilities regularly.

**Planning:**

- V Work with your community to ensure further awareness and protection of the water supply.
- V Work with local officials in town to develop Aquifer Protection District(s) and bylaws and include the facility IWPA in Aquifer Protection District bylaws if the town adopts such bylaws in the future.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Consider long term planning for the system that includes maintenance of the system.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. The Department posts a new Request for Response for the Grant program (RFR) for each program year, if funds are available. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- List of underground storage tanks and confirm hazardous materials release sites

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### Underground Storage Tanks in are adjacent to protection areas

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Southfield Store	Southfield - Norfolk Road	New Marlborough	Gasoline Dispenser	2 Wall	Interstitial Monitoring	1,000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site:

<http://www.state.ma.us/dfs/ust/ustHome.htm>

Additional information provided by individual owners.

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0010911	Southfield – Norfolk Road	New Marlborough	Oil
1-0000777	Southfield – Norfolk Road	New Marlborough	

For more location information, please see the attached map. The map lists the release sites by RTN.



# Massachusetts Department of Environmental Protection Source Water Assessment Program (SWAP) Report for Kolburne School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Kolburne School</b>
<i>PWS Address</i>	<b>Southfield Road</b>
<i>City/Town</i>	<b>New Marlborough, Massachusetts</b>
<i>PWS ID Number</i>	<b>1203003</b>
<i>Local Contact</i>	<b>Mr. William Enser</b>
<i>Phone Number</i>	<b>413-243-1416</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone 1 (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
B urritt Well	1203003-01G	238	585	Moderate
Intake Well	1203003-02G	160	456	High
Main Administration Well	1203003-03G	104	424	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. School officials, citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your school.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Kolburne School is a year round residential school located in the community of New Marlborough, for children age 8 through 14 with behavior difficulties and learning disabilities. New Marlborough is a small rural community in southern Berkshire County along the Connecticut border. The facility population is approximately 130 staff and students. New Marlborough does not have municipal water or wastewater disposal, therefore the facility is served by on-site water supply and on-site septic disposal. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

school maintains three active, independent bedrock well sources that serve different parts of the systems: Burrirt Hall well (1203003-01G); Intake Office well (1203003-02G); and Main Office well (1203003-03G). Burrirt Hall well is a 6-inch diameter, 260 feet deep bedrock well that is located in a pit, behind the dorm and serves two dorms, a dining room and classroom building. The Intake Office well is a 6-inch diameter, 69 feet deep bedrock well that is located in a pit, behind Stanley Hall and serves six buildings. The Main Administration Office well is a 6-inch diameter, 205 feet deep bedrock well that is in a manhole located in a field behind the maintenance facility; the well serves the main office, the maintenance facility and the director's residence, Pine Edge. The wells and distribution systems are not interconnected.

The Zone I for a well is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPA for the Burrirt Hall well are 238 feet and 585 feet, respectively; the Zone I and IWPA radii for Intake Well are 160 feet and 456 feet, respectively; and the Zone I and IWPA radii for Main Administration Well are 160 feet and 456 feet, respectively. The protective radii are based on metered water use from the wells.

The school is located in the Massachusetts Berkshire highlands; the bedrock is mapped as the gneiss of the Taconic-Berkshire Zone, an area of highly complex folds and faults. The overburden is a relatively thin layer of till (ground moraine) with bedrock commonly exposed. There is no record of a confining, protective clay layer or thick till in the vicinity of the wells. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential School	01G & 02G	01G & 02G	Moderate	Use BMPs for all activities near the wells.
Transformers	All	All	Low	MODF (oil) – potential leaks. Confirm that all transformers use non-PCB MODF.
Maintenance facilities/mini-bike shop	03G/02G	03G	High	Use BMPs for handling, storage and use of hazardous materials.
Parking lots, internal transportation corridors	02G	All	Moderate	Request limited use of road salt and provide drainage away from well.
Septic system components	01G & 02G	All	Moderate	Use BMPs to maintain systems and prohibit disposal of non-sanitary waste to systems. School utilizes a dry well for gray water at one dorm.
UST/AST	01G & 02G	All	High/Moderate	Continue to upgrade and maintain storage tanks as appropriate and monitor all use and deliveries
Hazardous materials use and storage (VSQG)	All	--	Moderate	Household hazardous materials and VSQG

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

Water from the wells serving the facility is not treated at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone Is and IWPA's and Table 1 for additional information regarding the location of the wells and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are several activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Institutional use - residential school,**
3. **Underground and above ground storage tanks**
4. **Transportation corridors,**
5. **Hazardous materials management.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of one or more high ranking land uses or activities in the Zone I and IWPA of at least one of the sources, as seen in Table 2.

**1. Non-conforming Zone I**– The Burritt and Intake wells are non-conforming to current DEP regulation that limits activities within Zone I to water supply related or other non-threatening activities. The Zone I for the Main Administration Well 03G, is conforming, however the maintenance garage is on the edge of the Zone I. Many sources were developed prior to DEP Zone I restrictions and are grandfathered sources. DEP approval is required prior to increasing water use or modifying systems for sources that are not in conformance with Zone I requirements.

### Recommendations:

- V Continue to monitor activities within the Zone I and prohibit any new non-water supply activities in Zone I.
- V Use Best Management Practices for handling all household hazardous materials, stormwater runoff, and septic system maintenance.
- V Consider relocation of wells if potential threats cannot be mitigated and water quality is impacted.

**2. Institutional use – Residential school** - The facility is a residential school with all associated activities including dormitories, infirmary, recreational facilities, classrooms, maintenance facilities, parking, etc. Maintenance and services provided to the facility include all household hazardous materials including petroleum products for maintenance vehicles (lawn mowers, tractors, etc) paints and cleaning materials.

### Recommendations:

- V Use BMPs for activities within close proximity to the wells.
- V Continue monitoring and managing stormwater runoff, directing it away from the wellhead.
- V Do not use pesticides or fertilizers within the Zone I of the wells. Utilize Integrated Pest Management (as practical) on campus to minimize the use of pesticides and nutrients in fertilizers.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

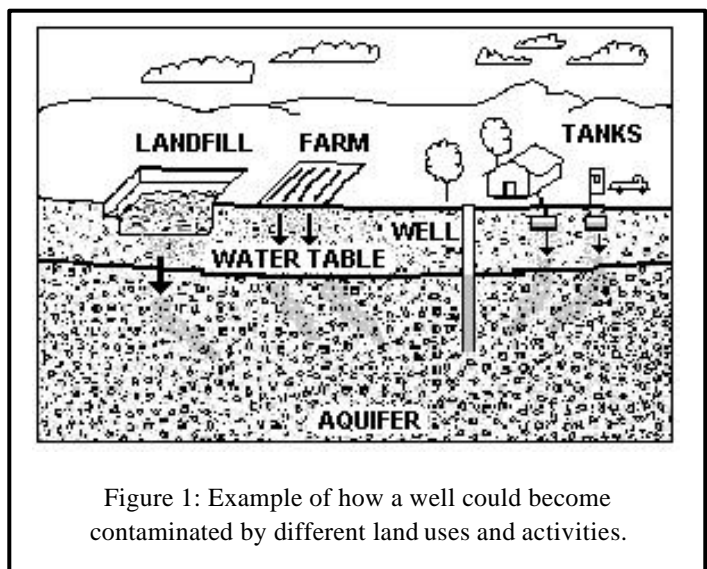


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (I WPA).

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and local town boards.

**3. Underground and above ground storage tank (UST/AST)** – The school has two 500-gallon USTs with fuel oil and several ASTs with gasoline and fuel oil. If managed improperly, USTs and ASTs and their associated fuel lines can be a potential source of contamination due to leaks or spills of the chemicals they store.

#### Recommendation:

- ✓ Any modifications to the USTs and ASTs must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding storage tanks. Monitor all activities associated with the products especially during delivery.

**4. Transportation corridors** – There are internal walkways/access roads within the Zone Is and/or IWPA's of the wells. Roadway construction, maintenance, and typical use, even on low use roads can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals such as fuel oil. De-icing materials, automotive chemicals and other debris on roads and in parking areas, are picked up by stormwater and wash into catchbasins or to swales. Stormwater management issues on town roads should be addressed in cooperation with the Town.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Use minimal road deicers within the protective areas, and monitor the parking lot and roadside for spills and leaks.

**5. Hazardous Materials Storage and Use** – The school has small amounts of hazardous materials associated with maintenance at the school. The facility is registered as a Very Small Quantity Generator of hazardous waste and maintains a locked storage facility near the Main Office. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to discharge into a floor drain leading to the ground or directly to the ground. This includes floor drains in boiler rooms. The facility uses propane as a fuel source. However, floor drains in areas that hazardous materials make be discharged to, including boiler rooms, may not discharge to the septic system and should be connected to a tight tank. Contact the DEP Underground Injection Control Program (Rick Larson at 413-755-2207) if you require additional information.

#### Hazardous Materials Storage and Use Recommendations:

- ✓ Educate staff on best management practices for storage, use and handling of hazardous materials for protecting water supplies.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Kolburne School is commended for improving management of hazardous materials and is encouraged to continue reviewing and evaluating storage, use and disposal of hazardous materials on campus. Continue monitoring activities in the protection areas and review and adopt the key recommendations above and as follows:

#### Priority Recommendations:

- ✓ Review activities and practices at the maintenance facility. Continue use of BMPs for use and handling of hazardous materials.
- ✓ Maintain septic systems and prohibit inappropriate disposal into the systems.

**Zone I:**

- ✓ Prohibit any new non-water supply activities from the Zone Is.
- ✓ Conduct regular inspections of the Zone Is. Look for evidence of leaks or spills and regularly inspect the integrity of the well caps and seals around the wells.
- ✓ Do not use or store pesticides, fertilizers or hazardous materials within the Zone I.

**Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices, including custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs away from the immediate area of the wells and at locations where BMPs should be used.

**Facilities Management:**

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property. Do not use pesticide in Zone I. Incorporate an Integrated Pest Management (IPM) approach into your pest management programs. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Ensure that stormwater runoff is directed away from the water supplies.

**Planning:**

- ✓ Request that the town develop a Wellhead Protection District and associated bylaws and request that the IWPA for your and other water systems be include in the protection area.
- ✓ Work with local officials in New Marlborough to include the School Zone Is and the IWPA's in their emergency planning and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- ❖ Map of the Public Water Supply (PWS) Protection Areas
- ❖ Recommended Source Protection Measures Fact Sheet



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
YMCA CAMP WA WA SEGOWEAU



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	YMCA Camp Wa Wa Segoweau
<i>PWS Address</i>	Foley Hill Rd
<i>City/Town</i>	New Marlborough, Massachusetts
<i>PWS ID Number</i>	1203009

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1203009-01G	182	478	High	Moderate
Well #2	1203009-02G	182	478	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

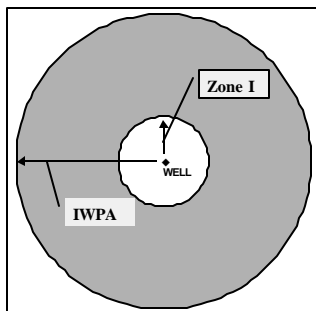
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1203009-01G)**

Zone I = 182 ft.  
IWPA = 478 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and/or the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, a Sanitary Survey, water quality data, and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for New Marlborough Central School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	New Marlborough Central School
<i>PWS Address</i>	44 Harstville - Hill Road
<i>City/Town</i>	New Marlborough, Massachusetts
<i>PWS ID Number</i>	1203011
<i>Local Contact</i>	Mr. William Cooper, Superintendent
<i>Phone Number</i>	413-229-8778

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1203011-01G	100	421	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

New Marlborough Central School, an elementary school with a total staff and student population of approximately 100 people, is located immediately on the side of the road in a rural, residential setting. Well 1 is the sole source of water for the school and is on the northeast side of the school, within 5 feet of the school wall. The Zone I protective radius for Well 1 is 100 feet and the Interim Wellhead Protection Area (IWPA) radius is 420 feet. The protective radii were based on the average daily water use of 950 gallons per day (gpd) calculated from metered data for the maximum reported month. Please refer to the attached map that shows the Zone I and IWPA.

Well 1 is a 6inch diameter well with the pump set at approximately 180 feet and is reportedly drilled to a final depth of 425 feet. There is no record of final construction of the well or of the materials encountered during drilling. Geologic mapping of the area

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

indicates the overburden material at the school consists of sand and gravel, stream terrace deposits but does not indicate the depth of the deposits. Because of the depth of the well, it is assumed to be a bedrock well. The bedrock is mapped as carbonate (limestone and dolomite) rocks of the Stockbridge Group. Bedrock wells drilled in these conditions are considered to be highly vulnerable to potential contamination from the ground surface because there is no significant barrier to prevent surface contamination from migrating into the bedrock aquifer.

### Water Quality

The New Marlborough Central School well water does not require and does not have treatment at this time. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Activities in Zone I**
2. **An Underground Fuel Oil Storage Tank in IWPA**
3. **Parking, roadways and storm water catch basins**
4. **Floor Drain**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high and several moderately ranked land use or activities in the IWPA, as seen in Table 2.

1. **Non-conforming Activities in Zone I** – Currently, the well does not meet DEP's restrictions that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, roads, parking areas, and septic system components. The public water supplier does not own all land encompassed by the Zone I and therefore has no control over some of the activities. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground (UST)	No	Yes	High	Underground heating oil tank
Parking lot, storm drains, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells. Maintain drains.
Athletic Field	No	Yes	Moderate	Continue policy of no fertilizer or pesticide usage. Passive recreation.
Septic System	No	Yes	Moderate	See septic systems brochure in the attachments
Low density residential w/septic systems	No	Yes	Moderate	See septic system/pesticide brochures in the attachments
Floor drain – Boiler Room and Gymnasium	Yes	No	Moderate	No hazardous materials stored in either room No additives to boiler.
Structures	Yes	Yes	-	Non-water supply activities in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well.

2. **Underground Fuel Oil Storage Tank (UST)** – The fuel oil storage tank was replaced in 1994 outside of the Zone I and was constructed in compliance with current requirements for double wall construction and leak detection. An UST in the IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel.

## Recommendations:

- ✓ Closely monitor activities associated with the fuel tank refilling and usage.
- ✓ Any further modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

3. **Parking, roadways and storm water catch basins** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

## Recommendations:

- ✓ Direct stormwater drain outflows away from the Zone I and IWPA.
- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

4. **Floor Drain** - The floor drain in the boiler room is required to protect the school from accidental plumbing failure. There are no hazardous materials stored in the boiler room and an outside contractor maintains the boiler. The janitor's room is adjacent to the boiler room. Although there are no hazardous materials stored there, the cleaning materials are kept in the room. Floor drains in the gymnasium and in

the stairwell immediately outside of the boiler room are believed to be connected to the same drain. It is the understanding of the school personnel that the drain leads to a surface outlet but collapsed some time ago.

## Recommendations:

- ✓ Install a shallow berm across the threshold between the janitor's room and the boiler room to prevent any accidental spills through the floor drain. Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the bermed boiler. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. Request that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

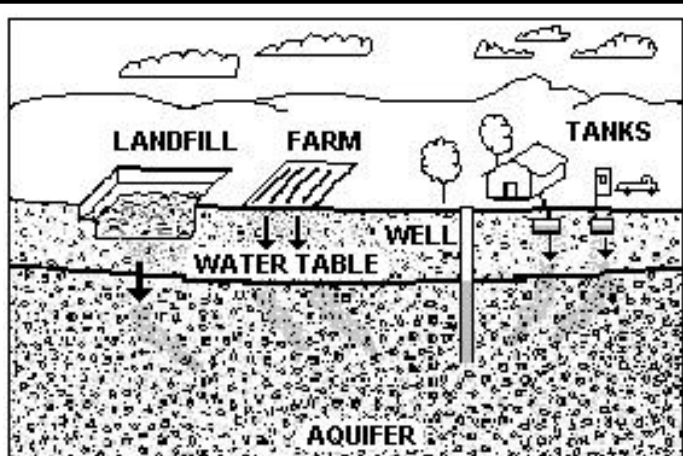


Figure 1: Example of how a well could become contaminated by different land uses and activities.



#### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The staffs of the Southern Berkshire Regional School District and the New Marlborough Central School are commended for current protection measures. The New Marlborough Central School in conjunction with the district and local officials should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Install a shallow berm between the janitor's room and the boiler room to prevent an accidental spill through the floor drain.

#### Zone I and IWPA:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Monitor all non-compliant activities in the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check area for accidental spills and leaks, etc.
- ✓ Maintain road and parking lot drainage and catch basins.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies or other references).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

#### Facilities Management:

- ✓ Prohibit non-sanitary wastewater discharges to on-site septic systems. Post sinks as appropriate.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems; install a berm between the janitor's room and the boiler room.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete wellhead protective pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers, including pole mounted transformers that may contain

PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Contact the utility if the area near the transformer has tree limbs that could endanger the transformer in a storm.

#### Planning:

- ✓ Work with local officials in New Marlborough to encourage the development of and implementation of Aquifer Protection Bylaws that would include the school's IWPA and to assist you in improving protection of your water supply. The Department can assist your community in developing wellhead protection bylaws.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.



- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers address Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Wellhead Protection Grant or the Source Water Protection Technical Assistance/Land Management Grant Program. For additional information, please refer to the attached program fact sheet. Please note that each program year, the Department posts a new Request for Response (RFR – grant application form) for the Grant programs on the internet on or about May 1. Responses are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**5. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Preparing a Wellhead Protection Plan
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Fertilizer Fact Sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
THE MANOR



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 27, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	The Manor
<i>PWS Address</i>	Rte 57
<i>City/Town</i>	New Marlborough, Massachusetts
<i>PWS ID Number</i>	1203012

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1203012-01G	240	592	Moderate	Moderate
Well #2	1203012-01G	240	592	Moderate	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

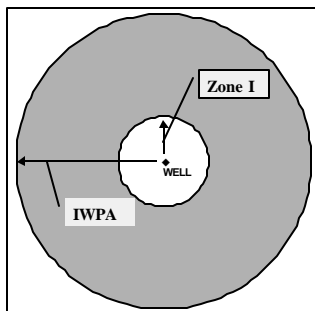
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for NEW  
WELL #1 (1203012-01G)**

Zone I = 240 ft.  
IWPA = 592 ft.



### How was my Well's Susceptibility Determined?

Your wells' **moderate** susceptibility to potential microbial threats is based on the construction of the wells and the potential for flooding around the casing. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Swift River Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Swift River Elementary School
<i>PWS Address</i>	201 Wendell Road
<i>City/Town</i>	New Salem, Massachusetts
<i>PWS ID Number</i>	1204001
<i>Local Contact</i>	Mr. Keith Fiske
<i>Phone Number</i>	978-544-6926

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in, feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1204001-01G	161	457	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

### The Well

Swift River Elementary School is a rural, elementary school located on the south side of Wendell Road in New Salem. The school student and staff population is approximately 200 people per day and is served by a single potable supply well (Well #1) located in the boiler room of the school.

The well has a Zone I protective radius of 161 feet and an Interim Wellhead Protection Area (IWPA) radius of 457 feet based on reported metered, maximum water usage. Although there is no record of well yield from the well installation, the pump has a rated

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

capacity of approximately 20 gpm. Well #1 is a 6-inch diameter well drilled to a depth of approximately 210 feet below ground. There is no known driller's log describing the construction of the well or materials encountered during drilling. However, it is known that the well pump is set at approximately 190 feet below ground. Bedrock outcrops are observed on-site indicating little or no overburden. The bedrock in the area is mapped as the Fourmile Gneiss, a layered massive, biotite-feldspar gneiss. Wells constructed in bedrock aquifers under these conditions are considered to have high vulnerability due to the lack of a barrier to prevent surface contaminants from migrating into the bedrock aquifer. Currently, the only treatment of the water is the addition of potassium carbonate to raise the pH preventing the leaching of copper and lead from the distribution pipes in the school. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, it was noted the few land uses and activities within the drinking water supply protection areas are potential sources of contamination.

### Key issues include:

1. **Non-conforming activities within Zone I**
2. **Septic System components in the IWPA**
3. **Floor drain in boiler room**

The well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the well is high, based on the presence of the presence of several moderate threat land use or activity in the IWPA, as seen in Table 2.

### 1. Non-conforming activities within Zone I

Currently, the well does not meet DEP's restrictions that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, roads, parking areas, and septic system components. The public water supplier does not own all land encompassed by the Zone I and therefore has no control over some of the activities. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Above Ground oil tank	Yes	No	Moderate	Secondary containment and line protection in place.
Septic System components (leachfield)	No	Yes	Moderate	Refer to attached septic system fact sheet.
Floor Drain in the boiler room to septic system	No	Yes	Moderate	Develop a policy and plan for protecting the floor drain during maintenance
Parking, storm water and road way	Yes	Yes	Moderate	Manage, monitor and maintain system.
Passive Recreation	No	Yes	Low	Athletic Fields

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

modifying systems.

### Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well.

2. **Septic systems** - The septic system leach field is located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems or discharge from the boiler room are also potential sources of contamination to the water supply.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator.
- ✓ Refer to the appendices for more information regarding septic systems. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine regulatory requirements.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

3. **Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. Floor drains in an area that contains hazardous materials must be discharged to a sewer or a tight tank. The boiler room at the Swift River Elementary School has a floor drain that discharges to the septic system. Oil lines from the tank to the boiler are sleeved and have a negative pressure so that so that any drop in pressure would cause the oil to drain back to the tank therefore minimal oil could leak to the boiler room in the event of an accident.

### Recommendations:

- ✓ A written policy and plan should be in place during maintenance operations, especially when oil filters are changed. Request that your boiler maintenance contractor use containment, protect the drain and have absorbent materials onhand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.

Other activities that were noted during the assessment were stormwater from the parking area and the road and some agricultural activities. As flowing storm water travels, it picks up debris and contaminants from parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, or accidents.

Pollutants are actually not removed from most catch basins until they are cleaned out. Regular maintenance is required to reduce the risk of resuspension of sediments and contaminants during

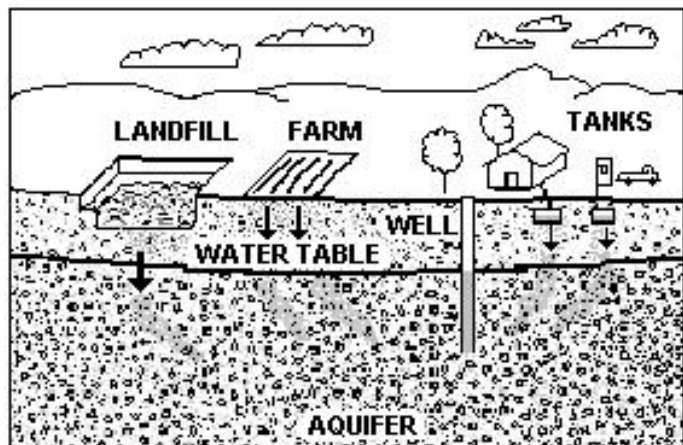


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

large storm events. Maintenance is essential for the proper operation of catch basins and the sediment/water quality basin. Due to the shallow bedrock contaminant discharged through the basin may impact the bedrock aquifer. If you do not have a storm water maintenance plan, work with the Town to develop one. Maintenance plans should include an inspection and maintenance schedule for inlets and outlets. Look for color, turbidity, odor, oil sheen etc. at the outlet. All observations should be recorded and action taken if evidence of a release of hazardous materials such as petroleum products has been observed. Inspect parking areas periodically for evidence of leaks or accidental spills.

Encourage local farmers to contact the Department of Food and Agriculture or National Soil Conservation Service to obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, farmers may complete and follow their own plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practice*. Information on funding and resources is available through the Massachusetts Department of Food and Agriculture.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Swift River Elementary School staff is commended for current protection measures.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply signs key location such along the access road and in the parking area.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Do not use fertilizers and pesticides in Zone I.
- ✓ Use Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.

### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Inform all staff regarding proper use and disposal of household hazardous materials.

### Facilities Management:

- ✓ Concrete or earthen collars around the wellhead should slope away from well.
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator.
- ✓ Refer to the appendices for more information regarding septic systems. The school is currently not registered as a

generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine regulatory requirements.

**Planning:**

- ✓ Work with local officials in Warwick to include the school well's IWPA in an Aquifer Protection District Bylaws and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at

<http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Grant Program Fact Sheet
- Source Protection Sign Order Form
- Very Small Quantity Generator (VSQG) information

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
HAMILTON ORCHARDS



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 3, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Hamilton Orchards
<i>PWS Address</i>	25 West St
<i>City/Town</i>	New Salem, Massachusetts
<i>PWS ID Number</i>	1204002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1204002-01G	115	428	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

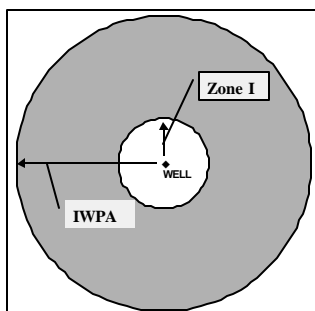
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1204002-01G)**

Zone I = 115 ft.  
IWPA = 428 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic leach fields within the Zone I / IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials, agricultural activities, and floor drains within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**North Adams Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	North Adams Water Department
<i><b>PWS Address</b></i>	City Hall, 10 Main Street
<i><b>City/Town</b></i>	North Adams, Massachusetts
<i><b>PWS ID Number</b></i>	1209000
<i><b>Local Contact</b></i>	Mr. Donald Rounds
<i><b>Phone Number</b></i>	(413) 662-3157

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### Groundwater Sources

MA GIS Zone II ID #: 471

Susceptibility: High

Well Name	Source ID#
Greylock Well #1	1209000-01G

### Surface Water Sources

Source Name	Susceptibility: High
Notch Reservoir	1209000-01S
Broad Brook Intake	1209000-02S
Williams Reservoir	1209000-04S

North Adams is a mid-sized city located in the northwest corner of Massachusetts, in the heart of the Berkshires. The city developed primarily as an industrial and commercial center along the Hoosic River valley. Outside of the valley area, the more mountainous areas are primarily forest and residential land use. The Hoosic River flows primarily north from Cheshire to the center of North Adams, where the river valley narrows significantly and flows west then northwest before it discharges into the Hudson River. The portion of the river that flows west and northwest is the aquifer utilized by the Williamstown and North Adams wells. The North Adams Water Department maintains and operates one groundwater source (Greylock Well 01G) and three reservoirs (Notch Reservoir 01S, Broad Brook Intake 02S and Mt. Williams Reservoir 04S); one additional surface water source (James Brook 03S) is registered as an emergency source. The emergency reservoir will not be assessed in this report.

The Greylock Well (01G) is located within the center of the same confined, buried valley, sand and gravel aquifer in the Hoosic River valley as the Williamstown groundwater sources. Data from the well development indicates the aquifer is under artesian pressure during static conditions. The aquifer is within a glacially deepened bedrock valley that was filled with sand and gravel during the glacial recession (melting) some 12,000 years ago. Glacial Lake Bascom was formed throughout much of the westerly trending Hoosic River valley leaving some areas with an extensive clay confining unit overlying a productive sand and gravel aquifer; other areas of the valley do not have a protective clay layer and are sand and gravel throughout. The clay layer pinches

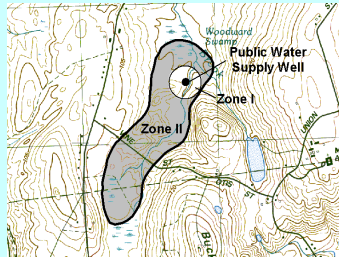
out toward the northerly and southerly edges of the aquifer valley and to the east toward the center of North Adams. The protective confining clay unit pinches out approximately 4,500 feet east of North Adams' Greylock well. The bedrock underlying the aquifer is fractured dolomite, a calcium/magnesium carbonate, that can potentially contribute significant amounts of water to the sand and gravel aquifer.

Although some portions of the aquifer are protected from activities and land use on the ground surface by the clay layer, the aquifer is considered to be highly vulnerable to contamination because the hydrogeologic barrier (i.e. clay) is not continuous throughout the developed recharge area. The Zone II for the Greylock well was delineated as part of the SWAP program utilizing empirical data, analytical modeling and geologic mapping. Although the area is densely developed, the entire Zone II area is served by municipal sewers. Please refer to the attached map to view the boundaries of the Zone II.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



The Mt. Williams Reservoir is the primary water source for the City and is supplemented by the Notch Reservoir. The Williams and Notch Reservoirs are located in the uplands adjacent to the Mt. Greylock State Forest. The City owns approximately 80% to 90% of the watershed area with the state forest encompassing a small percentage of land. The watersheds are located in an area of steep slopes, in the till covered uplands in the southwestern part of the City. The bedrock is composed primarily of the metamorphic rock types of schist and gneiss. Water is pumped from the Notch Reservoir through a main into the watershed of the Mt. Williams Reservoir. The water is discharged into a brook that flows into the Mt. Williams Reservoir. Water from the Mt. Williams Reservoir (which includes the flow from the Notch Reservoir) is filtered through the Mt. Williams Treatment Facility, an alternative flocculation system with rapid sand filtration, iron and manganese removal, pH adjustment for corrosion control and chlorine disinfection prior to distribution.

The Broad Brook Intake is located in Pownal, Vermont and is presently an inactive source of water. The source is not filtered but, when used is chlorinated prior to distribution. The watershed is sparsely populated and primarily forest. The Broad Brook watershed is also located within a till covered upland. Bedrock in this area is also primarily schist and gneiss. There are numerous camps along

the Broad Brook within the Zone A along with few roads throughout the watershed. Some of the camps are on private land and some appear to be on City-owned land.

The Greylock Well is utilized to supplement the surface water supplies. Water from the Greylock Well does not require treatment and is not treated prior to distribution. There are confirmed hazardous waste release sites located upgradient of the Greylock Well within the Zone II contribution area. Monitoring wells are located upgradient of the Greylock Well associated with the ongoing investigation of one release site and groundwater from those wells is regularly monitored to evaluate the impact on the aquifer. Although there is no currently reported impact to the water quality from the Greylock Well, there is continued long term monitoring of the water quality in the aquifer. At this time water from the Greylock Well does not require treatment and is not treated prior to distribution. The DEP Bureau

of Waste Site Cleanup (BWSC) is overseeing the activities and investigation related to that site and may be contacted for additional information about confirmed release sites at 413-784-1100.

For current information on drinking water quality monitoring results and treatment, please request a copy of the most recent Consumer Confidence Report from the Public Water System "Local Contact" listed in Table 1. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

## Section 2: Land Uses in the Protection Areas

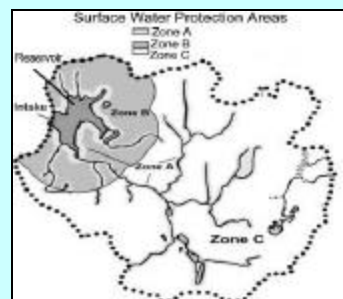
The Zone II area includes a mix of residential, industrial and commercial land use activities. The watershed areas for the North Adams surface water supplies are primarily forest lands; greater than 90% of the watershed lands is protected through City of State ownership. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Activities in Zone A
3. Residential Land Uses
4. Transportation Corridors
5. Hazardous Materials Storage and Use

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



6. Oil or Hazardous Material Contamination Sites
7. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2. The susceptibility of the surface water sources is moderate based on the activities within their protective areas.

**1. Activities in Zone I** – The Zone I for the well is a 400 foot radius around the wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Greylock Well is located within a developed residential/industrial area of the City. Only water supply activities are allowed within the Zone I. However, many public water supplies were developed prior to promulgation of the Department's regulation and contain

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone I of the system well:

**Well 01G** - Thirteen homes, local roads, a school, and athletic fields. The entire area is served by municipal sewer.

#### Zone I Recommendations:

- ✓ To the extent feasible, remove all non water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prohibit new non-water supply activities in the Zone I.

**2. Activities in Zone A** - The Zone A for a reservoir includes all areas within 400 feet of the reservoir shore line and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. Because the Zone A is the area closest to the reservoir and its tributaries, land uses within the Zone A are of particular concern. Therefore, certain activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following activities occur in the Zone As of the system's reservoirs:

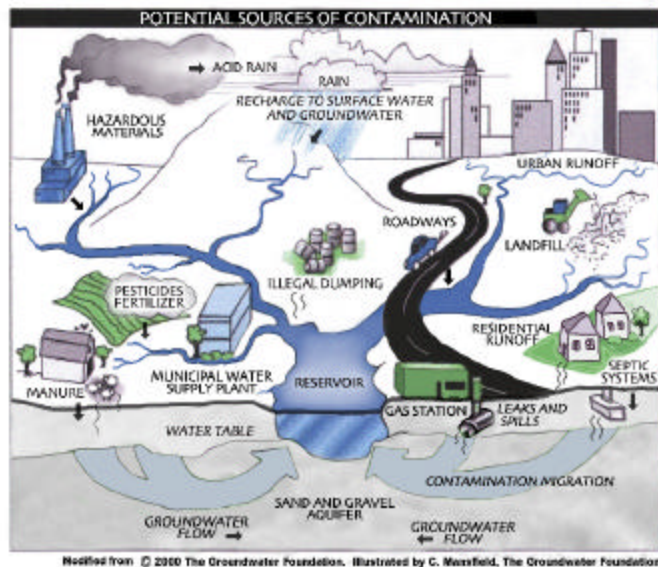


Figure 1: Sample watershed with examples of potential sources of contamination

**Broad Brook (02S)** - There are few local roads in the watershed but numerous camps and residences, in the Zone A of the Broad Brook source, all of which are primitive sites or utilize private septic systems. There is also evidence of extensive access by off road vehicles on both legal and illegal trails throughout the watershed.

**Williams and Notch Reservoirs (01S and 04S)** - There are few roads through these watersheds and the runoff from the road immediately adjacent to the Williams Reservoir is reportedly directed out of the watershed and not toward the reservoir.

#### Zone A Recommendations:

- ✓ Purchase land within the Zone A or protect through conservation restrictions.
- ✓ Enforce no trespassing on Water Department land, particularly in areas along the brooks and closest to the intake. Include signs, patrols and fines for violators as appropriate.
- ✓ To the extent possible, remove all prohibited activities from the Zone A to comply with

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Water Supply Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II	Watershed Source ID	Potential Contaminant Sources*
<b>Commercial</b>					
Auto Repair/Body Shops	10	H	Yes	-	Spills, leaks, or improper handling of automotive fluids, and solvents
Railroad Tracks	1	H	Yes	-	Over-application or improper handling of herbicides, leaks or spills of transported chemicals, maintenance chemicals; fuel storage
Funeral Homes	Few	L	Yes	-	Hazardous chemicals: spills, leaks, or improper handling
Laundromats	1	L	Yes	-	Wash water: improper management
Beauty Salons	3	L	Yes	-	Hazardous chemicals
Car/Truck/Bus Washes	1	L	Yes	-	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	3	H	Yes	-	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Bus and Truck Terminals	2	H	Yes	-	Fuels and maintenance chemicals: spills, leaks, or improper handling
Cemeteries	2	M	Yes	-	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
<b>Industrial</b>					
Chemical Manufacture Or Storage	1	H	Yes	-	Chemicals and process wastes: spills, leaks, or improper handling or storage
<b>Miscellaneous</b>					
Schools	3	M	Yes	-	Laboratories, cleaning materials, fertilizers
Electroplaters	1	H	Yes	-	Solvents and other chemicals: spills, leaks, or improper handling or storage
Aquatic Wildlife	Occasional	H	No	All	Microbial contaminants
Clandestine Dumping	Few	H	Yes	-	Improper use or storage of fuels and other chemicals

Land Uses	Quantity	Threat*	Zone II	Watershed Source ID	Potential Contaminant Sources*
<b>Miscellaneous</b>					
Oil or Hazardous Material Release Sites (MCP-21E)	12	-	Yes	-	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transmission Line Rights-of-Way : <u>Natural gas</u>	1	H/L	Yes	-	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	Numerous	H/M	Yes	-	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	Numerous	H	Yes	-	Spills, leaks, or improper handling or storage of hazardous materials and waste
Large Quantity Hazardous Waste Generators	1	H	Yes	-	Hazardous materials and waste: spills, leaks, or improper handling or storage
Small Quantity Hazardous Waste Generators	6	M	Yes	-	Hazardous materials and waste: spills, leaks, or improper handling or storage
Very Small Quantity Hazardous Waste Generator	Numerous	L	Yes	-	Hazardous materials and waste: spills, leaks, or improper handling or storage
Aboveground Storage Tanks	Numerous	M	Yes	-	Spills, leaks, or improper handling or storage of hazardous materials and waste
<b>Residential</b>					
Fuel Oil Storage (at residences)	Numerous	M	Yes	Few—02S	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Yes	Few -02S	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Few	M	No	02S	Hazardous chemicals: microbial contaminants, and improper disposal

**Notes:**

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

DEP's Zone A requirements.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.

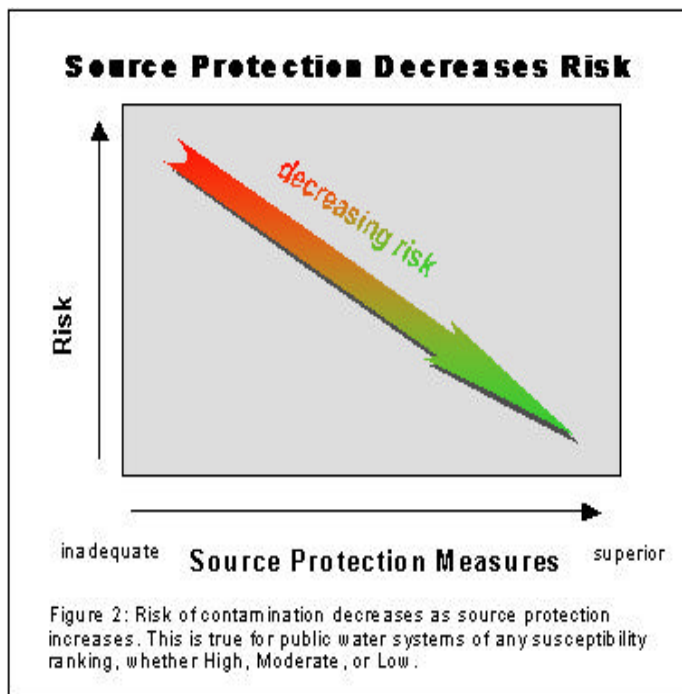
**3. Residential Land Uses** – The watersheds have very small percentages of residential land use and they are predominantly forested. However, approximately 48% of the Zone II consists of residential land use. The entire Zone II area is served by municipal sewers. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

**Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**4. Transportation Corridors** - There are numerous roads located throughout the Zone II and few within the watersheds. Catch basins and natural drainage, transport stormwater from roadways and adjacent properties to the ground, recharge areas, streams, rivers or reservoirs. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, car washing, pet waste, de-icing materials, pesticides and fertilizers or accidental spills. Additionally, roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. There reportedly some illegal dumping evident in the protection areas. Clandestine dumping is identified as a significant threat to water supplies.

Railroad tracks run directly through the Zone II along the edge of the aquifer. Rail corridors serving passenger or freight trains are potential sources of



contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

**Transportation Corridor Recommendations:**

- ✓ Continue routine inspections of the watershed area and the Zone II for illegal access, dumping and spills. Increase patrols in areas of high access.
- ✓ Post “No Trespassing” signs in high access areas and impose fines for trespassers and identified illegal dumpers.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Coordinate with the City DPW and the State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff. For information on DEP’s S. 319 Nonpoint Source Competitive Grants Program and upcoming funding opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ Storm Drain Stenciling Program - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming NPDES Phase II Stormwater Rule requiring some communities to complete stormwater mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.
- ✓ Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).

The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Bruce Philbrick, at the local office in Pittsfield office at 413-443-6867 (his e-mail address is [bruce.philbrick@mapittsfield.fsc.usda.gov](mailto:bruce.philbrick@mapittsfield.fsc.usda.gov)). Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.

- ✓ Visit DEP’s Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**5. Hazardous Materials Storage and Use** – Approximately 13% of the Zone II of the North Adams well includes commercial and/or industrial land uses; the entire area is served by municipal sewers. Many businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local Boards of Health and businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Request that the Board of Health adopt a floor drain regulation in the City. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.



- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Bruce Philbrick, at the local office in Pittsfield office at 413-443-6867 (his e-mail address is [bruce.philbrick@mapittsfi.fsc.usda.gov](mailto:bruce.philbrick@mapittsfi.fsc.usda.gov)).

**6. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0000122, 1-0000126, 1-0000342, 1-0000437, 1-0000460, 1-0000475, 1-0000584, 1-0000881, 1-0001061, 1-0010694, 1-0010727, and 1-0013902. Refer to the attached map and Appendix C for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites. Contact the Bureau of Waste Site Cleanup for more information on these sites.

**7. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, North Adams does not have water supply protection controls that meet DEP's Wellhead Protection regulation 310 CMR 22.21(2). Wellhead Protection and Surface Water Supply Protection Plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. North Adams in-town reservoirs are well protected by City and state land ownership. The City owns some land around the Broad Brook source. The watershed for Broad Brook is primarily rural but there are no land use controls for the Zone A. The City, does however have an approved Surface Water Supply Protection Plan for that source.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan."
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulation 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone II and watersheds that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

## Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- preparing a Water Supply Protection Plan for and efforts to upgrade the Broad Brook source infrastructure that is

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and the town boards.

- located in Vermont,
- conducting routine inspections of the watersheds, and
- maintaining detailed knowledge of the activities within the watershed and Zone II.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I and Zone As, regularly; when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance on NPS pollution at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### ➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### ➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

#### ➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

#### ➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use and regulations related to watersheds and groundwater protection. These controls may include health regulations, discharge prohibitions, general ordinances, and zoning by-laws/ordinances that prohibit or control potential sources of contamination within the protection areas.

#### ➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The Massachusetts Department of Food and Agriculture's Agricultural Environmental Enhancement Program (AEEP) provides funding to farmers to install a variety of water quality protection practices. For more information on the program contact the coordinator, Susan Phinney, at (617) 626-1772, Susan.Phinney@state.ma.us.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: if funding is available, each spring DEP posts a new Request for Response for the grant program (RFR) on the website <http://www.comm-pass.com/>.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II and watershed areas. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I and Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	<b>YES</b> 01S, 03S  <b>NO</b> 01G, 02S	Follow Best Management Practices (BMPs) that focus on good house-keeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.  To the extent possible, remove prohibited activities in Zone As to comply with DEP's Zone A requirements. City owns 82% of the watershed.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	<b>YES</b>	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b> 01G, 02S	Monitor non-water supply activities in Zone I and prohibited activities in Zone As, and investigate options for removing these activities.
<b>Municipal Controls</b> (Zoning Bylaws/Ordinances, Health Regulations, and General Bylaws/Ordinances)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	Working with the Planning Board to review land use controls to see that they meet current requirements of 310 CMR 22.21(2) and 310 CMR 22.20C. Refer to <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Contact Town officials in Pownal, VT and provide them with information about the boundaries of the watershed. Assist and encourage those representatives in the active protection of the watershed lands.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>YES</b> - Surface <b>NO</b> -Wellhead	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	<b>NO</b>	Develop a committee to include representatives from citizens' groups, neighboring communities, and the business community.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	Request adoption of floor drain and hazardous materials handling regulations. For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> .
Does the PWS provide watershed protection education?	<b>YES</b>	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Activity Class	Permitted Activity	Facility Description
	Allied Auto Parts/Napa	432 State Road	North Adams	VSQG	HANDLR	Auto Repair
34605	Bator R B	Lime St	North Adams	VSQG	HANDLR	
131418	Berkmatics Inc	59 Demond Ave	North Adams	SQG	HANDLR	
	Braytonville Garage Inc.	10 State Road	North Adams	VSQG	HANDLR	Auto Repair
35642	Collision Shop	5r River St	North Adams	VSQG	HANDLR	Auto Repair
131910	Commonwealth Sprague (AAG, Inc.)	11 Brown St	North Adams	RES	PLANT	Manufacturing
		11 Brown St	North Adams	LQG	HANDLR	
		11 Brown St	North Adams	LQG-MA	HANDLR	
		11 Brown Street	North Adams	SWMIN	DISCH	
		11 Brown St	North Adams	LQTU	TURRPT	
136848	Cumberland Farms #2148	594 Mohawk Trail	North Adams	FULDSP	FULDSP	Gas Station
130570	Excelsior Printing Co	60 Roberts Drive	North Adams	VSQG	HANDLR	Printer

130570	Excelsior Printing Co	60 Roberts Drive	North Adams	VQG-MA	HANDLR	Printer
136769	Getty 629	148 Eagle St	North Adams	FULDSP	FULDSP	Gas Station
262542	Getty 630	326 State Rd	North Adams	FULDSP	FULDSP	Gas Station
135802	Gibbs Oil 1372	303 State Rd	North Adams	FULDSP	FULDSP	Gas Station
330609	Haddad Motors Of North Adams	179 State Road	North Adams	VSQG	HANDLR	Sales/Repair
330609	Haddad Motors Of North Adams	179 State Road	North Adams	VQG-MA	HANDLR	Sales/Repair
28269	K M Motor Sales Inc	51 W Main St	North Adams	VSQG	HANDLR	Sales/Repair
23034	Maxymillian Technologies Inc	86 S.Main St	North Adams	RCLY		
133673	Ma Elec Co North Adams Satellite	74 Brown St	North Adams	VSQG	HANDLR	
130572	Modern Aluminum Anodizing	510 State Rd	North Adams	BLW-SW	HANDLR	Former Metal Plating
130572	Modern Aluminum Anodizing	510 State Rd	North Adams	BLW-IW	EPIC	
130572	Modern Aluminum Anodizing Corp	510 State Rd	North Adams	SQG	DISCH	
130572	Modern Aluminum Anodizing Corp.	510 State Rd	North Adams	LQTU	HANDLR	
177916	Monro Muffler Brake Number 148	207 State Rd	North Adams	SQG	TURRPT	Auto Repair
303529	North Adams Dswm Illegal Site	Massachusetts Ave	North Adams	ILLGL		



34561	North Adams Tire & Service	163 River St	North Adams	VSQG	HANDLR	Repair
28270	Scarafoni Dick Ford Inc	179 State Rd	North Adams	VSQG	HANDLR	Sales/Repair
136797	State Road Shell	1 State Rd	North Adams	FULDSP	FULDSP	Gas Station
28840	Sun Cleaners	111 River St	North Adams	VSQG	HANDLR	Cleaners
28840	Sun Cleaners	111 River St	North Adams	BLW-AQ	PLANT	
33085	Verizon - New England Inc	Telco Ln	North Adams	SQG-MA	HANDLR	
30318	Walt's Service Center	54 River St	North Adams	VSQG	HANDLR	Auto Repairs
	West End Auto Body, Inc.	362 State Road, Route 2	North Adams	VSQG	HANDLR	Auto Repairs

## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Gibbs Oil	303 State Street	North Adams	Gas Station	1 Wall		10,000	Gasoline
				1 Wall		10,000	Gasoline
				1 Wall		10,000	Gasoline
				1 Wall		550	Fuel Oil
Getty Station	326 State Street	North Adams	Gas Station	1 Wall		10,000	Gasoline
				1 Wall		8,000	Gasoline

				1 Wall		8,000	Gasoline
O'Connell Oil Associates, Inc,	1 State Street	North Adams	Gas Station	2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000.00	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000122	Ashton Ave.	North Adams	Oil
1-0000126	Brown St	North Adams	
1-0000342	180 River St	North Adams	
1-0000437	Cole St	North Adams	
1-0000460	87 Marshall St	North Adams	
1-0000475	1 State Road	North Adams	Oil
1-0000584	Rt. 2	North Adams	
1-0000881	51 Waldon Street	North Adams	
1-0001061	78 State Rd.	North Adams	Oil

1-0010694	74 Brown St	North Adams	Oil
1-0010727	74 Brown St	North Adams	Hazardous Material
1-0013902	506 State Rd.	North Adams	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Northampton Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Northampton Water Department
<i><b>PWS Address</b></i>	237 Prospect Street
<i><b>City/Town</b></i>	Northampton, Massachusetts 01060
<i><b>PWS ID Number</b></i>	1214000
<i><b>Local Contact</b></i>	Mr. Charles Borowski
<i><b>Phone Number</b></i>	(413) 587-1098 x301

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### Groundwater Sources

Zone II - MA DEP GIS # 109

Source ID#

Well Name	Susceptibility: High
GP Well #1	1214000-01G
GP Well #2	1214000-02G

### Surface Water Sources

Source Name	Susceptibility: High
Mountain Street Reservoir	1214000-01S
Ryan Reservoir	1214000-03S
West Whately Reservoir	1214000-04S

Northampton is a medium sized community in central western Massachusetts with a diverse economic base of education, retail, commercial and industry. The Northampton Water Department maintains and operates two wells and three reservoirs. The two wells for the Northampton Water Department are located within the same unconfined, sand and gravel aquifer, in the central area of Northampton. Both wells are located within the same Zone II protection area and each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of a hydrogeologic barrier (i.e. confining clay layer) that can prevent contaminant migration from the ground surface. Please refer to the attached map of the Zone II area.

The Mountain Street Reservoir and its watershed are located on the border of Williamsburg, Whately and Hatfield. The Ryan and West Whately Reservoirs are located in the northwest corner of Whately. The watershed areas for the Ryan Reservoir extend into Williamsburg, Conway and Whately, and the watershed areas for West Whately Reservoir extend into Williamsburg. Water from the Ryan and West Whately Reservoirs can be directed into the Mountain Street Reservoir or directly into the distribution main.

Water from the wells is not treated prior to distribution; water from the reservoirs is disinfected with chlorine and the pH is adjusted with sodium hydroxide and zinc orthophosphate is added for corrosion control prior to distribution. For

current information on monitoring results and treatment, please call the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

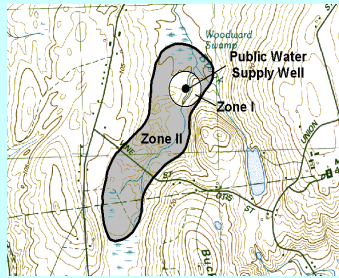
## Section 2: Land Uses in the Protection Areas

The Zone II and watersheds for Northampton are primarily forested, with smaller portions consisting of agriculture, residential, and commercial/industrial land uses (refer to the attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.



## What is an Aquifer Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



## Key Land Uses and Protection Issues include:

1. Activities in Zone I - 400 foot radius around wells
2. Activities in Zone A - 400 feet from reservoir's edge and 200 feet along either side of the reservoir feeder brooks.
3. Residential Land Uses
4. Transportation Corridors
5. Hazardous Materials Storage and Use
6. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone I Wellhead Protection Area-** The Zone I for each of the wells is a 400 foot radius around each of the wellheads. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Northampton does not own the entire Zone I, however, local zoning ordinances limit activities within the Zone I. Many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply

activities occur in the Zone Is of the system wells:

**Well 01G** - There is a local road and one home within the Zone I.

**Well 02G** - There are two homes and an electrical transformer station on the edge of the Zone I.

### Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from each Zone I to comply with regulatory requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as household hazardous chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

**2. Activities in Zone A of the reservoirs** - The Zone A for the reservoirs includes all areas within 400 feet around each of the reservoirs and within 200 feet of either side of all streams that flow into the reservoirs. Land use activities within a Zone A may have an impact on surface water sources. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. while road run off can carry other contaminants. There are local roads and small parking areas in the Zone As of the system's reservoirs.

### Zone A Recommendations:

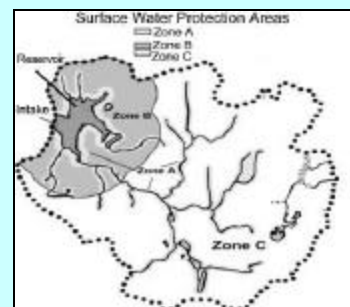
- ✓ Continue to monitor and protect the Zone As and keep any new prohibited activities out of the Zone A.

**3. Residential Land Uses** – Approximately 50% of the Zone II land area and approximately 2% of the total watershed lands consist of residential areas. Although most of the Zone II area is served by municipal sewer, some areas are not and the reservoir watersheds are not served by sewer. All areas not served by sewers, rely on septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## For More Information

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town and City boards.

properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing or accidents.

#### Residential Land Use Recommendations:

- ✓ Make available for distribution the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners in the city and in all host communities to managed development in the water supply protection areas.
- ✓ Continue current efforts to purchase land, conservation restrictions and pursue Right of First Refusal as necessary to further protect the water supplies.

**4. Transportation Corridors** - Local roads run through the protection areas for all of the sources. Roadway construction, maintenance, and typical use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways may be sites for illegal dumping of hazardous or other potentially harmful wastes. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

There are numerous unpaved, ways as well as legal (authorized) and illegal (unauthorized) trails throughout the watersheds and Zone II. Most of these ways and trails through the watershed are not maintained at all or are minimally maintained. The resulting erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, potentially resulting in additional water treatment costs if they continue unchecked and pose a potential threat to public health and safety. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Evidence of access to the watershed was observed and anecdotal

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

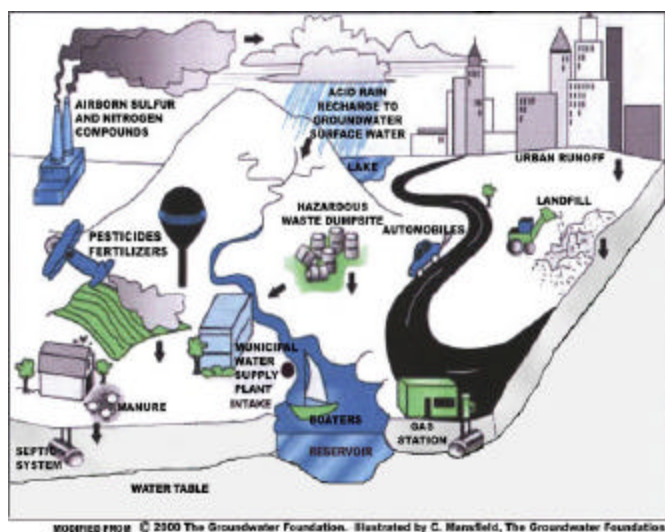


Figure 1: Sample watershed with examples of potential sources of contamination

information indicates access throughout the watersheds. Unmanaged access may also result in vandalism, illegal dumping and access to the reservoir resulting in water quality impairment.

Northampton continues to negotiate with private land owners, recreation groups and the Department of Environmental Management regarding public access and maintenance of trails and ways. They continue to assess the relationship of erosion along trails and turbidity in the reservoir and feeder streams. The City is investigating the disposition of trails and old roads that access the Conway State Forest and other remote areas within the watershed in an effort to manage access and control erosion on trails through the watershed.

#### Transportation Corridor Recommendations:

- ✓ Continue investigating disposition of all roads, ways and “trails” as required. The Department may be of

(Continued on page 6)

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Aquifer Zone II	Watershed Source ID	Potential Contaminant Sources*
<b>Agricultural</b>					
Forestry Operation	Throughout	L	-	All	Have approved forestry plans. Leaks, spills, or improper handling of petroleum products, erosion.
<b>Industrial</b>					
Manufacturer (Proposed)	1	H	Yes	-	Solvents, inks and process waste: spills, leaks, or improper handling or storage of hazardous materials. Area is served by sewer.
<b>Residential</b>					
Fuel Oil Storage (at residences)	> 100 in ZII Few in Watersheds	M	Yes	01S, 03S	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	> 100 in ZII Few in Watersheds	M	Yes	01S, 03S	Over application or improper storage and disposal, of pesticides improper use and handling of petroleum products
Septic Systems / Cesspools	> 100 in ZII Few in Watersheds	M	Yes	01S, 03S	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>					
Aquatic Wildlife	(Actively managed)	H	-	All	Microbial contaminants
Elementary School	1	M	Yes	-	Spills, leaks, or improper handling or storage of household type hazardous materials; large parking area
Stormwater Drains/ Retention Basins	Many in ZII Few in Watersheds	L/H	Yes	All	Erosion, debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	H	-	01S	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors—Legal and illegal access	Several	M/H	Yes	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides—vegetation control: over-application or improper handling. Illegal access to watershed, potential of illegal dumping.
Utility Substation Transformers	1	L	Yes	-	MODF (oils): spills, leaks, or improper handling. The utility has stated that the transformer MODF does not contain PCBs

See Table notes on Page 6.

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

assistance with discussions regarding the control of access.

- ✓ Continue current patrols of watershed land and active management including enforcement of no trespassing in designated areas.
- ✓ Continue to evaluate options for management of access to ways. Include evaluation of continuing current practice of full access, closing roads to all traffic, closing road to all commercial traffic and limiting access only to residents with a locked gate and key for residents only. Request abandonment of former county roads as appropriate from MA DCAM or the MA Legislature. Continue proactive management of activities.
- ✓ Continue to regularly inspect watershed and Zone II for illegal activities and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Towns and the City to have catch basins or other storm water management structures inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with City and town officials to prioritize the mapping of storm drains in the Zone II and the watersheds for the Phase II Stormwater Rule.
- ✓ Promote BMPs for stormwater management and pollution controls. Consider a storm drain stenciling program.
- ✓ Commercial agricultural facilities and rural municipalities may be eligible for funding BMPs through the NRCS. Contact the NRCS about the Environmental Quality Incentives Program (EQIP).

**5. Hazardous Materials Storage and Use** – There are no industrial activities within the watersheds of the reservoirs. However, it is proposed that the water treatment facility be located immediately adjacent to one of the reservoirs. There is no municipal sewer and therefore the facility is proposed to utilize lagoons. Less than 1% of the Zone IIs for Northampton's wells is commercial and industrial land uses. There is only one large facility within the Zone II area. Presently, that facility is idle, however, a business associated with printing manufacturing, presently located within Northampton is reportedly planning to move or expand into the facility. Many businesses and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials as part of their operations. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to floor drains leading directly to the ground. The facilities located within the Zone II area are connected to the municipal sewer system.

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.



### Hazardous Materials Storage and Use Recommendations:

- ✓ Work with Board of Health and Planning Department in assisting local businesses with best management practices for protecting water supplies as appropriate. Make available the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Consult with the Board of Health to ensure local businesses register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Consult with the Board of Health regarding local businesses and Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ Ensure compliance with regulations for management of treatment chemicals including proper containment, emergency response plan for delivery and handling, and stormwater management.
- ✓ Provide the Planning Board and Board of Health with information from the DEP BWP and Office of Technical Assistance regarding existing regulations and assistance available to printing facilities <http://www.state.ma.us/dep/erp/erpforms.htm> and <http://www.state.ma.us/ota/#links>.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>.

**6. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, Northampton and Williamsburg do have water supply protection controls. The controls should be compared with DEP’s Wellhead Protection regulations 310 CMR 22.21(2) or Surface Water Protection regulations 310 CMR 22.20 (b) and

### Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

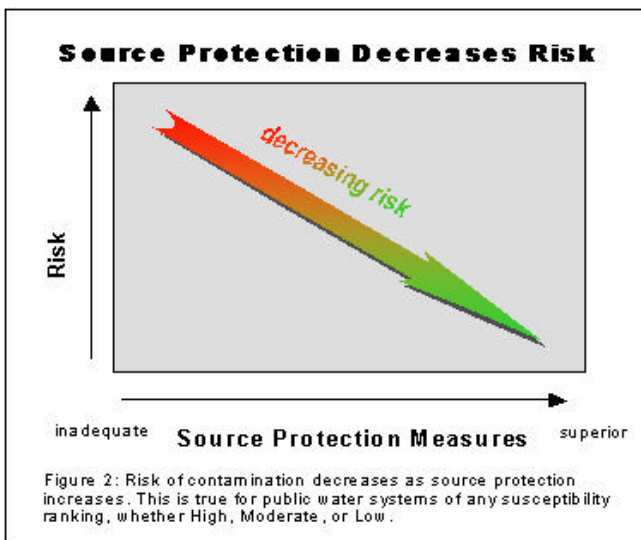
- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

(c) to ensure that they are up to date. Wellhead Protection and Surface Water Supply Protection Plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. Northampton has a Surface Water Supply Protection Plan and actively manages

the watershed lands. There are resources available to help communities develop and implement plans for protecting drinking water supply sources. Northampton received a Source Water Protection grant from the Department to assist in further protection of their surface water supplies.

### Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials in Williamsburg, Whately, and Conway to compare local surface water supply protection controls with current MA Surface Water Protection regulations 310 CMR 22.20 (b) and (c) . If they do not meet the current regulations, update the controls. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.



Other land uses and activities within the Zone II and watersheds that are potential sources of contamination are

included in Table 2. Refer to Appendix B for more information about these land uses.

One land use that is not included in the matrix is a sportsmen's shooting range that is located within the Zone II. The facility was visited by representatives of the Department as part of the Massachusetts Lead Shot Initiative who toured shooting range facilities, requested actions as appropriate and provided information on management practices for shooting ranges including how to prepare and implement an Environmental Stewardship Plan. For further information about this or other facilities, please contact Mr. Thomas Keefe, the Department representative for the Lead Shot Initiative in the Springfield Regional Office at 413-784-1100.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Removal of all Underground Storage Tanks (UST) within the Zone II through a town grant program.
- Working cooperatively with landowners within the water supply protection areas to protect the water supplies.
- Working with the town council to allow mandatory water use restriction for water conservation.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue to inspect the Zone Is and As regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams in all host communities and the City to ensure that they are aware of the stormwater drainage in your protection areas and to cooperate by contacting the water supplier when responding to spills or accidents within the protection areas.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring, on or about May 1, DEP posts a new Request for Response (RFR) application for the grant programs. The applications are usually due on or about July 1.



➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II or watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I and Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I ?	<b>No</b>	Zone Is are controlled through a Zoning Ordinance and oversight by the Water Department. Consider Right of First refusal and when possible purchase Zone I lands.
Are the Zone I and Zone A posted with signs to limit access?	<b>Yes Zone II and Watershed</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988. No trespassing signs are acceptable.
Are the Zone I and Zone A regularly inspected?	<b>Yes</b>	Continue regular inspections of drinking water protection areas.
Are water supply -related activities the only activities within the Zone I and Zone A?	<b>No</b>	Monitor non-water supply activities and continue investigating and implementing options for best management practices within these areas.
<b>Municipal Controls</b> (Zoning, Health Regulations, and General Ordinances)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2) ?	<b>Wellhead Yes</b>	Protections are in place for wells and Zone II. Periodically review for compliance with the most recent regulations. Work with the Planning Board and the Board of Health.
Do neighboring communities have Surface Water Protection Controls that meet 310 CMR 22.20C and protect the water supply protection areas extending into their communities?	<b>Partially (Williamsburg at the Mountain Street Res.)</b>	Work with the communities of Whately, Williamsburg, Hatfield and Conway to encourage them to compare their current protections for the watershed lands with the most recent regulations listed above. Refer to <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model bylaws, ordinances and health regulations, and current regulations 310 CMR 22.21(2) and 310 CMR 22.20C. MA DEP can be of assistance to communities.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>Yes - Surface No - Well</b>	A Surface Water Supply Protection Plan has been approved. Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>Yes</b>	Augment plan by developing a joint emergency response plan with fire departments, Board of Health, DPWs, and local and state emergency officials. Coordinate emergency response drills with local teams in all watershed towns.
Does the municipality have a watershed and wellhead protection committee?	<b>No</b>	Develop committees, include representatives from citizens’ groups, neighboring host communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities in the protection areas?	<b>N/A - Surface No - Wells</b>	There are no commercial or industrial activities in the watersheds. There is an industrial facility within the Zone II. For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Be sure the Planning Board and Board of Health are aware of the protection area.
Does the PWS provide watershed protection education?	<b>Yes</b>	Currently outreach is to school groups, university groups, and consumers. Increase residential outreach through bill stuffers, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at activities within the protection areas.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Linda Manor Nursing Home

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Linda Manor Nursing Home
<i>PWS Address</i>	349 Haydenville Road
<i>City/Town</i>	Northampton, Massachusetts
<i>PWS ID Number</i>	1214001
<i>Local Contact</i>	Mr. David LaPlante
<i>Phone Number</i>	1-413-238-5344

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1214001-01G	276	733	Moderate
Well #2	1214001-02G	267	688	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Northampton is a medium sized city in western Massachusetts. The Linda Manor Nursing Home is located on the north end of Northampton on Haydenville Road and serves a population of approximately 200 residents and staff. Although Northampton does have a municipal water system and a municipal wastewater treatment facility, the hydraulics in the water system were not conducive to serving the facility. Therefore, the nursing home utilizes two, on-site water supply wells however, wastewater is discharged to the municipal sewer system. The facility uses natural gas as a fuel source and has removed the underground storage tank that formerly stored fuel oil. The facility

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

maintains an emergency generator with a diesel fuel storage tank within a containment structure.

Well #1 is a 6-inch diameter, 300-feet deep, bedrock well and has an approved withdrawal rate of 10.4 gpm. The wells are located approximately 276 feet east of the building. Well #2 is a 6-inch diameter, 280-feet deep, bedrock well and has an approved withdrawal rate of 9.0 gpm. Well #2 is located approximately 25 feet from Well #1. Wells #1 and #2 were developed and approved through the New Source Approval Process. Although each well could pump independently, the wells currently operate simultaneously. Both wells are located with pits that have on occasion had standing water in the pit. The facility also maintains a third well for fire protection that is located in the front of the facility; that well is not connected to the potable water supply system. At the time of the assessment, there was no cap on the third well. Subsequently, the maintenance operator had a temporary cap installed on the casing.

The Zone I is the protection area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #1, based on an approved withdrawal rate, are 276 feet and 733 feet, respectively. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #2, based on an approved withdrawal rate, are 267 feet and 688 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

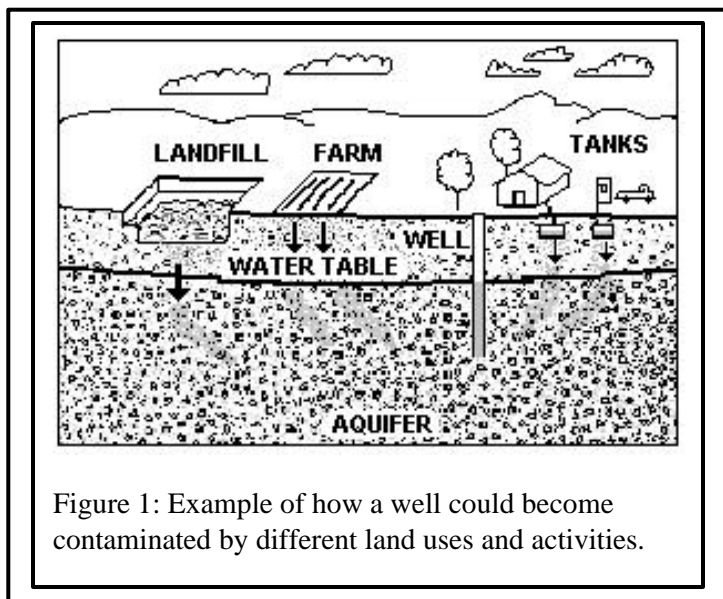
Both wells withdraw water from the bedrock aquifer. The complex is located on an upland area underlain by apparently a thick layer of till. Driller's logs refer to 155 feet of hardpan over bedrock. Geologic maps of the area identify the bedrock as phyllite and schist of the Gile Mountain Formation. Although there is a thick till layer, there is no clear evidence that the till acts as a continuous confining unit in the immediate area. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The water does not receive treatment. For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Internal transportation/parking	Both	Both	Moderate	Limit road deicing materials usage and monitor parking areas.
Nursing home	No	Both	Moderate	Supply BMPs to staff regarding waste disposal
Septic system components	Both	Both	Moderate	Continue to maintain septic system and protect it from improper disposal

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The Zone Is for the wells are in compliance with the DEP Zone I requirements that restrict activities to only those associated with water supply or passive, non-threatening activities. The IWPA's encompass the entire complex including the residential area, the generator fuel oil storage area (inside containment), and septic system components. The facility chlorinates the water prior to distribution.

**Key issues include:**

1. **Zone I,**
2. **Transportation/parking,**
3. **Nursing Home/Institutional, and**
4. **Above ground fuel storage.**

### Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the Nursing Home supply wells is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the IWPA.

Please refer any questions about water quality at the facility to the contact person listed in Table 1. Continued monitoring and site management is recommended to prevent accidents and minimize threats within the Zone I and IWPA protection areas of the wells.

**1. Zone I** – The water supplier owns the entire Zone I area and there are only a few parking spaces located within the paved area on the edge of the approved Zone Is. At the time the facility was built, the DEP approved these Zone Is as being in compliance. Systems not meeting DEP Zone I requirements for ownership or control, or that have non-conforming activities within Zone I, must receive DEP approval and address Zone I issues prior to conducting work in Zone I, increasing water use or modifying systems. Systems with conforming Zone Is may not allow threatening activities within the Zone I to occur.

#### **Zone I Recommendations:**

- ✓ Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas. Do not allow storage or additional parking in the Zone I area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Monitor and inspect the wells and pits on a regular basis to ensure the integrity of the caps and seals. Review alternatives for preventing standing water in the well pits and sampling taps for the wells.

**2. Transportation corridor/parking** – An internal roadway and a few parking spaces are located in the Zone Is. The remainder of the facility and the parking areas are within the IWPA. Storm drains discharge to the city storm system.

#### **Transportation corridor Recommendations:**

- ✓ Monitor all parking areas and continue to ensure the drainage flows away from the wells.
- ✓ Prepare an Emergency Response Plan that includes coordination among the DEP, the Town, and the State Police in the event of an accident near the

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

wellhead.

**3. Nursing Home/Institutional Land Use** – The nursing home is located within the IWPA's. If managed improperly, activities associated with residential/institutional areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include cleaning materials, medications, automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used generally in homes are potential sources of contamination.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site, <http://www.state.ma.us/dep/brp/wm/nonpoint.htm> for additional information.

### Residential Land Use Recommendations:

- V Educate staff, particularly maintenance staff on best management practices (BMPs) for protecting water supplies. Focus efforts on management and disposal of cleaning materials and potentially hazardous materials.

**4. Aboveground fuel oil storage** – There is one diesel AST located adjacent to the building within the IWPA of both wells. A small quantity of petroleum products for maintenance equipment is also stored within the containment structure. If managed improperly, fuel oil tanks and associated fuel lines can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- V Any modifications to the tanks must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- V Continue to monitor all activities associated with the fuel oil especially delivery.
- V Have spill containment/absorbent materials available on-site.
- V Sleeve all fuel lines that have the potential to leak outside of the containment structure.

## 4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Please review and adopt the key recommendations above and as follows as is feasible:

### Priority Recommendations:

- V Inspect the wells regularly and ensure there is no standing water in the pits. Consider alternatives to resolve the issue and ensure the integrity of the seals on well caps and sampling taps.

### Zone I:

- V Prohibit any new non-water supply activities from Zone I.
- V Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:



- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

#### **Planning:**

- ✓ Request that the City include the IWPA for your and other water systems in the water supply protection district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding Sources:**

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Northfield Water District**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Northfield Water District
<i><b>PWS Address</b></i>	22 Stowbridge Road
<i><b>City/Town</b></i>	Northfield
<i><b>PWS ID Number</b></i>	1217000
<i><b>Local Contact</b></i>	Steven Malsch
<i><b>Phone Number</b></i>	413-498-4342

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

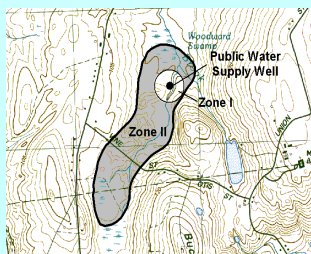
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**Zone II #:** 449

**Susceptibility:** High

Well Names	Source IDs
Well #1	1217000-01G

The Town of Northfield is a primarily agricultural and rural community in Western Massachusetts along the Vermont border. The Connecticut River bisects the northern half of the town and forms the western border of the southern half of Northfield. The Connecticut River valley is relatively narrow through this area and the remainder of the town is hilly terrain. There is one well serving the Northfield Water District, located along the Mill River off of Stowbridge Road. The well is a gravel developed well located in an unconfined narrow bedrock valley buried within glacially deposited sand and gravel. There is no evidence of a confining (protective) clay layer in the vicinity of the well. Wells located in an unconfined aquifer are considered to have a high vulnerability to potential contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration into the aquifer from the surface. The well has a Zone I protective radius of 400 feet based on an approved withdrawal rate. The Zone II, recharge area for the well was delineated as part of the SWAP program utilizing empirical data developed during an extended duration pumping test, analytical modeling and hydrogeological mapping. The District does not own the entire Zone I. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

The surficial deposits at the site are mapped as alluvial fan sand and gravel deposits. Surficial features surrounding the site are mapped as glacial outwash deposits of sand, gravel and silt. There is little information about the construction of the well but it is believed to be an 8 inch diameter gravel developed well, approximately 57 feet deep. The bedrock geology at the well site is mapped as a fine-grained amphibolite with interbeds of light-green epidote of the Crag Mountain Formation. The area to the northeast of the well is mapped as thick-bedded greywacke or quartz schist. There are two major faults mapped in the area, the eastern Connecticut border fault and the Mill Brook Fault to the south.

Sodium hydroxide is added to the water prior to distribution to adjust the pH of the water for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Northfield is a mixture of residential, agricultural, and light commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous Materials Storage and Use

5. Comprehensive wellhead protection planning
6. Agricultural Activities

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for the well is a 400-foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The District does not own the entire Zone I radius; there are activities such as pasture lands, residences and roads within the Zone I.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.
- ✓ Consider entering into an agreement of right-of first refusal for the potential future purchase of the Zone I land or a conservation restriction to control any future activities within the Zone I land.

**2. Residential Land Uses** – Approximately 29% of the Zone II consists of residential areas. Northfield does not have a public sewer; therefore, all residences are assumed to use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to

the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

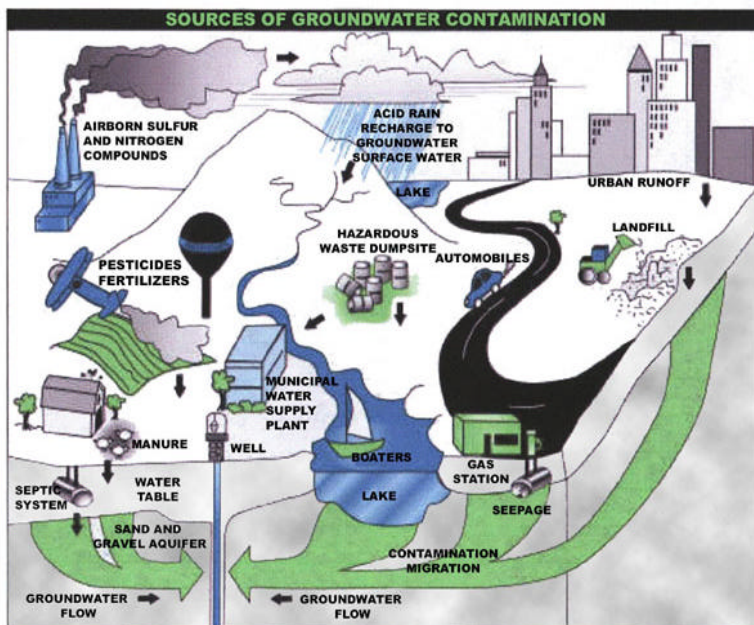
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

#### **What are “BMPs?”**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**3. Transportation Corridors** - Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catchbasins. Much of the area is not served by stormdrains. However, road runoff should be monitored especially along the Warwick Road that runs alongside the Mill Brook and in the immediate vicinity of the well. It is possible that the Mill Brook contributes water to the aquifer under stressed conditions. Emergency response teams should especially be aware of the well and Zone II location.

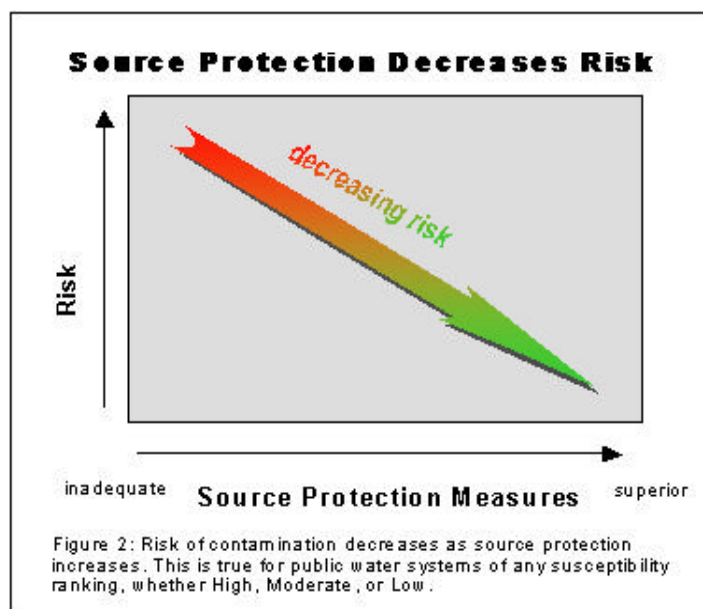
#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town to consider the drainage patterns in the vicinity of the Zone II and the well.
- ✓ Work with the Town to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II and along the Mill Brook can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet

available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Hazardous Materials Storage and Use** – Approximately one percent of the land area within the Zone II is designated as commercial land use. An Auction Barn is located in this area. As an auction facility, it is unknown if hazardous materials are brought in and stored before auction. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**





### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	1	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cess-pools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling (residential)
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Utility Substation Transformers	1	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environ-</p>			



- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**5. Protection Planning** – Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Northfield has a protection plan in place, but it needs updates to fully comply with DEP’s regulations. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Protection Planning Recommendations:**

- ✓ Refer to the recommendations included in the Zone II report. Encourage the Planning Board to adopt these recommendations and contact the Department for any assistance they may require.
- ✓ Update current Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



**6. Agricultural Activities** – Croplands and pasture lands make up 38% of the land uses in the Zone II. There are corn and hayfields in the Zone II, in close proximity to the Zone I. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Be sure all farmers are aware that they are within your Zone II. The DFA, Pesticide Bureau regulates the use of pesticides within sensitive areas.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of

contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with commercial farmers in your protection areas to make them aware

of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

- ✓ Supply BMPS to land owners that are hobby farmers to control, fertilizer, pesticide and manure management.
- ✓ Prepare a Wellhead Protection Plan to evaluate existing threats and address future planning for the Water District and the community.

#### **➤ Partner with Local Businesses:**

Since many businesses and industries, including small businesses, use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### **➤ Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

#### **➤ Plan for the Future:**

One of the most effective means of protecting water supplies is planning, such as the adoption of local controls to protect watersheds and ground water. These controls may include health regulations, general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## Section 4: Appendices

- A. Protection Recommendations
- B. Additional Documents on Source Protection

### Additional Information

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Consider obtaining conservation restrictions or right of first refusal on land within the Zone I not owned or controlled by the PWS.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is. Request use of BMPs on pasture land in Zone I.
<b>Municipal Controls</b> (Zoning By laws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	Update the Town’s “Aquifer Protection District” bylaw to meet DEP’s best efforts for wellhead protection. Refer to recommendations in Zone II report.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Work to establish a committee; include representatives from other water suppliers, citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at commercial, industrial and municipal uses within the Zone II.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0012353	54 Warwick Avenue	Northfield	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**East Northfield Water Company**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	East Northfield Water Company
<i><b>PWS Address</b></i>	Northfield Mount Hermon School 206 Main Street
<i><b>City/Town</b></i>	Northfield
<i><b>PWS ID Number</b></i>	1217001
<i><b>Local Contact</b></i>	George Santucci
<i><b>Phone Number</b></i>	413-498-3455

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices



## Section 1: Description of the Water System

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.

<i>Source Name</i>	<i>Source ID</i>	<i>Susceptibility</i>
Grandin Reservoir	1217001-01S	Moderate

The East Northfield Water Company maintains and operates the Grandin Reservoir, serving a portion of the Northfield Mount Hermon School and several private residences in the vicinity of the school. Northfield is a small, predominantly rural, residential community in western Massachusetts along the Vermont border. The Grandin Reservoir is approximately 7.1 acres in size (surface area) with an estimated safe yield of approximately 0.2 million gallons per day (MGD). The reservoir and approximately 95% of the watershed is

owned by the Northfield Mount Hermon School, which leases the property to the East Northfield Water Company. The entire property is designated in the Northfield Mount Hermon operating plan as water supply protection area. The East Northfield Water Company has prepared and is implementing a watershed protection plan to manage the watershed. Water from the reservoir is chlorinated for disinfection prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

The watershed is located in a forested upland area of moderate to steep terrain with shallow bedrock primarily covered by thin till. The USGS mapped the bedrock geology of the Grandin Reservoir and its watershed area as an area of amphibolite lens within in the Monson gneiss, a light-gray, medium-grained gneiss, with quartz, and biotite.

## Section 2: Land Uses in the Protection Areas

The watershed for the Grandin Reservoir is 98% forested land. Over 95% of the land is owned by Northfield Mount Hermon School, which holds a 99-year lease with the East Northfield Water Company. Surface water supplies by their nature are highly vulnerable to potential contamination. The East Northfield Water Company

Reservoir has a MA DEP approved watershed protection plan, prohibits vehicular traffic to the watershed, actively conducts drinking water supply education, watershed management, and regularly inspects the watershed to maintain a waiver from filtration. There are few anthropomorphic threats within the watershed. Land uses and activities that are potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include

1. Access road
2. Potential for presence of aquatic mammals
3. Forest operations

The overall ranking of susceptibility to contamination for the system is moderate. Although the potential sources of contamination are ranked low, the vulnerability of the surface water supply increases its potential susceptibility. Please refer to Table 2 for the summary of potential sources of contamination.

**1. Access Road** -- The gravel access road through the watershed crosses one tributary stream and follows along the major tributary to the reservoir. At the time of the assessment, active logging was being conducted and erosion along the road was evident although actively being managed. During and following the completion of the logging activities the road was graded to prevent direct

### Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

runoff to the reservoir. In addition, the bridge across the tributary was significantly deteriorated and was reinforced to allow access with the logging equipment.

#### Access Road Recommendations:

- ✓ Continue to inspect and maintain the road to manage erosion and runoff; re-grade the road as necessary.
- ✓ Continue pursuing alternatives to repair or replace the bridge to maintain access and prevent the bridge from collapsing into the tributary.

**2. Potential for Impact from Wildlife and Aquatic Mammals** – As a surface water supply, there is potential for aquatic mammals (beavers and muskrats) to live in and near the surface water supplies. Aquatic mammals pose a potential threat of microbial contamination of the source from *Giardia* *Lambia* and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water. There is no evidence of current aquatic mammal populations in the watershed. The steep topography of the watershed may provide limited habitat for aquatic mammals.

#### Wildlife Recommendations:

- ✓ Continue to monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake.
- ✓ Monitor raw water quality and assess potential impacts.

**3. Forest Operations** – Approximately 98% of the watershed consists of densely forested areas. Much of the watershed, including portions of Zone A, were part of a recently completed cutting plan. Every 10-30 years, a forest harvest project is performed in the watershed. No new cutting is scheduled at this time. Forestry operations can allow for runoff-induced erosion of soils, which can create a problem with turbidity and increased particulates in the water. There was no evidence of water quality impacts from the logging operations noted during the assessment.

#### Forest Operation Recommendations:

- ✓ Continue current strict adherence to a forest management and cutting plans.
  - ✓ Maintain current diligence and effort to prevent runoff of roads and cut areas.
- 
- ✓ Update watershed management plan and forest management plans as appropriate and necessary.

Additional land uses identified in the watershed are high voltage lines located in the southeast corner of the Zone C, operated by Western Massachusetts Electric. Contact the utility and supply them with a current map of the watershed to ensure the accuracy of the information the utility utilizes to prepare their management plan for the Right-of-way within the water supply watershed.

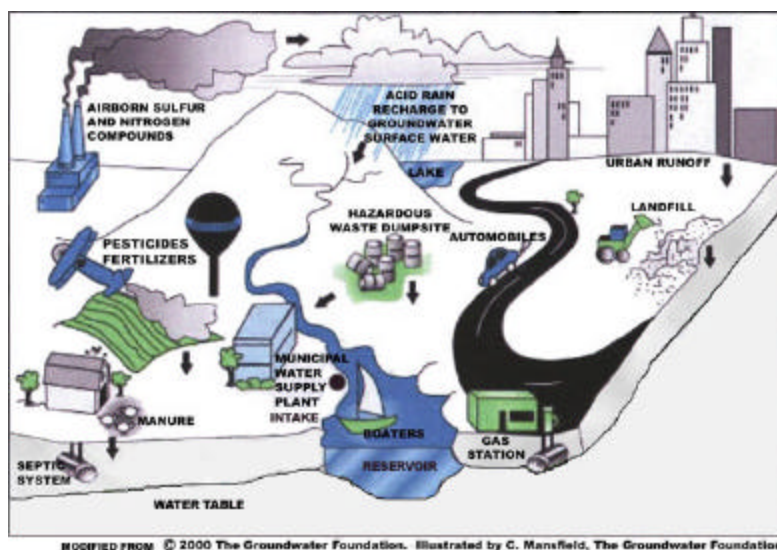
Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

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- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Figure 1: Sample watershed with examples of potential sources of contamination

land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the protection areas contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The East Northfield Water Company watershed contains few threats due to forethought in development of the source and purchase of nearly the entire watershed. The supplier is commended for their continued proactive water supply protection through:

- Preparing and actively pursuing a drinking water supply, watershed management plan,
- Actively controlling access and,
- Endorsing public education about the water supply.

#### Additional Source Protection Recommendations:

To maintain protection of the source for the future:

- ✓ Continue regular watershed inspections.
- ✓ Continue to assist in educating residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the watershed boundaries and to cooperate on responding to spills or accidents.
- ✓ In addition to the designation of the watershed in the school operational plan, consider obtaining a conservation restriction on the watershed parcels' deed to ensure protect the source beyond the 99-year lease.
- ✓ Maintain communication with Western Massachusetts Electric to protect your watershed. Provide them with current maps to keep them informed of

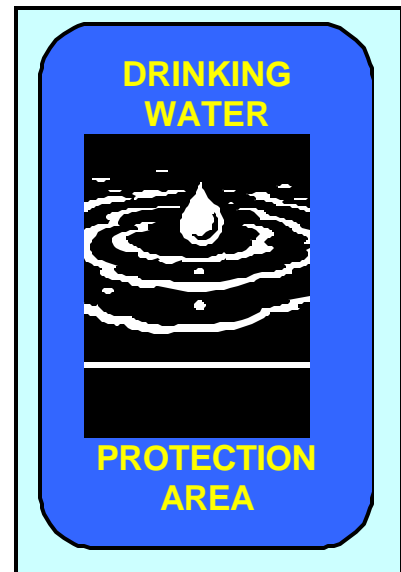
the Right-of-Way areas within the Zone C.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

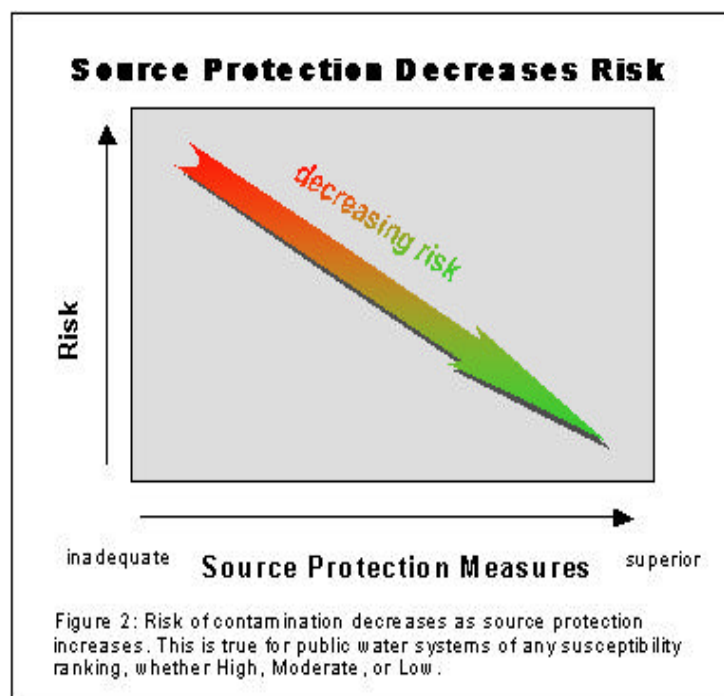
DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Forestry Operation	54 acres	L	Equipment maintenance materials: leaks, spills, or improper handling; road building, erosion (Approximately 10-year cutting cycle recently completed)
<b>Miscellaneous</b>			
Aquatic Wildlife	Potential	L	Microbial contaminants
Transmission Line Rights-of-Way Type: <u>Electric (High Voltage Lines)</u>	1.3 acres	L	Corridor maintenance pesticides: over-application or improper handling; construction. Request manual cutting only.
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## Section 4: Appendices

- A. Protection Recommendations
- B. Additional Documents on Source Protection

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring activities in Zone A.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>N/A</b>	East Northfield Water Company has controls through ownership
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>N/A</b>	East Northfield Water Company has controls through ownership
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>YES</b>	Maintain and follow the surface water supply protection plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	<b>N/A</b>	
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide watershed protection education?	<b>YES</b>	Continue educational efforts through the school.





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Pioneer Valley Regional School District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
December 4, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Pioneer Valley Regional School District</b>
<i>PWS Address</i>	<b>97 F S Turner Road</b>
<i>City/Town</i>	<b>Northfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1217002</b>
<i>Local Contact</i>	<b>Mr. Stephen Field</b>
<i>Phone Number</i>	<b>413-498-2931</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1217002-01G	279	744	Moderate/High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Pioneer Valley Regional School (the school) is located in the west central section of Northfield. Northfield is a small rural town in northwestern Massachusetts along the Vermont and New Hampshire border. The facility consists of two major school wings located adjacent to each other serving seventh through twelfth grade; the wings are attached to each other. The total school student and staff population is approximately 625 people per day. Although there are two municipal water systems and a wastewater treatment facility in Northfield, they do not serve the area where the school is located.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Therefore, the school and surrounding facilities are served by on-site water supplies and septic disposal.

The school is served by one potable supply well (Well #1 – 01G), 6-inch diameter, 350-feet deep, bedrock well that is located approximately 700 feet west of the school. The original shallow gravel developed wells for the school are located approximately 300 feet west of the currently active well. The gravel wells were abandoned as potable supplies in 1986 when Well #1 was installed under the DEP New Source Approval Process. The original gravel wells were not physically decommissioned and remain intact. The motor control building also still exists, however, during the recent renovation and school expansion project, the motor controls for the well were relocated from the old building into the school. In the most recent Sanitary Survey of the system conducted in August 2003, the DEP also recommended that capital planning include funds for decommissioning the original wells because the wells are adjacent to a wetland that is subject to flooding.

The school is located on the western edge of the Connecticut River valley at the base of the Berkshire foothills. Geologic mapping indicates overburden deposits of approximately 50 feet of sand and gravel with some amount of till over bedrock at the school. The school is located immediately west of an area mapped as potential, medium yield, sand and gravel aquifer. This valley area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 18,000 years ago. The bedrock in the immediate area of Well #1 is mapped as feldsicc gneiss of the Partridge Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	-	-	-	UST w/leak detection at school just outside of the IWPA
Floor Drains in Boiler Rooms to septic	No	Yes	Moderate	Presently working with DEP UIC and wastewater programs regarding compliance
Agriculture/Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields. Refer farmers to DAR and NRCS regarding IPM
School (Middle and High Schools)	No	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel
Septic systems components	No	Yes	Moderate	Residential and part of the school's wastewater components are in the IWPA; the school leachfield is not in the IWPA
Hazardous materials	No	Yes	Moderate/High	Maintenance hazardous materials and laboratory waste
Transformers	No	Both	Low	Monitor transformers for potential leaks
Aquatic wildlife (beavers)	Yes	Yes	Moderate/High	Protect the wells from being inundated

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 279 feet and an IWPA protective radius of 744 feet. These protective radii were approved at the time the well was installed based on the capacity of the well and Zone I ownership restrictions. Please refer to the attached map that shows the Zone I and IWPA.

There is no evidence of a continuous, protective confining layer such in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. Although there have been periodic detections of dichloromethane and chloromethane in the water, the concentrations have never exceeded any regulatory thresholds. The source of these constituents is not known. Therefore, the water is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tanks (outside of protection area);**
3. **Floor drains in boiler rooms;**
4. **School facilities and athletic fields;**
5. **Transportation corridors/parking; and**
6. **Hazardous materials.**

There are several activities within the Zone I and IWPA that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate/high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier does not own or control the entire Zone I area for the well, however, the only activities in the Zone I are passive recreation and a periodic beaver population in the nearby wetland. Systems not meeting DEP Zone I requirements for ownership or control or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides or fertilizers in Zone I.

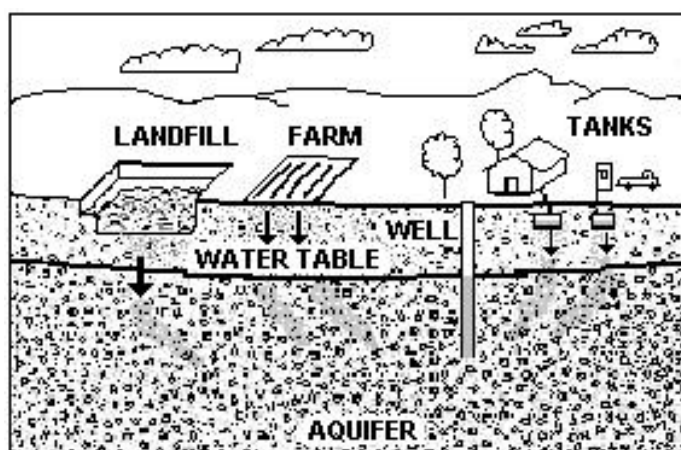


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

- ✓ Control beaver activity near the well to protect it from inundation.
- ✓ Inspect the well regularly to ensure the cap is secure and there is no standing water near the well.

**2. Underground fuel oil storage** – There is a fuel oil UST just outside of the IWPA. Since the actual recharge area of the well has not been delineated, this report includes activities that may pose a threat even though they are just outside of the protection areas. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store.

#### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil, especially delivery.
- ✓ Have spill containment/absorbent materials available on-site

**3. Floor Drains in Boiler Room** – There are floor drains in the boiler room, that discharge to the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. The school is presently required to address the floor drain by the DEP and is working with the Department to resolve the issue.

#### Recommendations:

- ✓ Continue to work with the Department UIC and wastewater program staff.
- ✓ Consider containment to prevent accidental releases to the floor drain. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal any cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**4. School facilities and athletic fields** – Elementary and middle schools generally use only household type hazardous materials. However, high school laboratory and photo labs can use potentially harmful materials and the school does not have a tight tank for the laboratory waste. Title 5 prohibits the disposal of any wastewater other than sanitary waste to the septic system. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers or pesticides, which can be of concern. Storm drains in the parking areas at the school drain directly into the ground. The high school does use micro-pipeting techniques to minimize laboratory waste.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides or fertilizers within Zone I.

- V Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V For additional information, refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**5. Transportation corridor/parking** – The school’s internal transportation corridors and parking are located within the IWPA. A railroad line is also located on the extreme edge of the IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.

**6. Hazardous Materials Storage and Use** – The school utilizes hazardous materials for maintenance and in the laboratories. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator. The school does have a tight tank for the laboratory wastes.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- V Maintain the tight tanks as appropriate.

### **3. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I. The school district should comment to the various town boards regarding developments that may impact the school’s well.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- V Communication with the Town boards and emergency responders regarding the location of the well and the protection areas.

**Zone I and IWPA:**

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lab chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, lab chemicals, pesticides and household hazardous waste.

**Training and Education:**

- V Incorporate groundwater education into school curriculum (7-12 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.



**Facilities Management:**

- V Staff should be instructed on the proper disposal of spent household chemicals and or lab chemicals. Include custodial staff, groundskeepers, and the certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.
- V Continue to work with the Department regarding compliance of the floor drains in the boiler room.

**Planning:**

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- Very Small Quantity Generator (VSQG) information



# Source Water Assessment Program (SWAP) Report For Northfield Mountain Station and Visitor's Center



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 27, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	<b>Northfield Mountain Station &amp; Visitors Center</b>
<i>PWS Address</i>	<b>99 Millers Falls Road</b>
<i>City/Town</i>	<b>Northfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1217003</b>
<i>Local Contact</i>	<b>Mr. Robert Perry</b>
<i>Phone Number</i>	<b>413-659-4468</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well A	01G	100	420	Moderate
Well B	02G	191	490	Low

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

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## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

Northfield Mountain Station & Visitor's Center is a pumped storage, hydroelectric generating station and outdoor recreation facility owned by Northeast Generation Company and operated by Northeast Generation Services Company. The power generating facility is located approximately eight hundred feet below ground and was constructed in the 1960's. The station generally pumps water from the Connecticut River to a storage reservoir at night, releasing the water during the day to generate power during high demand periods. The recreational facility includes a Visitor's Center that offers educational displays, coordinates tours and maintains picnic areas and trails for hiking, mountain biking and cross-country skiing.

The facility maintains two public water supply wells, Well A (01G - the back-up well) and Well B (02G - the main well). Well A has an 8-inch casing set within a 14-inch

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are may not be identified in this report.

casing located in an underground vault approximately 200 feet from the Visitor's Center. Well A is utilized only under high water demand conditions to maintain pressure in the storage tank. Well B is the main supply well and is located approximately 500 feet from the transmission switchyard and provides 85% to 95% of the total annual system demand. Well B has an 8-inch casing terminating 16-inches above the ground. The depth and construction details of the wells are not known, however, pump information indicates Well A is greater than 193 feet in depth. Based on that information and the location of Well B, on the side of a hill, both wells are assumed to extend into bedrock. The bedrock geology map shows the Poplar Mountain Formation gneiss underlies the area. The gneiss is a medium to fine-grained, gray to greenish gray foliated, micaceous gneiss.

Well A is approximately 110 feet from the rotary in the Visitor's Center parking area. Only passive recreational activities occur within the Zone I of Well A. Within the IWPA of Well A are the access road, parking, sewer lines and a septic tank. There are no fertilizers or pesticides utilized on the lawns at the facility. Well B is located south of the substation switchyard facility at a slightly lower elevation; a small drainage feature (swale) lies between the well and the switchyard. Well B is located on a natural bedrock feature while the switchyard is located upon an artificial highland constructed from rubble excavated during construction of the hydroelectric generating facility. There is passive recreation and a high-tension transmission main within the Zone I and IWPA of Well B. However, the IWPA for Well B terminates at the edge of the switchyard. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Therefore due to the proximity of the switchyard to the well, activities in the switchyard were also reviewed.

As noted above, both wells are located in a bedrock aquifer. Bedrock aquifers are considered to have a high vulnerability to potential contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Table 2 - Table of Land Uses Specific to Each Protection Area describes the activities identified during the assessment. Please refer to this table and the attached map of the Zone Is and IWPAs for more information.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### The Water Quality

At this time, water from both wells does not require and is not treated. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1.

**Table 2: Table of Activities Specific to Each Protection Area**

#### Water Supply Protection Area for Well A

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Visitor's Center	Sewer lines and septic components	No	Yes	Moderate	Sewer lines and septic tank in IWPA. See septic systems brochure in the appendix. Continue annual tank pumping.
	Access road and parking	No	Yes	Moderate	Continue minimal salt use and monitor area.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Water Supply Protection Area for Well B

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Power Station	Power Transmission Lines	Yes	Yes	Low	Use only mechanical clearing or chemicals approved for IWPA's.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a very few land uses and activities within the drinking water supply protection areas for Northfield Mountain & Visitor's Center wells that are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is moderate for Well A and low for Well B based on the presence of at least one moderate threat land use or activity in the IWPA for Well A, as seen in Table 2.

Key Land Use Issues for the Wells include:

1. **Ownership of Zone I, Well B**
2. **Access Road and Parking**
3. **Power Transmission Lines**

1. **Ownership of Zone I** – Although the Zone I is primarily forested with passive recreational activity and the transmission main through the area, Northeast Gen. Co. does not own the entire Zone I.

- **Recommendation** – Investigate the potential for additional land purchase, entering into a Conservation Restriction or an agreement for Right of First Refusal upon sale of the land.

2. **Access Road and Parking** - The parking along the access road at the Visitor's Center within the IWPA of Well A constitutes a moderate threat due to the potential for accidental release of petroleum products. The parking in the rear of the facility has storm drains that discharge outside of the IWPA, away from the well, and is not included in the assessment.

- **Recommendation** – Monitor vehicle parking area along the Visitor's Center access road and discourage parking in the turnaround proximal to the Zone I at Well A.

3. **Power Transmission Mains** – Vegetation control and maintenance activities pose a low threat to Well B.

- **Recommendation** – Continue use of only mechanical methods or approved chemicals for vegetation control in IWPA and use caution when utilizing vehicles along transmission main.

In addition to being a public water system, Northeast Generation Company is registered with the MA DEP or EPA for the following: small quantity generator of waste oil/PCBs, very small generator of hazardous waste (other than oil), and minor surface water discharge. The surface water discharge is located well outside of the IWPA however, storage of petroleum products and hazardous waste generation are conducted within the switchyard. As previously noted, although the switchyard and its associated buildings are located outside of the IWPA for Well B, all activities were reviewed due to the close proximity of the IWPA. Petroleum products and hazardous materials stored near or proximal to the IWPA pose a potential threat of a release of large

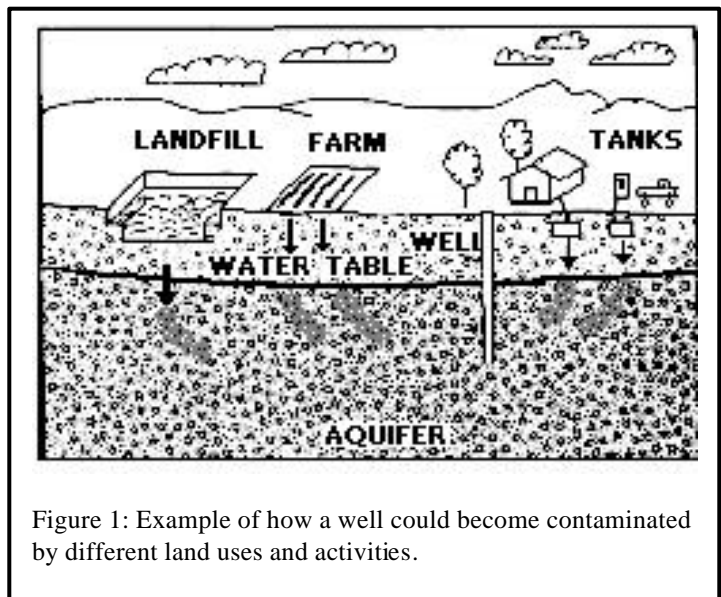


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

quantities of fuel and other materials. Proper handling and containment minimizes the potential threat from these products.

The hazardous waste observed during the site visit was labeled and within secondary containment. One Aboveground Storage Tank (AST) for diesel fuel is located immediately adjacent to the IWPA and within a secondary containment structure. There is a 2,000-gallon diesel Underground Storage Tank (UST) for the emergency generator. The tank is a cathodically protected steel, double-walled tank with leak detection and overfill protection. During the assessment, several areas with floor drains were observed that were not connected to a tight tank or sewer. One area, the maintenance garage, contains hazardous materials. Following the site visit, the floor drains were investigated, assessed and have all been sealed in accordance with the MA DEP policy and regulations.

It should also be noted that the attached map inaccurately shows an underground storage tank near the access road to the Visitor's Center. Some time ago there was a garage with a UST in that vicinity. However, the garage and UST were dismantled and removed in 1983.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

Northfield Mountain Station and Visitor's Center has fairly well protected wells. The MA DEP encourages limiting the activities near the wells and continued diligence in updating your protection measures. Northeast Generation Co. should review and adopt the following recommendations at the facilities:

### Zone I:

- Keep non-water supply activities out of the Zone I.
- Erect water supply protection signs along the perimeter of the protection areas
- Consider additional land purchase, Conservation Restriction or Right of First refusal agreement for Zone I for Well B.
- Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- Direct road and parking lot drainage away from well, as feasible.
- Continue the current practice of not using pesticides, fertilizers or road salt within the Zone I.

### Facilities Management:

- Continue standard operating procedures regarding proper storage, use and disposal of hazardous materials and emergency response.
- Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- Continue use of Best Management Practices (BMPs) for hazardous materials.
- Continue current practice of annual septic system inspection and maintenance. Refer to the appendices for more information regarding septic systems.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier and town boards and will be made available on the DEP's web site.

### **Planning:**

- Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws.
- Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. ATTACHMENTS**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Linden Hill School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 18, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Linden Hill School
<i>PWS Address</i>	154 South Mountain Road
<i>City/Town</i>	Northfield, Massachusetts
<i>PWS ID Number</i>	1217006
<i>Local Contact</i>	Mr. John Sullivan
<i>Phone Number</i>	413-238-5344

<i>Source Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #4	1217006-04G	250	622	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Linden Hill School is located on South Mountain Road in the town of Northfield in northwestern Massachusetts on the Vermont and New Hampshire border. The facility is a residential school for boys, ages 9 to 15 with special educational needs; the summer program includes boys and girls ages 7 to 16. Northfield is a small rural residential community that has public water and sewer, however those services are not available in the area where the school is located. The facility is therefore served by a single on-site water supply well and wastewater is discharge to a common septic system.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The school population fluctuates but has the capacity for approximately 100 staff and students. The school grounds include approximately six buildings including a gymnasium, dorms and classrooms. The school recently added a new dormitory.

Water is supplied by a single source, Well #4 that is located on the side of the hill east of the Headmaster's house. Well #4 was approved in November 2003 to replace Wells #1, #2 and #3 which are non-conforming with respect to DEP Zone I restrictions and are located in the center of the campus adjacent to buildings. Wells #1, #2 and #3 have currently been designated as emergency sources and will not be further addressed in this report. Well #4 is a 6-inch diameter, 520 feet deep well drilled into the bedrock aquifer. The well has 50 feet of casing grouted 31 feet into the rock.

The Zone I is the area immediately around the wellhead while the Interim Wellhead Protection Area (IWPA) is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be smaller or much larger than the IWPA. The Zone I and IWPA radii for Well #4 are 250 feet and 622 feet, respectively, based on a withdrawal rate approved as a result of the New Source Approval Process. Please refer to the attached map that shows the Zone I and IWPA radii.

The complex is located in an area where the geologic mapping indicates thin till overburden covering the bedrock. The well logs confirm approximately 19 feet of overburden at the well site. The bedrock at the site is mapped as gneiss associated with the Bronson Hill Zone. There is no evidence of an extensive protective till or clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The facility's well water is not treated. Public water suppliers are required to monitor water quality at the facility. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridors/parking	No	Yes	Moderate	Manage stormwater and limit road salt usage.
Above ground storage tank (fuel oil)	No	Yes	Moderate	Use BMPs for fuel oil storage and delivery
High density/low density residential	No	Yes	Moderate	Provide BMPs for household hazardous waste management. Use IPM for lawn maintenance.
Septic system components	No	Yes	Moderate	Leachfield is located outside of the protection areas. Some components are within the Zone I and IWPA.
School	No	Yes	Moderate	Use BMPs for household hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Institution use (residential school);**
2. **Transportation corridors/parking.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land use or activity in the IWPA, as seen in Table 2. However, the well is located topographically upgradient of the school and the well is fairly remote from activities at the school. A few moderate threat activities are located on the downgradient portion of the IWPA. The system is in compliance with the Zone I restrictions that allow only water supply related or non-threatening activities in the Zone I for the Well 04G.

**1. Institutional use** – The school consists of land uses that are common to residential uses. The facility utilizes a single on-site septic disposal system; the leachfield is outside of the IWPA although some components are within the IWPA. One private home is located within the IWPA. The school utilizes fuel oil for heating and the storage tanks are located in the buildings. Only the headmaster's house is within the IWPA. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. The septic system is predominantly outside of the protection areas although some components are within the downgradient edge of the IPWA. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their piping can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent

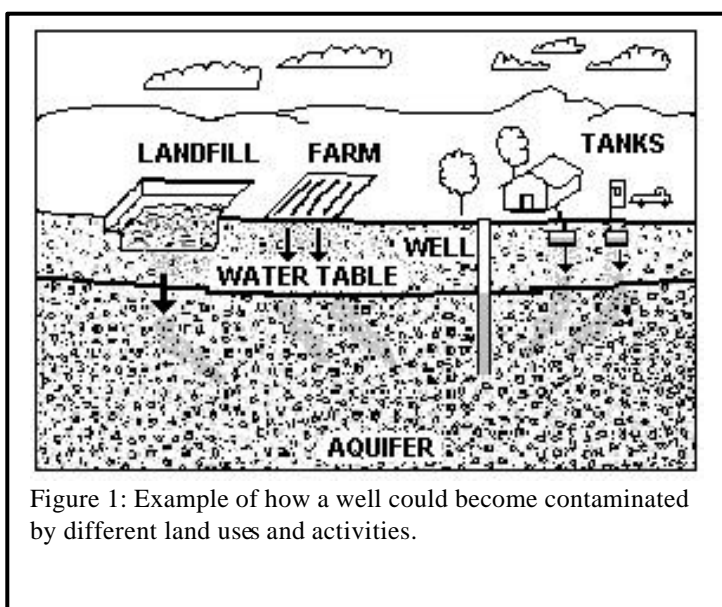


Figure 1: Example of how a well could become contaminated by different land uses and activities.

properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" attached to this report and at the DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls. Provide containment for the tanks and sleeve the fuel lines.
- ✓ The facility utilizes fuel oil for a heating source. Containment of the fuel system to prevent accidental releases to the basements and ground should be reviewed in the buildings. Fuel tanks should be within containment

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

to protect floor drains, cracked floors or walls that could act as conduits if fuel oil leaks or is spilled from the storage tanks. Contact the regional DEP staff from the UIC program (Tony Zaharias 413-755-2122 or Rick Larson 413-2207) for advice regarding protecting tanks. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require your boiler maintenance contractor use containment, protect any drains and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- ✓ Seal all cracks in the floor and any floor drains if they cannot be adequately protected to prevent a prohibited discharge.

**2. Transportation corridor/parking** – The school's internal corridors and South Mountain Road are within the IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

#### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well and the protection areas.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Linden Hill is commended for replacement of the threatened wells. Review and adopt the key recommendations above and the following:

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.

#### Facilities Management:

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Continue to educate the staff and control the use of household hazardous materials

in the Zone I.

- ✓ Continue to minimize the use of fertilizers and pesticides on campus.
- ✓ Monitor fuel oil delivery and use to prevent releases.

#### Planning:

- ✓ Work with your community to include your IWPA in the District along with other public water supplies in town.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Continue long term planning for the system that includes maintenance of the water and wastewater systems.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Orange Water Department**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Orange Water Department
<i>PWS Address</i>	16 West Myrtle Street, P.O. Box 267
<i>City/Town</i>	Orange
<i>PWS ID Number</i>	1223000
<i>Local Contact</i>	Richard P. Kilhart
<i>Phone Number</i>	(978) 544-1115

### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

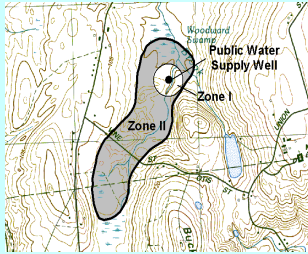
1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices



## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

### System Susceptibility

### High

#### Zone II #: 234

**Susceptibility:** High

Well Names	Source IDs
Well #1	1223000-01G
Well #2	1223000-02G

#### Zone II # 233

**Susceptibility:** High

Well Names	Source IDs
Well #3	1223000-04G

The town of Orange is a medium sized community in north west-central, Massachusetts. Orange, settled in the 1700's, was established as a town in the early 1800's, and initially developed as an industrial community along the Millers River. The Orange Water Department maintains three active water supply wells Well #1 (01G), Well #2 (02G) and Well #3 (04G). The Department also lists three surface water supplies: Lake Mattawa, Crystal Spring and Coolage Brook Reservoirs as emergency sources of water. The emergency sources will not be addressed further in this report.

Wells #1 and #2 are located approximately 4,000 feet apart, within the same, relatively narrow, unconfined, sand and gravel aquifer that lies between Lake Mattawa and the Millers River along the North Pond Brook valley. Well #1 is rarely used and is a 10-inch diameter well, 54 feet deep installed in the 1940s. Well #2 is used as the main supply, in conjunction with Well #3, and is an 18-inch diameter, gravel developed well, approximately 85 feet deep. Wells #1 and #2 are located within the same hydrogeologic regime, and share the same Zone II contribution area. However, Well #2 is located downgradient of Well #1 and is proximal to (within 850 feet of) the Millers River. The Zone II (#234) is entirely within Orange. Well #3 (04G) is located in the southeast section of the town within a separate, semi-confined, (leaky-confined) sand and gravel aquifer and has a different Zone II contribution area. Well #3 is a 24 x 32-inch diameter gravel packed well that was installed in the 1990s. The majority of the Zone II #233 is in Orange with approximately 25% of the area within New Salem.

Both aquifers are glacially deepened, bedrock valleys that were filled in with sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 years ago. Streams and rivers have reworked and eroded the glacial deposits and recent streams have deposited additional alluvial material. Boring logs and maps in the North Pond Brook valley indicate medium to coarse sand and gravel deposits up to 85 feet in depth. Although some boring logs indicate silt and clay, there is no evidence of a continuous confining clay layer in the North Pond Brook aquifer in the vicinity of Wells #1 and #2. Due to the proximity of Well #2 to the Millers River (approximately 850 feet), under extreme drought and extended duration pumping conditions, according to the Zone II analysis report, the Millers River could contribute water to the aquifer supplying Well #2. Well #1 is immediately north of Crystal Spring an emergency, surface water source for Orange. Well #3 is located on the western edge of the aquifer, that flows primarily east, northeast toward Lake Rohunta



and ultimately to the Millers River. It appears that Well #3 lies near a surface water drainage divide between Cold Brook and Shingle Swamp Brook. Well log data indicates a confining clay unit in the immediate vicinity of well #3, however, the confining unit pinches out to the east and north. Therefore the aquifer responds as a confined aquifer initially, but over time, the area of contribution, expands to the unconfined portion of the recharge area. The clay layer was deposited during the glacial recession when a dam was formed blocking the melt water flow and causing the formation of a temporary lake; the clay layer represents the lake bottom sediments. Eventually the dam was breeched and the lake drained. The effect of this hydrogeologic regime is that although the aquifer may be protected from some land uses immediately adjacent to the confining clay layer, the aquifer is vulnerable to contamination from activities conducted in the unconfined portions of the recharge area. The extent and protectiveness of the confining layer is not known with certainty.

The bedrock in the area is a complex series of folded and faulted metamorphic rocks. In the vicinity of Zone II for Wells #1 and #2, the bedrock is mapped as bands of the Littleton Formation, a mica and quartzose schist and aluminous phyllite, the Partridge Formation, a mica biotite schist, and the Clough Quartzite. The bedrock within the Zone II of Well #3 is the Monson Gneiss, a massive, layered biotite, plagioclase gneiss.

Each well has a Zone I protective radius of 400 feet immediately around the wellhead. The Zone IIs were delineated by consultants for the Water Department utilizing geologic mapping, and analytical and/or numerical modeling. Data for the analysis was gathered from extended duration pumping tests and boring logs. Both aquifers, the North Pond Brook aquifer and the Cold Brook/ Shingle Swamp aquifer are considered to be highly vulnerable to contamination due to the absence or discontinuous nature of the hydrogeologic barriers (i.e. clay) that can prevent contaminant migration from activities on the land surface. In fact, low levels of volatile organic compounds (VOCs) have been reported in the water from Well #3. VOCs

were reported in water from Well #1 during one sample round in 1990 but were not detected subsequently. The concentrations reported in Well #3 are below the action levels and therefore treatment is not required at this time. Please refer to the attached map to view the boundaries of the Zone II and consult the Consumer Confidence report for current water quality data.

Potassium hydroxide is added to the water from all wells to raise the pH for corrosion control. For current information on water quality monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

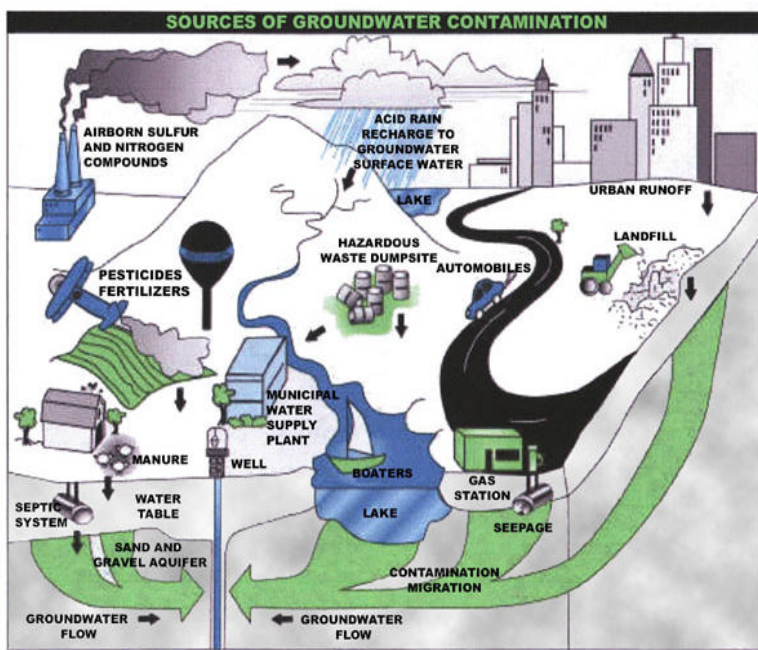
## Section 2: Land Uses in the Protection Areas

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



The land use within the Zone IIs for the Orange Water Department wells is a mixture of forest, cropland, and residential, with a small portion of commercial/light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

**Key Land Uses and Protection Issues include:**

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Agricultural activities
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of one high threat land use within the water supply protection areas of Well #3, as seen in Table 2.

**1. Non-conforming Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Currently, Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction, Memorandum of Understanding or other legal mechanism as approved by the DEP. The public water supplier does not own or control the entire Zone I for any of the wells. Only activities directly related to the water supply, or other no-threatening activities, as determined by the DEP, are allowed in the Zone I. Route 2 and other transportation corridors, and a portion of a farm are within the Zone Is. Well #2 is the most remote from non-conforming activities within the Zone I. Numerous water sources were developed prior to the 400-foot Zone I requirement and are therefore grandfathered. The Department encourages grandfathered systems to acquire ownership or control of the Zone I. The Orange Water Department has actively pursued methods of protecting and/or acquiring the Zone I land.

**Zone I Recommendations:**

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Continue your current efforts to purchase land and/or negotiate a conservation restriction for land within the Zone I.
- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
  - A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system

(Continued on page 6)

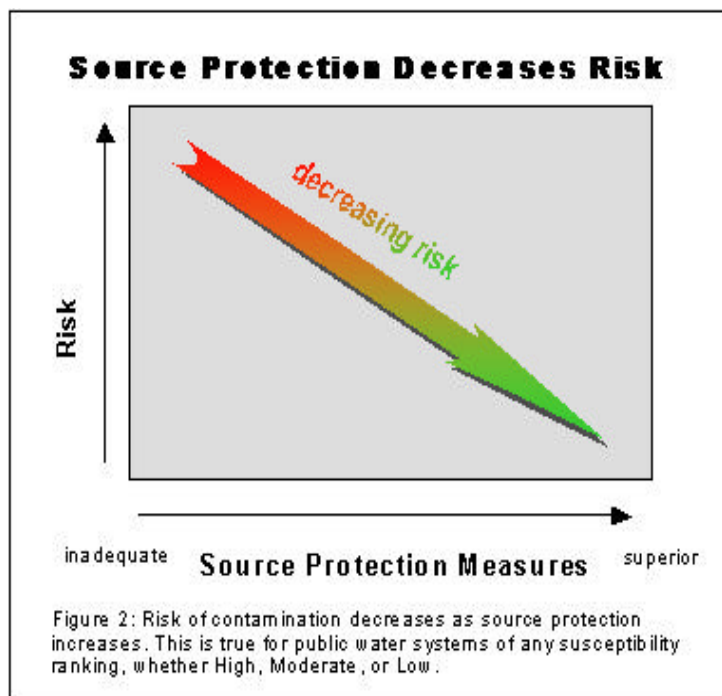
**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**For More Information**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
<b>Agriculture</b>				
Dairy Farms	1	M	233	Manure (microbial contaminants): improper handling
Fertilizer/Pesticide Storage or Use—Crops	2	H	Both	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	233	Manure (microbial contaminants): improper handling
Nurseries	2	M	233	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aboveground Storage Tanks	1	M	Both	Materials stored in tanks: spills, leaks, or improper handling
Stormwater Drains/ Retention Basins	1	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Railroad Right-of-Way	1	M	234	Very small area within Zone II. Corridor maintenance and accidental spills in Zone III.
Sand and Gravel Mining/ Washing	1	M	234	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Golf Courses/Driving Range	2	M	233	Fertilizers or pesticides: over-application or improper handling. Hazardous materials handling
Medical facility	1	M	234	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
<b>Miscellaneous</b>				
Transportation Corridors	Several	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	1	H	Zone III of #234	Stored materials: spills, leaks, or improper handling
Transformers	Several	L	Both	MODF and possibly PCBs: spills, leaks, or improper handling. Contact the electric company to ensure no PCBs are within the transformers.

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of fields within the Zone I would not have manure, fertilizers or pesticides spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

- A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.

The Department commends the Orange Water Department for its proactive efforts to acquire property and recommends continued efforts in establishing a program for planning to acquire ownership or control of property within the areas critical to protecting water quality. If there is no other reasonable method to secure rights and protect these sources, the Department may consider taking necessary water supply land by eminent domain to protect the sources. This recommendation is not only for the existing sources but also should be considered for future development of sources if they are needed.

**2. Residential Land Uses** – Approximately 16% and 4% of the Zone IIs for Wells #1 and 2 and Well #3 respectively, consist of residential areas. The Zone II areas are not connected to municipal sewer and therefore utilize on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not

properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

**3. Transportation Corridors** - State highways (Rt. 2, 202 and 122) and local roads run throughout the Zone II protection areas. Roadway construction, stormwater runoff, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are also frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins. The stormwater drainage along Rt. 2 within the Zone II #234 is anticipated to be addressed during the Rt. 2 reconstruction.

The Water Department coordinates with the Fire Department to plan and train for emergency response actions related to releases that may impact the water supplies. This planning is especially effective because of the highways and the proximity of the Orange Airport. Although the airport is not within the Zone II, it is within close proximity to the recharge areas.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. This information could be very important in the event of an accident and release of hazardous materials that could wash into stormwater drains.
- ✓ Contact the Town and State to ensure catch basins are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.

#### **Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ Continue current efforts of working and planning with local emergency response teams to ensure that any spills within the Zone II can be effectively contained and the water Department is notified.

**4. Agricultural Activities** – There are several farms (dairy, crop, and nurseries) and agricultural activities (haying and non-commercial animals) throughout both Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water supplies. In addition, farms and large commercial facilities often conduct their own maintenance on their equipment and have storage of hazardous materials and waste.

#### **Agricultural Activities Recommendation:**

- ✓ If appropriate, work with the DEP to negotiate Conservation Restrictions for these land areas.
  - ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online and call the local office of the NRCS in Hadley at 413-585-1000 for assistance or online at <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers and property managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
  - ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning. Request that farms, golf courses and other large commercial facilities evaluate their status as hazardous waste generators and register as appropriate.
  - ✓ Continue your current work with farmers, and include nurseries and the golf course to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
  - ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>, and call the local office of the NRCS for assistance. This is also appropriate for New Salem.
  - ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**5. Protection Planning** – Currently, the Town of Orange has water supply protection controls that do meet the requirements of the Department's Wellhead Protection regulation 310 CMR 22.21(2). However, the Town of New Salem does not have regulations for the protection area for Well #3. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan can coordinate community and inter-community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

It should also be noted that activities within the Zone III may pose a potential threat to the water supply. Specifically, under rare conditions when the river may contribute water to the aquifer an accidental release to the river may pose a threat to water quality at Well #2. This report does not include facilities located along the Millers River or in the Zone III of the wells. Land uses that should be considered in protection and emergency response planning are the WWTP, auto repair facilities, USTs, and railroad tracks. Railroad tracks run through a very small portion of the Zone II # 233



and along the river. Rail corridors serving passenger or freight trains can be potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals. In the event of a release to the river, the railroad company should notify the Water Department. As noted previously, under extreme drought conditions, there is a potential for the river to contribute water to the aquifer near well #2. It should be noted that Utility Yearly Operating Plans (YOPs) do take into consideration sensitive environments when conducting vegetation control and track maintenance.

**Protection Planning Recommendations:**

- ✓ Consider inventorying facilities upstream along the Millers River and incorporate any potentially high threat facilities into your Emergency Response Action Plan such as the wastewater treatment plant and other facilities that may be just outside of the Zone II or within the Zone III.
- ✓ Consider preparing a Wellhead Protection Plan. Establish a protection team that includes participants from the Town of New Salem, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Request that the New Salem Board of Health adopt floor drain controls and hazardous materials handling regulations and that the Planning Board propose wellhead protection bylaws for the Zone II.
- ✓ Request that the Board of Health review the maps used by the railroad in their YOP for accuracy. This should only have to be done one time.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Proactively pursuing land acquisition and protection options in the Zone I and II,
- Maintaining detailed knowledge of activities within the protection areas,
- Establishing and maintaining a working relationship with the emergency responders in town to develop response actions to various emergencies,
- Operating an award winning water department.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Consider inventorying USTs within the Zone IIs.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan and continue efforts to include New Salem in source protection efforts.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Each spring, if funds are available, DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection area. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction and other forms of protection.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue to keep other land uses out of the Zone Is. Continue working with land owners to negotiate a CR, MOU and other forms of protection.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>YES</b>	Modify protection measures as appropriate if regulations are modified for additional protection.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	New Salem does not have wellhead protection measures in place that meet 310 CMR 22.21(2). Continue efforts to encourage New Salem to adopt bylaws and regulations to protect resources.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	However, Orange is proactive with respect to wellhead protection. Consider formalizing current and past protection efforts into a plan; include strategies for future source development and protection. Refer to "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Orange is commended for proactively coordinating with the emergency responders. Continue to work with the fire department, Board of Health, DPW, and local and state emergency officials. Include industries and the WWTP.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>PARTIAL</b>	Orange does have protective bylaws and regulations, however New Salem does not. For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Work with neighboring communities to adopt floor drain regulations.
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II and as appropriate Zone III.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Gale Brook School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
December 22, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Gale Brook School</b>
<i>PWS Address</i>	<b>Athol Road</b>
<i>City/Town</i>	<b>Orange, Massachusetts</b>
<i>PWS ID Number</i>	<b>1223010</b>
<i>Local Contact</i>	<b>Mr. James Majewski</b>
<i>Phone Number</i>	<b>1-888-377-7678</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1223010-01G	100	401	Moderate/High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Gale Brook School (the school) is located on the corner of Athol Road and Royalston Road in North Orange. Orange is a medium to large size town in northwestern Massachusetts, north of Quabbin reservoir. The school well serves the school and the library that is located on the same parcel. The school is home to the Head Start Program preschool. The total school student and staff population is less than 50 people per day. Although there is a municipal water system and a wastewater treatment facility in Orange, they do not serve the area where the school is located. Therefore, the school and surrounding facilities are served by on-site water supplies and septic disposal.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The school is served by one potable supply well. Well #1-01G is a 6-inch diameter, 400-foot deep, bedrock well that is located beneath a bulkhead that can be accessed through the basement of the school. There are 2275 gallon fuel oil tanks within containment in the basement along with the boiler; the floor drain in the basement was redirected to a surface discharge. The library has an underground fuel oil storage tank that the Town intends to remove when funding is available. There are two roads and several private homes within the IWPA.

The school is located on the southeast flank of Temple Hill, southeast of Whites Pond in the central Massachusetts highlands. The Tully River valley, east of the school is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 18,000 years ago. However, observations and geologic mapping indicates thin overburden deposits of till over bedrock on the hill where the school is located. The bedrock in the area is of the Bronson Hill Zone and mapped in the immediate area of Well #1 as garnetiferous schist of the Littleton Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 100 feet and an IWPA protective radius of 401 feet. These protective radii were based on the capacity of the well and Zone I ownership restrictions. Please refer to the attached map that shows the Zone I and IWPA.

There is no evidence of a continuous, protective confining layer such in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Yes	Yes	Moderate/High	AST in containment in basement/UST at the library in the IWPA.
School	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel.
Septic systems components	No	Yes	Moderate	Residential and the school's wastewater components are in the IWPA.
Transportation and parking	Yes	Yes	Moderate	Monitor stormwater runoff and redirect as necessary to protect the well.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Underground/Above ground storage tanks;**
3. **School facilities;**
4. **Transportation corridors/parking; and**

There are several activities within the Zone I and IWPA that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate/high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – The water supplier owns nearly the entire Zone I except for a small portion of North Road. However, the activities in the Zone I are non-conforming since the well is located beneath a bulkhead adjacent to school and the school and all associated activities are within the Zone I. Systems not meeting DEP Zone I requirements for ownership or control or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Zone I Recommendations:

- ✓ Prohibit any additional non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides, fertilizers or hazardous materials near the well.
- ✓ Inspect the well regularly to ensure the cap is secure and there is no standing water near the well.

**2. Underground/Above ground fuel oil storage** – There is a fuel oil UST in the IWPA and there are ASTs within containment in the IWPA. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store.

### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil, especially delivery.
- ✓ Have spill containment/absorbent materials available on-site

**3. School facilities** – Elementary and preschools generally

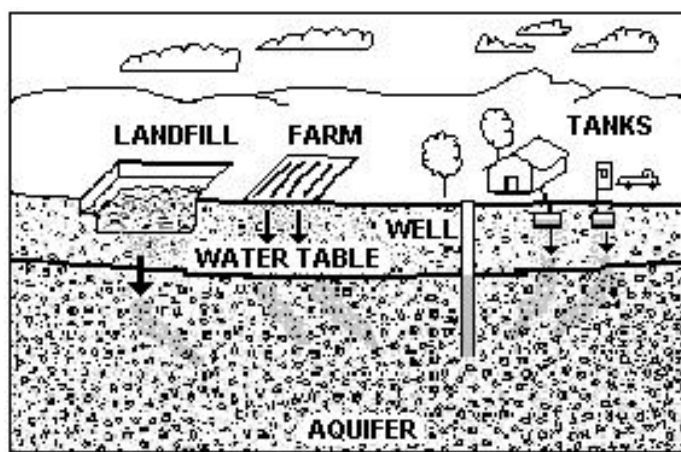


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

use only household type hazardous materials.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school.
- ✓ Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ For additional information, refer to the Massachusetts Public Health Associations Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**4. Transportation corridor/parking** – Transportation corridors and parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination among the emergency responders to be sure they are aware of the location of your well.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The DEP commends the school and the Town on their efforts to remove hazards from the protection area such as redirecting the floor drains and removal of potential hazardous materials from the basement, as well as efforts to acquire funds to remove the UST.

Please review and adopt the key recommendations listed above and as follows:

### Priority Recommendations :

- ✓ Communication with the Town boards and emergency responders regarding the location of the well and the protection areas and continue efforts to remove the UST.

### Zone I and IWPA:

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, cleaning products and household hazardous waste.

### Training and Education:

- ✓ Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.

### Planning:

- ✓ Request that local officials include the IWPA in the Aquifer Protection District and to continue assisting you in protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

## For THE FARM SCHOOL



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 11, 2004

### What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	The Farm School
<i>PWS Address</i>	Sentinel Elm Rd
<i>City/Town</i>	Orange, Massachusetts
<i>PWS ID Number</i>	1223012

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1223012-01G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

### What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

### What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

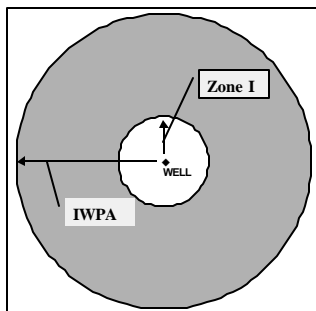
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1223012-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on septic system components and farm animals being located within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the local roads and other farm related activities located within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Reports, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information you submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ continue to manage manure storage and spreading as well as stormwater on site;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
OTIS RIDGE SKI AREA



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Otis Ridge Ski Area
<i>PWS Address</i>	159 Monterey Rd
<i>City/Town</i>	Otis, Massachusetts
<i>PWS ID Number</i>	1225013

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1225013-01G	198	500	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

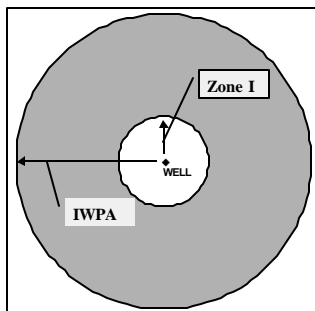
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1225013-01G)**

Zone I = 198 ft.  
IWPA = 500 ft.



### How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your 2000 Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
OTIS RIDGE SKI CAMP



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 10, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Otis Ridge Ski Camp
<i>PWS Address</i>	159 Monterey Rd
<i>City/Town</i>	Otis, Massachusetts
<i>PWS ID Number</i>	1225019

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1225019-01G	113	427	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

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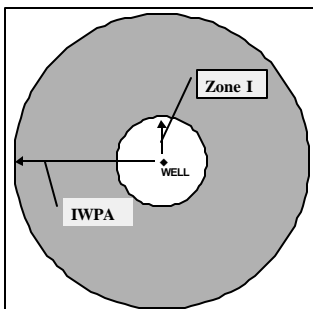
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The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
# 1 (1225019-01G)**

Zone I = 113 ft.  
IWPA = 427 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The system disinfects the water prior to distribution. The **moderate** susceptibility to potential non-microbial threats is based on buildings and parking areas within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

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- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Farmington River Regional Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

November 26, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Farmington River Regional Elementary School</b>
<i>PWS Address</i>	<b>555 North Main Road</b>
<i>City/Town</i>	<b>Otis, Massachusetts</b>
<i>PWS ID Number</i>	<b>1225040</b>
<i>Local Contact</i>	<b>Mr. Garth Story</b>
<i>Phone Number</i>	<b>413-269-4466</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1225040-01G	200	503	Low

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Farmington River Regional Elementary School (the school) is a rural, elementary school located on the west side of North Main Road in Otis. The school student and staff population is approximately 235 people per day and is served by a single potable supply well (Well #1) located southeast of the school. The school is served by the Town's municipal sewer system; all sewer components are located outside of the Zone I.

The well has a Zone I protective radius of 200 feet and an Interim Wellhead Protection Area (IWPA) radius of 503 feet based on a pumping rate that was approved by the DEP in 1995. Please refer to the attached map that shows the Zone I and IWPA. The Zone I

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller.

The 6-inch diameter bedrock well is 405 feet deep. It is located approximately 425 feet southeast of the school. Geological mapping in the area identifies the bedrock as the Taconic-Berkshire Zone, consisting of granite, diorite and granitic gneiss. There is no evidence of a confining unit such as clay in the area. In fact, bedrock outcrops of granite were noted throughout the area during the site visit. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information. Please note that the land use descriptions are limited and the school area is described as Urban Open space for lack of a better descriptor.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, very few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. School facilities
2. Town facilities

The Farmington River School well is fairly well protected. There were no activities within the Zone I that pose a significant threat to the water supply. Although there are a few activities of concern within the IWPA, based on the topography, it appears those activities are primarily downgradient of the well. The overall ranking of susceptibility to contamination for the well is low. Please refer to Table 2.

**1. School Facilities** – Elementary schools generally use only household type hazardous materials for cleaning, pest control and lawn care. Part of the recreation field is within

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Town salt shed	No	Yes	Moderate	Salt shed on the edge of IWPA, is covered and downgradient
School building and athletic fields	No	Yes	Moderate	Use BMPs for household type hazardous materials; do not use pesticide/fertilizers on fields
Transportation corridor	No	Yes	Moderate	Route 8
Residential development	No	Yes	Low	100% municipal sewer
Town garage	No	No	--	Currently not registered as a VSQG

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/den/hrn/dws/](http://www.state.ma.us/den/hrn/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

the IWPA of the well. Potential exists for contamination of the well by fertilizers, herbicides, and pesticides, all of which can be of concern.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices for field maintenance within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.

**2. Town facilities** – A section of roadway (Route 8) is within the IWPA of the well. However, drainage discharges away from the well. In addition, the Town salt shed and the Town garage are partially in or just outside of the IWPA. All of these appear to be topographically down gradient of the well. The Town highway garage is not registered as a very small quantity generator. To enhance protection of the public and private water supplies in the area, BMPs should be utilized at all facilities.

### Recommendations:

- ✓ Monitor the parking lot and roadside for spills and leaks. Be sure the highway and police departments are aware of the well locations and notify you in the event of an accident on the roadway that results in a release that may impact the well.
- ✓ Use BMPS for handling of all hazardous materials.
- ✓ A copy of "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" and a fact sheet for Very Small Quantity Generators have been sent to the Board of Selectmen. Although the Town's Transfer station is registered, it is recommended that the Town Highway Department review it's status and register as required.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. Farmington River Regional Elementary School and the Town of Otis are commended for the effort shown in siting the well connecting to the municipal sewer and current protection efforts.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking area.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

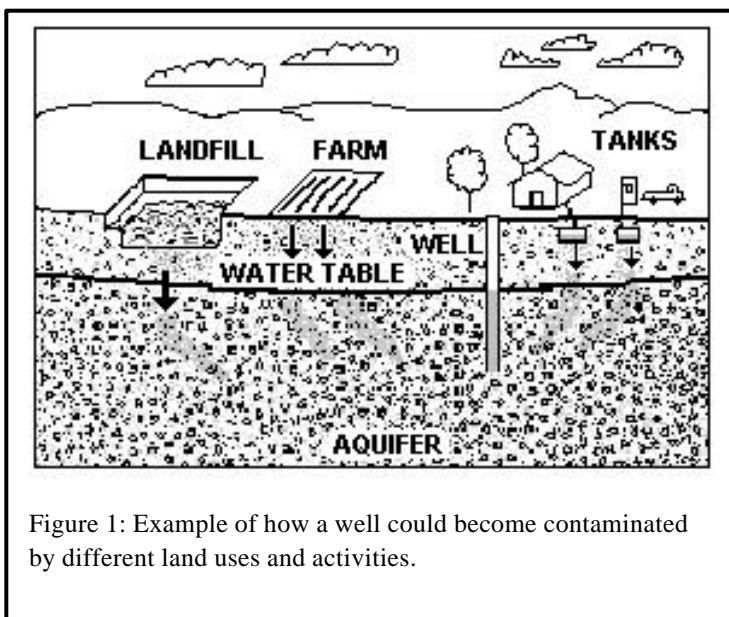


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### Facilities Management:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.

### Planning:

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Developing a Wellhead Protection Plan
- Recommended Source Protection Measures Fact sheet
- Grant Program Fact Sheet
- Source Protection Sign
- Very Small Quantity Generator (VSQG) information



# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
KATIES COUNTRY STORE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 24, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Katies Country Store
<i>PWS Address</i>	Rte 23
<i>City/Town</i>	Otis, Massachusetts
<i>PWS ID Number</i>	1225041

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1225041-01G	100	410	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

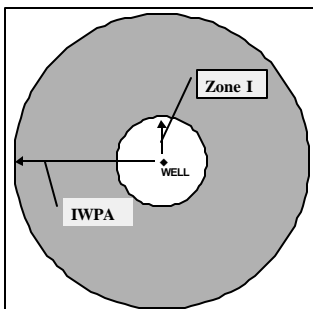
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#1 (1225041-01G)**

Zone I = 100 ft.  
IWPA = 410 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the local roads, underground storage tanks, and hazardous materials storage within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Palmer Water District #1**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Palmer Water District #1
<i><b>PWS Address</b></i>	10 Walnut Street
<i><b>City/Town</b></i>	Palmer
<i><b>PWS ID Number</b></i>	1227000
<i><b>Local Contact</b></i>	Mr. James Ammann, Superintendent
<i><b>Phone Number</b></i>	413-283-8411

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

**System Susceptibility:**

**High**

### Groundwater Sources

**Zone II # 237**

Source Name	Susceptibility: High
Galaxy Wellfield	1227000-01G
GP Well #2	1227000-02G

### Surface Water Sources

Source Name	Susceptibility: Moderate
Upper Reservoir, Graves Brook	1227000-01S
Lower Reservoir, Graves Brook	1227000-02S

Palmer is a medium sized, industrial community in west, central Massachusetts. Palmer, established in the early 1700's, initially developed as an industrial community along the numerous brooks and rivers that flow through the area. Palmer consists of four villages: Bondsville, Three Rivers, Thorndike and Depot Village. The Swift River flows into the Ware River and the Ware and Quaboag Rivers join to form the Chicopee River. The area east of the confluence is known as Three Rivers. The Quaboag River forms part of the Eastern and southern boundaries of the Town.

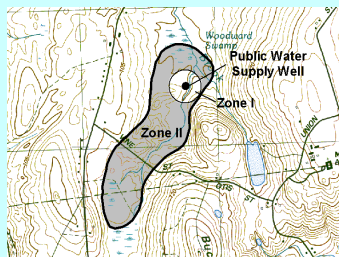
There are four community public water supply systems in Palmer: Thorndike, Palmer, Bondsville and Three Rivers Fire Districts. The Bondsville District currently supplies water to the Thorndike system with the Three Rivers District supplying a portion due to previous water quality problems with the Thorndike Fire District's source. Palmer Water District #1 maintains four active water supplies: two surface water sources, Upper (1227000-01S) and Lower (1227000-02S) Graves Brook Reservoirs and two groundwater sources, Galaxy Wellfield (1227000-01G) and the Gravel Packed well (1227000-02G). The surface water supplies are located in the south, central section of town off of Reservoir Street. Water from the surface water supplies is treated through the Graves Brook Water Treatment Plant, a Trident microfloc filtration system using alum nonionic polymer as a flocculent, sodium hydroxide and trimetaphosphate for corrosion control and finally sodium hypochlorite for disinfection prior to distribution. The

surficial geology is mixed, consisting locally of sand and gravel associated with glacial outwash and in some areas, thin till over bedrock. The watersheds are underlain primarily by gneiss, as can be seen at the outcrops surrounding and gravel pit near the reservoir.

The groundwater supplies are located in the deep sand and gravel, glacial outwash and alluvial deposits along the Quaboag River valley south of an industrial area along Route 20. The Galaxy wellfield consists of 19, 2½-inch diameter, shallow (20-25 feet deep), closely located wellpoints. The Zone I for the wellfield is delineated as an oval approximately 250 feet radial distance from the outer wellpoints. The Gravel Packed well, installed in 1970, is a 65-foot deep, 18 by 48-inch diameter, gravel packed well located southeast of the Galaxy wellfield and has a Zone I radius of 400 feet. Water from both sources is treated through a granular activated carbon to remove volatile organic compounds, has trimetaphosphate and sodium hydroxide added for corrosion control and is disinfected with sodium hypochlorite prior to distribution. The Department has identified several responsible parties for the release of

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



hazardous materials. Additional information regarding the current water quality and status of confirmed release sites may be obtained from the Department's Bureau of Waste Site Cleanup and Drinking Water Program at the Springfield Regional Office.

The Quaboag River valley, where the groundwater supplies are located, is a glacially deepened, buried bedrock valley. The valley was filled with stratified, sand and gravel deposits during the recession (melting) of the glaciers some 10,000 to 12,000 years before present. The Quaboag valley trends primarily east west and is joined by the Chicopee Brook valley trending south to north, just south of the well sites. The bedrock geology of the area of the area is mapped as layers of gneiss, amphibolite, and augen gneiss.

Aquifer parameters were determined from multiple, extended duration pumping tests and the Zone II for the wells was delineated based on conceptual and analytical modeling in conjunction with geological mapping. Under various pumping scenarios, groundwater may be contributed from the Chicopee Brook valley and induced from the Quaboag River. Please refer to the attached map to view the boundaries of the Zone II. For current information on water quality

monitoring results and treatment processes, please refer questions to the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Palmer Water District's wells is a mixture of industrial, light commercial, residential and agricultural areas (refer to attached map for details). The land uses in the watersheds are forested water supply land and low density residential. The Palmer Water District owns almost the entire watershed for the reservoirs. The most significant threat to the surface water supplies is from natural, microbial threats, potentially from forestry and from beavers. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Tables of Regulated Facilities attached in Appendix B.

### Key Land Uses and Protection Issues include:

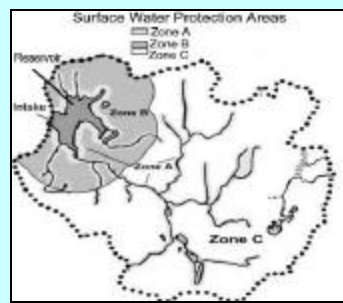
1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous waste contamination sites
6. Protection Planning
7. Agricultural activities
8. Railroad/Pipeline Right of Way
9. Potential presence of Beavers in Surface Water Sources
10. Water Treatment Facility

The overall ranking of susceptibility to contamination for the system is high. The susceptibility to contamination of the surface water supplies is moderate while the groundwater supplies is high, based on the presence of numerous high ranking threat land uses within the Zone II. Please refer to Table 2.

**1. Non-conforming Zone I** – Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to control the Zone I through ownership or some other mechanism such as a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. Palmer Fire District does not own the entire Zone I for either groundwater source. Within the Zone Is are a gas/oil pipeline right-of-way,

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.





transportation corridors, and some residences.

#### Zone I Recommendations:

- ✓ Obtain a Right-of-First Refusal for acquiring additional land within the Zone I currently not owned by the District.
- ✓ Consider purchasing the land or acquiring a conservation restriction on the land to minimize potential threats.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Contact the property owners to be sure they are aware they are within the Zone I and Zone II of the wells. Provide information about BMPs.

**2. Residential Land Uses** – Approximately 25% of the Zone II consists of residential areas. The reservoir watershed has less than 1% of the land use as

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

residential. From this perspective, residential land uses are more of a potential threat within the Zone II than in the watershed areas. However, nearly the entire Zone II area is served by municipal sewer. There are a few residents in the watershed and Zone II that utilize on site septic disposal. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. There are some residential uses within the Zone A of the reservoirs as well. Common potential sources of contamination include:

- **Septic Systems** – Improper maintenance and disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems discharge directly to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include petroleum products for automotive and lawn care, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

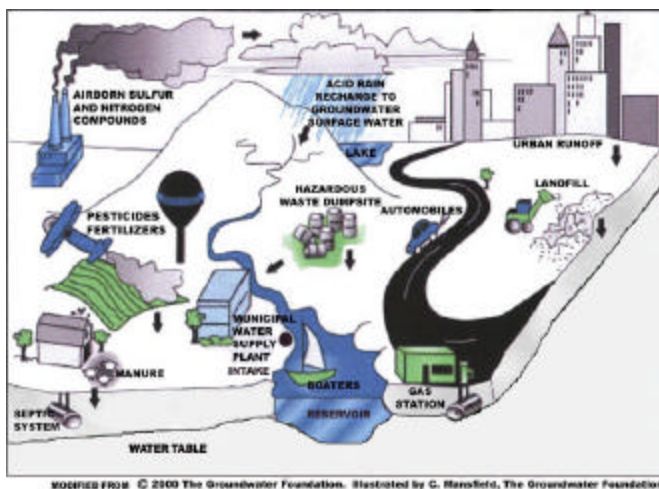


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ Work with planners to manage and control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Continue catch basin cleaning routines.

**3. Transportation Corridors** - Route 20 and Route 32 run through part of the Zone II, and local roads are common throughout the Zone II and watershed. The transportation corridors are more heavily traveled in the Zone II than in the watershed, and are therefore a greater threat in the Zone II; however, it is equally important to use best management practices in both areas. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II or Watershed	Potential Contaminant Sources*
<b>Agricultural</b>				
Fertilizer Storage or Use	2	M	Zone II	Fertilizers: leaks, spills, improper handling, or over-application
Forestry Operation	Selectively	L	Watershed	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Nurseries	1	M	Zone II	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or	1	H	Zone II	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Car/Truck/Bus Washes	1	L	Zone II	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	1	H	Zone II	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/Auto Repair Shops	1	H	Zone II	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Termi-	1	H	Zone II	Fuels and maintenance chemicals: spills, leaks, or improper handling
Golf Courses	1	M	Zone II	Fertilizers or pesticides: over-application or improper handling
Junk Yards	2	H	Zone II	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Medical Facilities	1	M	Zone II	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Paint Shops	1	H	Zone II	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Photo Processors	1	H	Zone II	Photographic chemicals: spills, leaks, or improper handling or storage

Land Uses	Quantity	Threat	Zone II or Watershed	Potential Contaminant Sources*
<b>Commercial (continued)</b>				
Railroad Tracks And Yards	Numerous	H	Zone II	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances, Etc.)	1	H	Zone II	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	Both	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Industrial</b>				
Asphalt Plants	1	M	Zone II	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Chemical Manufacture Or Storage	Numerous	H	Zone II	Chemicals and process wastes: spills, leaks, or improper handling or storage
Foundries or Metal Fabricators	1	H	Zone II	Solvents and other chemicals: spills, leaks, or improper handling or storage
Hazardous Materials Storage	2	H	Both	Hazardous materials: spills, leaks, or improper handling or storage (Water Treatment facility located in Zone A)
Hazardous Waste Storage, Treatment and Recycling	1	H	Zone II	Hazardous materials: spills, leaks, or improper handling or storage
Industrial Lagoons and Pits	1	H	Zone II	Liquid wastes: improper seepage or overflows
Industry/Industrial Parks	1	H	Zone II	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Metal Plating	1	H	Zone II	Solvents, other chemicals, and process wastes: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	Zone II	Solvents and metal tailings: spills, leaks, or improper handling
Petroleum Storage Facilities	1	H	Zone II	Petroleum products and equipment maintenance chemicals: spills, leaks, or improper handling or storage
<b>Residential</b>				
Fuel Oil Storage	Numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal

Land Uses	Quantity	Threat	Zone I or Watershed	Potential Contaminant Sources*
<b>Miscellaneous</b>				
Aboveground Storage Tanks	Numerous	M	Both	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Periodic	L	Watershed	Microbial contaminants
Combined Sewer Overflows	1	L	Zone II	Microbial and non-microbial contaminants including industrial wastewater; improper disposal of hazardous wastes
Large Quantity Hazardous Waste Generators	3	H	Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	7	--	Zone II	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B. Contact DEP BWSC for additional information.
Pipeline (Oil and sewer)	1	M	Zone II	Oil or sewage: spills or leaks
Road and Maintenance Depots	1	M	Zone II	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Small Quantity Hazardous Waste Generators	1	M	Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Zone II	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Tire Dumps	1	M	Zone II	Tires: improper handling or management
Transmission Line Rights-of-Way (Oil/Electric)	2	L	Zone II	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Zone II	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Utility Substation Transformers	1	L	Zone II	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	12	L	Zone II	Hazardous materials and waste: spills, leaks, or improper handling or storage

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

**4. Hazardous Materials Storage and Use**— About 11% of the land area within the Zone II is commercial or industrial land uses. Many businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. As Palmer is well aware, if hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ **Hazardous Materials Program Best Management Practices** - Support the development and implementation of a hazardous materials program that includes a By law or Health Regulation. Such a program educates businesses on hazardous material management requirements, explicitly informs the business community what is expected of them, and decreases the potential future liability businesses may be unknowingly creating for themselves. A local program lets the town serve as a consultant, helping businesses protect themselves. See DEP's website for additional information on developing a program for hazardous materials management at <http://www.state.ma.us/dep/brp/dws/files/hazmat.doc>. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ **Register Hazardous Waste Generators** - Work with local businesses and the Board of Health to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ **Floor Drains** - Work with the local Board of Health to educate local businesses on Massachusetts' floordrain requirements. See brochure "Industrial Floor Drains" for more information.
- ✓ **Storage Tanks** - Support your local fire department in upgrading all above and below ground oil/hazardous material storage tanks in order to meet current construction standards. Funding for replacing of non-residential underground storage tanks is available through the MA Department of Revenue. For more information, refer to [http://www.dor.state.ma.us/ust/ust\\_home.htm](http://www.dor.state.ma.us/ust/ust_home.htm)
- ✓ **Inspection Program** - Coordinate efforts with local officials and the other water districts in Palmer to develop and implement an Inspection Program that is usually conducted by the local Board of Health to prevent hazardous substances from entering water supplies. Inspections target facilities that generate, use, store, or disposal of hazardous/toxic materials. Programs can also include floor drain inspections and underground storage tanks. Local inspection programs often provide educational material and technical assistance on Best Management Practices.

- Building Inspectors are often involved in local inspection programs.
- ✓ **Lawn care and Landscaping** - Encourage local businesses to incorporate Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides. For more information, refer to [http://www.massdfa.org/pesticides/publications/IPM\\_kit\\_for\\_bldg\\_mgrs.pdf](http://www.massdfa.org/pesticides/publications/IPM_kit_for_bldg_mgrs.pdf)
  - ✓ **Office of Technical Assistance** - For additional help regarding environmental requirements and toxic use reduction approaches to compliance contact the Office of Technical Assistance (OTA) for Toxic Use Reduction. The OTA is a non-regulatory agency within the Commonwealth's Executive Office of Environmental Affairs. OTA provides free, confidential assistance on toxic use reduction opportunities. <http://www.state.ma.us/ota/>

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0000593, 1-0000827, 1-0010792, 1-0000681, 1-0000716, 1-0000140 and 1-0000139. Refer to the attached map and Appendix C for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Continue your current practice of monitoring progress of ongoing remedial action conducted for the known oil or contamination sites.

**6. Protection Planning** – Currently, Palmer does not have a Wellhead Protection Plan, but the Town does have a Watershed Protection Districts and a zoning By law. The by law has not been approved by DEP for compliance with water supply protection control regulations 310 CMR 22.21(2). A Watershed Protection Plan has been submitted and approved by the Department's Boston office for content and procedures. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The

**Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

development of a successful Wellhead Protection Plan is outlined in five steps in DEP's "Developing a Local Wellhead Protection Plan" (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Wellhead Protection Area
- Identify potential sources of contamination
- Protect and manage the wellhead protection area
- Conduct ongoing public education and outreach

A Watershed Protection Plan was recently developed for the reservoirs. During the assessment it was determined that the watershed is incorrectly delineated along the northern border of the watershed. It appears that the watershed area identified in the plan is larger than the actual watershed area. The Department will coordinate and work with Palmer Fire District to rectify any inaccuracies and encourages you to correct any inaccuracies prior to implementing any activities within the area in question.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Work with the other Palmer water suppliers in a coordinated effort with the town of Palmer to protect all of Palmer's water supplies. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials and other town water suppliers to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If the local controls do not meet the current regulations, or the overlay District does not cover the entire recharge area, adopt controls that meet 310 CMR 22.21(2) and request modification of the District outlines. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local Board of Health controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).

**7. Agricultural Activities** – Crop and pasture lands make up about 8% of the land use in Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

**8. Railroad/Pipeline Right-of-Way** – The railroad runs through the entire Zone II. The pipeline runs through the Zone II and part of the Zone I. Rail corridors that serve passenger and/or freight trains are a potential source of contaminant due to chemicals released during normal use, track maintenance, and accidents. The pipeline carries refined petroleum products and therefore the risk is from a rupture in the line. Normal maintenance of a right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on railroad right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train/track maintenance chemicals are also potential sources of contamination to the water supply.

**Right of Way Recommendations:**

- ✓ Review the right-of-way Yearly Operating Plan from both the railroad and the oil company to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses.
- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the rights-of-way including coordination with the owner/operator of the track and pipeline using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from accidents within the Zone I and Zone II, which should attempt to include representatives from the owner/operator of the rights-of-way.

**9. Presence of Aquatic mammals in Surface Water Watershed** – There is the potential for aquatic mammals (beavers and muskrats) living in and near the surface water supplies. Aquatic mammals pose a potential threat of microbial

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

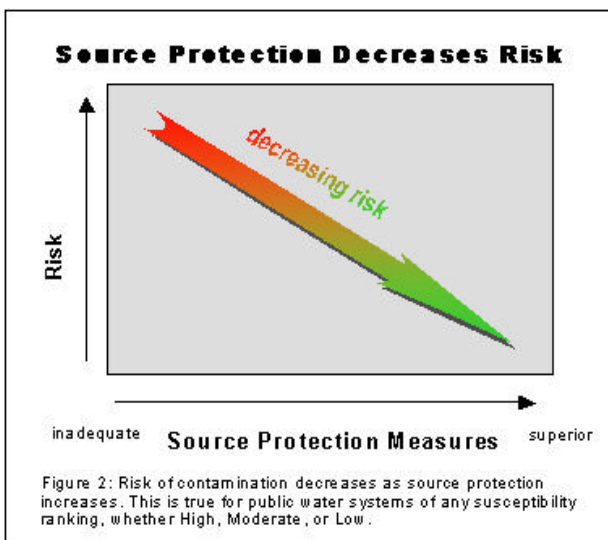
1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

Land uses within the Zone III were not assessed for this report.

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.



contamination of the source from *Giardia Lamblia* and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water.

**Presence of Beavers in Surface Water Sources**

**Recommendations:**

- ✓ Monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake. Monitor raw water quality and assess potential impacts.

**10. Water Treatment Facility** - The Palmer water treatment facility is located within the Zone A of the upper reservoir. The facility is served by municipal sewer but has a lagoon in the event they need it. They have never used the lagoons. Activities associated with water treatment involve



storage and use of hazardous materials such as chlorine, sodium hydroxide and fuel oil for the generator. All chemicals are stored above ground in secondary containment. The facility also has a garage for vehicle storage. According to the watershed protection plan, storm water from the facility discharges outside of the watershed. Spills or leaks of hazardous materials during handling and delivery and storm water are a potential source of contamination.

**Water Treatment Facility Recommendations:**

- ✓ Ensure water treatment facility is operated and maintained according to DEP requirements.
- ✓ Ensure stormwater drains and the drainage system around the treatment plant do drain outside of the watershed. Maintain catchbasins as necessary.
- ✓ Continue current use of best management practices for proper handling of materials and in containing spills and leaks.
- ✓ Update emergency plans as necessary.

Other land uses and activities within or immediately adjacent to the Zone II that have potential for contamination include repair shops, large equipment storage, a greenhouse, a former oil business and a large agricultural supply facility. Additionally, there are facilities that may not be registered as hazardous materials handlers or are presently vacant. Future use of these sites should be monitored.

Refer to Table 2 and Appendix 2 for more information about these land uses.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

Although the Zone II contains numerous existing and potential sources of contamination, awareness and source protection measures reduces the risk of actual contamination, as illustrated in Figure 2. Identifying additional potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those listed above and below should be used to better protect your water supply. Palmer's surface water supply is well protected through ownership of the nearly the entire watershed. Palmer is commended for the efforts taken to protect the reservoir and identifying additional threats to the groundwater supply. Palmer Fire District has been proactive in monitoring progress of remedial actions at the confirmed release sites.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watersheds when responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Communicate with owners/operators of the rights-of-way to be sure
- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Correct any inaccuracies in the Watershed Protection Plan and implement the plan. The Department can assist you in correcting the mapping.

➤ **Partner with Local Businesses:**

Since many businesses and industries, including small businesses, use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Provide Outreach to the Community:**

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is planning, such as the adoption of local controls to protect watersheds and ground water. These controls may include health regulations, general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

➤ **Plan as a community:**

Palmer currently has four different water districts. Review the consolidation feasibility studies, updating them as necessary and proceed in a manner that is beneficial to public health and safety and is fiscally responsive. The Department strongly encourages consolidation of systems when it assists in system compliance, is economically advantageous and enhances redundancy and water supply protection. This effort will require community leadership.

**Resources for Drinking Water Source Protection:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR). Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

**Conclusions:**

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II and watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	<b>No</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. To the extent possible, remove non-water supply activities from each Zone I and prohibited activities in Zone A to comply with DEP's Zone I and Zone A requirements. Investigate options for gaining ownership or control of the Zone I for groundwater sources.
Are the Zone 1 and Zone A posted with "Public Drinking Water Supply" Signs?	<b>Yes</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone 1 and Zone A regularly inspected?	<b>Yes</b>	Continue daily inspections of drinking water protection areas.
Are water supply -related activities the only activities within the Zone 1 and Zone A?	<b>No</b>	Monitor non-water supply activities in Zone I and prohibited activities in Zone A, and investigate options for removing these activities.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2)	<b>No</b>	While the town has bylaws, they have not been reviewed by DEP. Continue working with the Planning Board and the Board of Selectmen to adopt land use controls that meet 310 CMR 22.21(2) and 310 CMR 22.20C. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>No</b>	Palmer Water District should request that Monson expand their Wellhead Protection to the Zone II that extends into Monson.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>Yes/No</b>	Work with the Department to correct the surface water supply protection plan. Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>No</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams and other water suppliers.
Does the municipality have a watershed and wellhead protection committee?	<b>No</b>	Reconvene committee; include representatives from citizens' groups, other water/fire districts, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>Unknown</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Work with Town and other water suppliers.
Does the PWS provide watershed protection education?	<b>Some</b>	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and watershed.

# APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

## DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
131172	Rathbone Precision Metals, Inc.	1241 Park Street	PALMER	Toxic User	Large Quantity	Industrial
				Hazardous Waste Generator	Large Quantity	
				Oil Waste Generator	Small Quantity	
				Air Handler	Minor (BM150)	
32847	Massachusetts Electric Company	#503 Substation, Blanchard Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Utility
				Oil Waste Generator	Large Quantity	
134293	Palmer Trailer Sales Company, Inc.	158 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Commercial
36726	Baker's Auto Body	702 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Auto Repair
37852	Buddy's Citgo	1150 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Service Station
131175	Palmer Paving Corporation	25 Blanchard Street	PALMER	Plant	RES Application Approved	Paving Company
				Plant	Emission Stack Tester	

				Recycler	Class A Permit	
				Fuel Dispenser	Fuel Dispenser	
				Hazardous Waste Generator	Very Small Quantity	
				Oil Waste Generator	Very Small Quantity	
318144	Massachusetts Highway, Palmer	Blanchard St	PALMER	Fuel Dispenser	Fuel Dispenser	Maintenance Depot
118209	Jarvis and Jarvis	127 S. Main Street	PALMER	Toxic User		
				Hazardous Waste Generator	Very Small Quantity	
				Oil Waste Generator	Large Quantity	
223072	2000 Food & Fuel	1239 Park Street	PALMER	Fuel Dispenser	Fuel Dispenser	Service Station
2807	Palmer Santucci	1239 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	
283651	Jackson's Auto Sales and Service	1307 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Auto Repair
132190	Contech Construction Products	Fenton Street	PALMER	Oil Waste Generator	Very Small Quantity	Construction Company
	Northern Tree Service	290 Park Street	PALMER	Hazardous Waste Generator	Very Small Quantity	Tree Service

## Underground Storage Tanks:

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
2000 Food & Fuel	1239 Park St	Palmer	Convenience, Gas Station	1 Wall	Approved In Tank Monitor	10,000	Gasoline
				1 Wall	Approved In Tank Monitor	8,000	Gasoline
				1 Wall	Approved In Tank Monitor	8,000	Gasoline
Massachusetts Highway Palmer	Blanchard St	Palmer	Fuel Dispenser	?			
Palmer Paving Corporation	25 Blanchard Street	Palmer	Fuel Dispenser	?			

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000593	150 Park Street	Palmer	Hazardous Material
1-0000681	127 South Main Street	Palmer	Oil
1-0000140	Riverview Parkway	Palmer	Oil
1-0000716	239 Park Street	Palmer	Oil
1-0010792	184 Park Street	Palmer	Oil
1-0011079	241 Park Street	Palmer	Hazardous Materials
1-0010903	158 Park Street	Palmer	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Bondsville Fire & Water District**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Bondsville Fire & Water District
<i><b>PWS Address</b></i>	P.O. Box 179
<i><b>City/Town</b></i>	Palmer
<i><b>PWS ID Number</b></i>	1227002
<i><b>Local Contact</b></i>	Mr. Robert Flagg
<i><b>Phone Number</b></i>	(413) 283-9922

### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

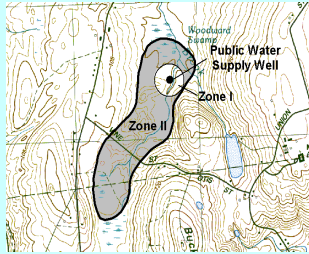
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**System Susceptibility**

**High**

**Zone II #: 103**

**Susceptibility: High**

Well Names	Source IDs
Well #1	1227002-01G
Well #2	1227002-02G
Well #4	1227002-04G
Well #5 (Proposed)	

Bondsville is a village within the town of Palmer Massachusetts, a medium sized community in south central, Massachusetts. Palmer, established in the early 1700's, initially developed as an industrial community along the numerous brooks and rivers that flow through the area. Palmer consists of the villages of Bondsville, Three Rivers, Whipples, Thorndike and Palmer. The Swift River flows into the Ware River and the Ware and Quabaug Rivers join to form the Chicopee River. The Swift River forms the northwestern boundary of Palmer between Palmer and Belchertown. Bondsville is located along that portion of the Swift River.

There are four community public water supply systems in Palmer: Thorndike, Palmer, Bondsville and Three Rivers Fire Districts. The Bondsville District currently supplies water to the Thorndike system with the Three Rivers District supplying a portion of Thorndike's water. Thorndike purchases water from Bondsville and Three Rivers because of previous water quality problems with the Thorndike Fire District's source. Bondsville Fire & Water District maintains three active water supply Wells #1 (1G), #2 (02G) and #4 (04G); Well #4 was installed adjacent to Well #3, to replace the Well #3 due to decreased capacity. Well #3 has been maintained as an emergency source. Bondsville Fire & Water District is presently completing the final stages of the New Source Approval Process for Well #5. Once proposed well #5 is put into service, Well #3 will be abandoned as a public water supply.

All of the wells are located within the same unconfined sand and gravel aquifer, immediately adjacent to the Jabish Brook in the town of Belchertown. Well #1 is approximately 200 feet east of Well #2 and Well #4 is approximately 200 feet northeast of Well #1. Wells #1 and #2 are on the west side of Jabish Brook and Well #4 is on the east side. All of the wells are located approximately 80 feet from the brook channel. Well #1 is a gravel packed well, while Wells #2 and #4 are gravel developed wells. All of the wells are between 54 and 57 feet deep. Since the wells are all located within close proximity to each other and within the same hydrogeologic regime, they share the same Zone II contribution area. The wells and the entire Zone II are located within the Town of Belchertown.

The wells are located in sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 years before the present. Streams and rivers have reworked the deposits and recent streams have deposited additional alluvial material. Boring logs and maps in the vicinity of the wells indicate

medium to coarse sand deposits approximately 45 to 85 feet in depth. There is no evidence of a confining clay layer. Groundwater modeling conducted to delineate the Zone II, indicates that under extended duration pumping conditions, Jabish Brook contributes water to the aquifer. Geologic mapping of the area shows the bedrock in the area mapped as the Belchertown Complex, an igneous, quartz monzodiorite.

Each well has a Zone I radius of 400 feet and the Zone II was delineated as part of the New Source Approval process utilizing geological mapping and analytical modeling. The Zone II for Well #5 was delineated through a numerical model and for the most part mimics but slightly modifies the existing Zone II. Data for the analysis was gathered from extended duration pumping tests. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II and consult the Consumer Confidence report for current water quality data. Belchertown's overlay Aquifer District includes all stratified drift (sand and gravel aquifer) areas within town and there are protective bylaws associated with that overlay district. In addition, the Board of Health has adopted groundwater supply protection regulations for the Aquifer District. The Board of Health intends to modify language in the regulations and adopt a floor drain regulation to be in compliance with 310 CMR 22.000.

Water is chlorinated for disinfection prior to distribution. For current information on water quality monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

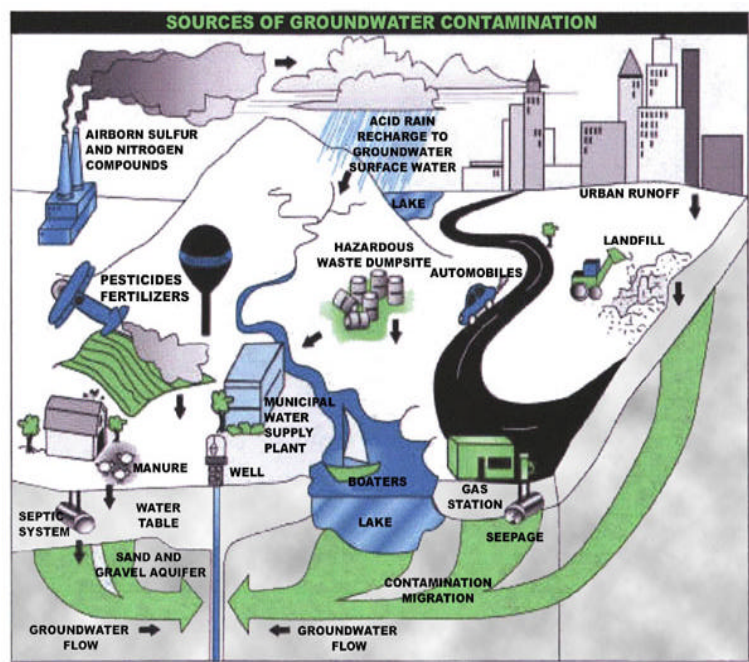
The land use within the Zone II for the Water District wells is a mixture of forest, cropland, grazing and residential (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Zone I
2. Residential land uses
3. Transportation corridor, railroad and right-of-way
4. Agricultural activities
5. Comprehensive protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Zone Is** – The Zone I for all of the wells is a 400 foot radius around the well casing. Currently, Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction, Memorandum of Understanding or other legal mechanism as approved by the DEP. The public water supplier does not own the entire Zone I for wells #1 through #4. The District does own the Zone I for Well #5. Only activities directly related to the water supply, or other no-threatening activities, as determined by the DEP, are allowed in the Zone I.



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The wells are located within the floodplain of Jabish Brook. The Water District has recently acquired additional land within the Zone II to protect the water supply area. The Vermont Central Railroad and a portion of Bardwell Road are within the Zone I area. The District has received a verbal agreement from the railroad company that they will not use chemical pesticides within the Zone I. The motor control building is located within the Zone I and has a tight tank installed for the facility's floor drain.

#### Zone I Recommendations:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Where it is feasible, consider for future expansion, options for purchasing land and/or negotiate a conservation restriction for land adjacent to the existing Zone I.
- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
  - A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of fields within the Zone I would not have manure, fertilizers or pesticides spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.
  - A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.

The Department commends the Bondsville Fire & Water District for its proactive efforts to acquire property and control activities within the Zone I and recommends continued efforts in establishing a program for planning to acquire ownership or control of additional property within the areas critical to protecting water quality. If there is no other reasonable method to secure rights and protect these sources, the Water District may wish to consider taking necessary water supply land by eminent domain to protect the sources. This recommendation is not only for the existing sources but also should be considered for future development of sources, if they are needed. We recommend consulting your Solicitor regarding land takings in another community.

**2. Residential Land Uses** – Portions of the Zone II consist of residential areas. The Zone II areas are not connected to municipal sewer and therefore utilize on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking

#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

#### Source Protection Decreases Risk

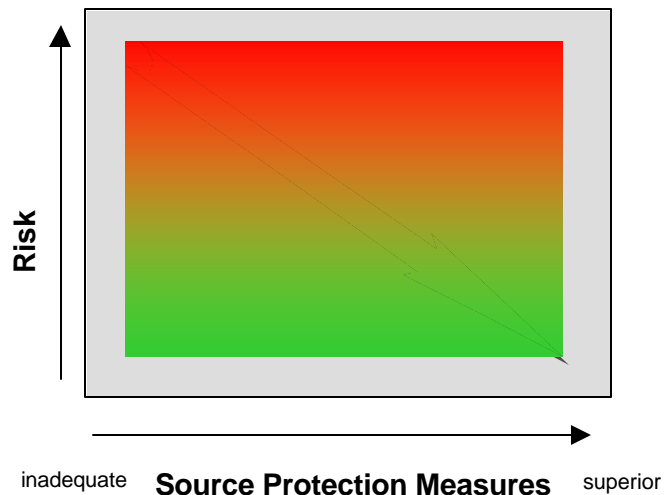


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agriculture</b>			
Fertilizer / Pesticide Storage or Use—Crops	1	H	Fertilizers: leaks, spills, improper handling, or over-application
Farm animal—non-commercial (horses)	1	M	Manure (microbial contaminants): improper handling
Manure Storage	1	H	Microbial and nutrient contamination to surface and groundwater
Hazardous materials—farm equipment	Few	M	Fuel storage, petroleum products for equipment
<b>Residential</b>			
Fuel Oil Storage (at residences—ASTs/USTs)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Transportation corridors	1	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Pole mounted electrical transformers	Several	L	MODF and possibly PCBs: spills, leaks, or improper handling. Most transformers have been converted to non-PCB. Contact the electric company to ensure no PCBs are within the transformers especially in Zone I.
Right-of-way (water)	1	L	Corridor maintenance, over-application or improper handling of pesticides.
Railroad tracks	1	H	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals. Verbal agreement to use mechanical methods.
Cemetery	1	M	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)



**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider working with the Fire Chief to inventory fuel sources and storage methods in the Zone II. Provide BMPs to homeowners for fuel oil storage.



**3. Transportation corridors, railroad and right-of-way** - A portion of Bardwell Road runs through the Zone I and several other local roads run throughout the Zone II area. Roadway construction, stormwater runoff, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are also frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater and wash into catchbasins or directly into streams and brooks.

Railroad tracks run through the Zone II. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

**Recommendations:**

- ✓ Identify stormwater drains and the drainage along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. Where it is practical recommend water quality swales to slow stormwater flow and settle out sediments before they discharge to surface water.

- ✓ Contact the Town to ensure stormwater systems are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Continue current efforts of working and planning with local emergency response teams to ensure that any spills within the Zone II can be effectively contained and the Water District is notified.

**4. Agricultural Activities** – There are a few farms (commercial/non-commercial—crop, hay and pasture) throughout the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure piles and field application are potential sources of contamination to ground and surface water supplies. In addition, farms and large commercial facilities often conduct their own maintenance on their equipment and have storage of hazardous materials and waste.

**Agricultural Activities Recommendation:**

- ✓ If appropriate, work with the DEP to negotiate Conservation Restrictions for these land areas.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Hadley at 413-585-1000 for assistance.

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

- ✓ Encourage farmers and property managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for on-site storage of fuel oil, handling, storage, and disposal of hazardous materials, and emergency response planning. Request that farmers evaluate their status as hazardous waste generators and register, as appropriate.
- ✓ Encourage farmers to manage pesticides, fertilizers and manure and store them within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>, and call the local office of the NRCS for assistance.
- ✓ Work with hobby farmers by supplying them with information regarding protecting their own wells and the public water supply by encouraging the

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**5. Comprehensive Protection Planning** – Currently, the Town of Belchertown does have water supply protection controls that meet the requirements of the Department's Wellhead Protection regulation 310 CMR 22.21(2). The Board of Health has adopted protection regulations that encompass the Aquifer Protection District in town that includes the Zone II areas. The Board of Health reportedly will be considering a floor drain regulation and some language modifications to existing regulations to comply with 310 CMR 22.000. The District does not have a protection plan although they have many of the components in place, such as a plan for land acquisition which it has executed to protect land critical to the recharge areas. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan can coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

It should be noted that activities within the Zone III may also pose a potential threat to the water supply. Specifically, the Jabish Brook contributes water to the aquifer and wells and when the brook contributes water to the aquifer, an accidental release to the brook may pose a threat to water quality. This report

does not include facilities located upgradient of the wells along the Jabish Brook.

#### **Protection Planning Recommendations:**

- ✓ Consider preparing a Wellhead Protection Plan. Establish a protection team that includes participants from the Town of Belchertown and the Belchertown Water District, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Work with and encourage the Board of Health to investigate land uses that may pose a potential threat to the water quality within the aquifer and along Jabish Brook.
- ✓? Work with emergency responders to be sure the District is notified of a release to Jabish Brook within the Zone II or Zone III.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply. Other land uses and activities within the Zone II are listed in Table 2.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Proactively pursuing land acquisition and protection options in the Zone I,
- Maintaining detailed knowledge of activities within the protection areas,
- Efforts to work with land owners to control activities in the Zone II.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I areas regularly and when feasible remove activities not related to the water supply.
- ✓ Educate residents on ways they can help you to protect drinking water sources.

- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage, (particularly along Bardwell Road and Barrett Road) in your Zone II and to contact the District when responding to spills or accidents within the Zone II.
- ✓ Consider inventorying USTs within the Zone II.
- ✓ Continue working with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies. Encourage the use of BMPs on hobby farms.
- ✓ Develop and implement a Wellhead Protection Plan and include Belchertown in source protection efforts.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. When funds are available, the Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Each spring, if funds are available, DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection area. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

### **A. Protection Recommendations and Additional Documents on Source Protection**

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction or ownership to acquire additional land for protection.
Is the Zone I posted with "Public Drinking Water Supply" signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue to keep other land uses out of the Zone Is. Continue working with land owners to negotiate a CR, MOU and other forms of protection as is practical.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	Although the Town of Belchertown has bylaws and health regulations protecting the aquifers in town, they are not fully in compliance with 310 CMR 22.000. The Department has been in contact with the Belchertown Health Agent who has indicate that the Board will be considering the changes to the regulation sometime this fall or winter. Keep up contact with the Board to offer assistance in this matter.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Consider developing a plan and include strategies for future source development and protection. Refer to "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . Include Belchertown officials in the plan development and implementation.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Continue to work with the Fire Department, Board of Health, DPW, and local and state emergency officials.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at residential and agricultural uses within the Zone II and as appropriate Zone III.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Three Rivers Fire District**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Three Rivers Fire District
<i>PWS Address</i>	2031 Main Street, P.O. Box 182
<i>City/Town</i>	Palmer
<i>PWS ID Number</i>	1227003
<i>Local Contact</i>	John Sasur
<i>Phone Number</i>	(413) 283-9284

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

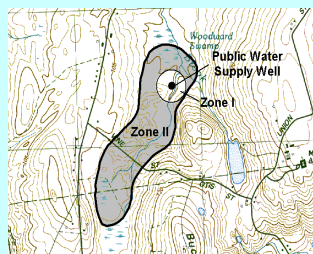
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**Zone II #: 465**

**Susceptibility: High**

Well Names	Source IDs
Well #1	1227003-01G
Well #3	1227003-03G

Three Rivers is a village within the town of Palmer Massachusetts, a medium sized community in south central, Massachusetts. Palmer, established in the early 1700's, initially developed as an industrial community along the numerous brooks and rivers that flow through the area. Palmer consists of the villages of Bondsville, Three Rivers, Whipples, Thorndike and Palmer. The Swift River flows into the Ware River and the Ware and Quabaug Rivers join to form the Chicopee River. The area east of the confluence is known as Three Rivers.

There are four community public water supply systems in Palmer: Thorndike, Palmer, Bondsville and Three Rivers Fire Districts. The Bondsville District currently supplies water to the Thorndike system with the Three Rivers District supplying a portion due to previous water quality problems with the Thorndike Fire District's source. Three Rivers Fire District maintains two active water supply wells 01G and 03G. The wells are located approximately 1,200 feet apart, immediately south of the Ware River. Both are gravel packed wells constructed in an unconfined sand and gravel aquifer. The wells for Three Rivers Water District are located within the same hydrogeologic regime and are within the same Zone II contribution area.

The wells are located in sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 before present. Streams and rivers have reworked the deposits and recent stream have deposited additional alluvial material. Boring logs and maps in the vicinity of the wells indicate medium to coarse sand, deposits approximately 45 to 85 feet in depth. There is no evidence of a confining clay layer. Under long duration pumping conditions, the river likely contributes water to the aquifer. The bedrock in the area is mapped as the Belchertown Complex, an igneous, quartz monzodiorite.

Each well has a Zone I radius of 400 feet and the Zone II was delineated as part of the SWAP program utilizing geological mapping and analytical modelling. Data for the analysis was gathered from extended duration pumping tests. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Sodium hydroxide is added to the water from both wells to raise the pH for corrosion control. The District has the capability of adding sodium hypochlorite as a disinfectant in the event of an emergency, however, it is not regularly added to the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Three Rivers is a mixture of forest, cropland, and residential, with a small portion commercial/light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

**Key Land Uses and Protection Issues include:**

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Agricultural activities
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Currently, Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The public water supplier does not own or control the entire Zone I for either of the wells. Only water supply activities are allowed in the Zone I. The river and a portion of a farm are within the Zone I, however, there is no active crop cultivation within the Zone I. Numerous water sources were developed prior to the 400-foot Zone I requirement and are therefore grandfathered. The Department encourages grandfathered systems to acquire ownership or control of the Zone I. The Three Rivers District has actively pursued methods of protecting and/or acquiring the Zone I land.

**Zone I Recommendations:**

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Continue your current efforts to purchase land and/or negotiate a conservation restriction for land within the Zone I.

**2. Residential Land Uses** – Approximately 25% of the Zone II consists of residential areas. Much of the area south of the river is served by public

sewers, however, some residential/rural areas use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

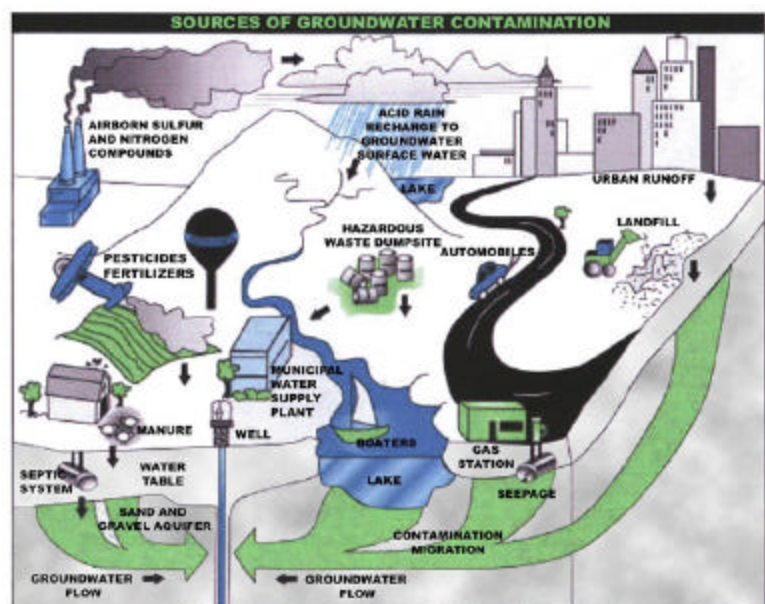
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Railroad tracks run through the Zone II. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

(Continued on page 6)

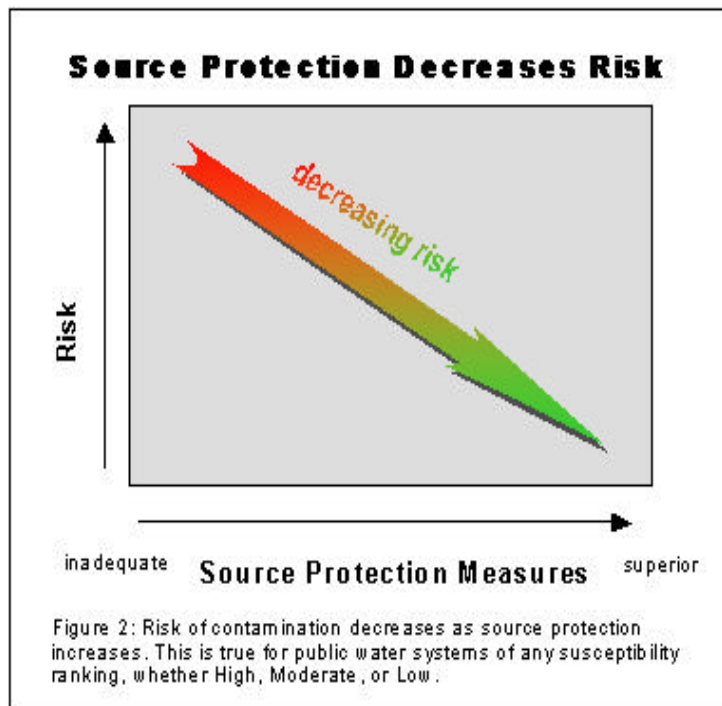
#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### **For More Information**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Commercial</b>			
Cemeteries	2	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Railroad Tracks And Yards	1	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	1	M	Materials stored in tanks: spills, leaks, or improper handling
Combined Sewer Overflows	3	L	Microbial and non-microbial contaminants including industrial wastewater; improper disposal of hazardous wastes
Schools	3	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	1	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Several	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	2	H	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling



**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.
- 4.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**4. Agricultural Activities** – There are several farms throughout the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resource Conservation Service farm plan to protect water supplies.
- ✓ Work with the Department to negotiate Conservation Restrictions as appropriate.

**5. Protection Planning** – Currently, the Town has water supply protection controls, but they do not meet the minimum requirements of the Department's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells. The Department recognizes the difficulty for one of four water supply districts to work independently to achieve comprehensive source protection.

It should be noted that activities within the Zone III may pose a potential threat to the water supply. Specifically, under conditions when the river contributes water to the aquifer an accidental release to the river may pose a threat to water quality. This report does not include facilities located upgradient of the wells along the Ware River.

**Protection Planning Recommendations:**

- ✓ Consider the fiscal and practical aspects of consolidating the Districts. It is our understanding that a feasibility study has been conducted to consider combining Districts. The Department endorses and encourages consolidation of systems when it will result in improved compliance and customer service, lower costs, and broaden rate options. The Department will assist the Districts if all or some of the Districts wish to consolidate.
- ✓ Inventory facilities upstream within, the Zone III, and incorporate any potentially high threat facilities into your Emergency Response Action Plan.
- ✓ Keep your Wellhead Protection Plan up to date. Meet with your protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Local controls do not regulate floordrains; work with the Board of Health to adopt floordrain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Requiring residential UST owners to register their UST in order to fill it.
- Pursuing funds to aid homeowners in replacing or upgrading older USTs.
- Successfully acquiring grant funds to study upstream land uses and prepare emergency response plan for addressing potential upstream impacts.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Work with the Department to acquire a Conservation Restriction for the Zone I area not currently owned by the District.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials. Since the wells can induce recharge from the river, include those businesses in the Zone III along the river.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

#### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



- ✓ Develop and implement a Wellhead Protection Plan. Work with the other water suppliers in Palmer to present a joint effort within Town.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction and other forms of protection.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue to keep other land uses out of the Zone Is. Continue working with land owners to negotiate a Conservation Restriction and other forms of protection.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>Partial</b>	Palmer does have controls in place, however the Zone II area must be modified and some language in the by law should be revised to meet DEP's requirements for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> and Zone II report.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NA</b>	Zone II is completely within the Town of Palmer. However, under stressed conditions, the river can contribute water to the aquifer, therefore activities within the Zone III should be monitored and Emergency Response Plans should include upstream land uses .
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	When updating plan, follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . The four water departments/districts in the community should work together in water supply protection efforts. Plans should include consolidation and redundancy options.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>NO</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>PARTIAL</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> Work with neighboring communities to adopt floor drain regulations and work with industries to protect water supplies.
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II and as appropriate Zone III.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
331161	Pathfinder Regional High School	240 Sykes St.	Palmer	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste, Waste Oil, or PCBs	Educational
363363	Public Petroleum	2394 Main St.	Palmer	Fuel Dispenser	Fuel Dispenser	Petroleum Distribution
				Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs	Petroleum Distribution

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000247	RTE 181 MAIN ST	Palmer	Oil or Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
PERU ROADSIDE SPRING



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Peru Roadside Spring
<i>PWS Address</i>	East Main Rd
<i>City/Town</i>	Peru, Massachusetts
<i>PWS ID Number</i>	1233003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>Zone II</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1 Spring	1233003-01G	136	Refer to the map	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and a Contribution Area or Zone II. The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The Contribution Area is the larger area that is likely to contribute water to the spring. Refer to **Figure 1** on page 2 for an example of a Zone I and Contribution Area.

The Contribution Area of Zone II is the primary recharge area for the aquifer and the spring source. This area was defined by a hydrogeologic study conducted for the MA DEP SWAP program by the USGS. The Zone II was approved by DEP. Refer to the attached map to determine the land within your Zone II.

## What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Contribution Area (Zone II). Please see the enclosed map for your well's Zone I and Zone II areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

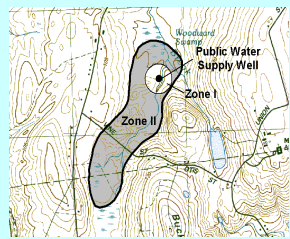
Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source Protection  
Area for WELL #1 SPRING  
(1233003-01G)**

Zone I = 136 ft.  
Refer to map for the  
Contribution Area

## What is a Protection Area?

A spring's water supply protection area is the land around the spring where protection activities should be focused. Each spring has a Zone I protective area and a contribution area (Zone II).



## How Was My Well's Susceptibility Determined?

Your spring's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the contribution area. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the Zone I and the contribution area.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

## Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





## Source Water Assessment Program (SWAP) Report For Harvard School of Forestry

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 26, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Harvard School of Forestry
<b>PWS Address</b>	324 North Main Street
<b>City/Town</b>	Petersham, Massachusetts
<b>PWS ID Number</b>	2234001
<b>Local Contact</b>	Edith Ellen
<b>Phone Number</b>	(978) 724-3302

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	2234001-01G	168	464	Moderate
Well #2	2234001-02G	168	464	Moderate

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

The facility gets its water supply from two wells. The primary source, Well #1, is a 750 foot deep rock well, and the backup well, Well #2, is a dug well. Well #1 is located indoors. Each well has a Zone I of 168 feet and an Interim Wellhead Protection Area (IWPA) of 464 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The wells serving the facility have no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website [www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) with Heating Oil;**
3. **Septic systems;**
4. **Vehicle maintenance; and**
5. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of only low and moderate threat land use or activity in the IWPA's, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone Is contain buildings, roads, and parking areas. The public water system owns and controls all land encompassed by the Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
  - ✓ Do not use or store road salt within the Zone I.
2. **Aboveground Storage Tank (AST)** – In 1990, all the underground storage tanks were removed and replaced with four 275 gallon ASTs. The tanks are in secondary containment, equipped with monitoring devices, and have an emergency plan in place. If managed improperly, Aboveground Storage Tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Both wells	Both wells	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	No	Both wells	Moderate	Tanks in secondary containment
Septic System	No	Both wells	Moderate	See septic systems brochure in the appendix
Vehicle maintenance area	Both wells	Both wells	Moderate	Use of oils and degreaser
Dairy operation	No	Both wells	Moderate	Three cows
Stormwater drains	Both wells	Both wells	Low	
Structures	Both wells	Both wells	-	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### Recommendation:

- ✓ Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

- 3. Septic system** – Septic systems belonging to the facility and some belonging to neighbors lie within the IWPA of both wells. If a septic system fails or is not properly maintained it could be a potential source of microbial and nitrate contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ The neighbor should be made aware of the location of the source of drinking water.

- 4. Vehicle maintenance/Storage of hazardous chemicals** – The ground floor of the resource center building is used for vehicle maintenance. The floor is cemented and is in good shape, and there are no floor drains. Five to ten gallon containers for chainsaw oils, gas, diesel are stored in a locked yellow safety cabinet. A sign is posted. Used oil is collected and disposed of at the town recycling fuel unit. Hazardous fluids are collected in 55 gallon drums and hauled away by a licensed hauler.

### Recommendation:

- ✓ Continue routine maintenance, and documentation of this responsibility to ensure its continuation in case of staff turnover.

- 5. Storm Water Catch Basin** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks,

### Recommendation:

- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Harvard School of Forestry should review and adopt the key recommendations above and the following:

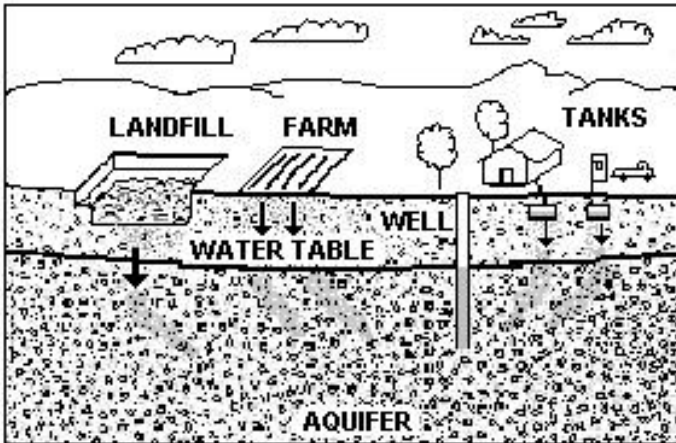


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 4030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ If Harvard School of Forestry intends to continue utilizing the structures in the Zone Is, use BMPs and restrict activities that could pose a threat to the water supply.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Eliminate any non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.

### Planning:

- ✓ Work with local officials in Petersham to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure



## Source Water Assessment Program (SWAP) Report For Petersham Sisters of the Assumption

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 26, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Petersham Sisters of the Assumption
<b>PWS Address</b>	211 North Main Street
<b>City/Town</b>	Petersham, Massachusetts
<b>PWS ID Number</b>	2234003
<b>Local Contact</b>	Robert Goodfellow
<b>Phone Number</b>	(978) 724-3468

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	2234003-01G	227	556	Moderate

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

The well for the facility is located near the rear of the building, protected within a pit and covered. The well has a Zone I of 227 feet and an Interim Wellhead Protection Area (IWPA) of 556 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. For current information on monitoring results and treatment and a copy of the most recent Consumer Confidence Report, please contact the Public Water System contact person listed above



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) With Heating Oil;**
3. **Agricultural land use; and**
4. **Septic system.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of all moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I**– Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the on-site buildings and access road onto the property. The public water supplier owns and controls all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
  - ✓ Do not use or store road salt within the Zone I.
2. **Aboveground Storage Tank (AST)** – There are four AST located on cement pads and walled, in the cellar. The ASTs are piped from the top to prevent leakage. The modifications were made a few years ago to incorporate proper containment and safety practices. If managed improperly, Aboveground Storage Tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

### Recommendations:

- ✓ Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveway	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	Yes	Yes	Moderate	Tanks are contained
Agricultural land use	No	Yes	Moderate	Fertilizer & Pesticide use
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Structures	Yes	Yes	-	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

local fire department for any additional local code requirements regarding ASTs.

- 3. Agricultural land use** - A farm is located within the IWPA of the well. If improperly stored or applied, the contaminants of concern are pesticides and fertilizers that are applied on the cropland.

**Recommendations:**

- ✓ Consider obtaining a conservation restriction for any agricultural land. Another option is to negotiate a "Memorandum of Understanding" (MOU) with the farmer to refrain from using pesticides and fertilizers and eliminate manure storage within the IWPA.
- ✓ Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing manure management issues.

- 4. Septic system** – The septic system is located within the IWPA. The on-site sewage treatment is composed of two 15,000 gallon concrete tanks, and is pumped annually. If improperly used or maintained, septic systems are a potential source of contamination in groundwater and the water supply.

**Recommendations:**

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Residents and maintenance staff should be trained on proper disposal of spent household chemicals and encouraged to participate in local Household Hazardous waste collections.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Sisters of the Assumption should review and adopt the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Since the on-site building, which is in use, lies within the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste the well and is treated according to DEP guidance.

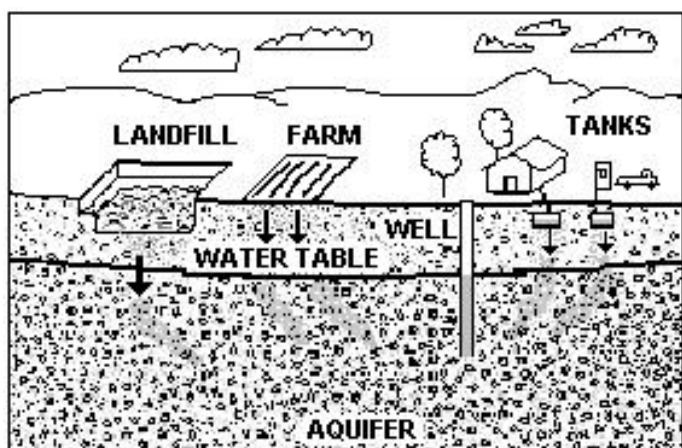


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 792-7650 x 5030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet



# Source Water Assessment Program (SWAP) Report For Petersham Center School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 26, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	PETERSHAM CENTER SCHOOL
<b>PWS Address</b>	P.O. BOX 148
<b>City/Town</b>	PETERSHAM, MASSACHUSETTS
<b>PWS ID Number</b>	2234006
<b>Local Contact</b>	ANN DEGNAN
<b>Phone Number</b>	(978) 724-3363

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	2234006-01G	100	409	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for the facility is located in a covered pit behind the school building. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 409 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Inappropriate Activities in Zone I; and**
2. **An Aboveground Storage Tanks (AST) with Heating Oil; and**
3. **Septic system**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the school building, playing field, access road to the school, and parking areas. The playing field is mowed, no fertilizer application is allowed. The public water supplier does not own and/or control all land encompassed by the Zone I. The Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- V Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
  - V Do not use road salt within the Zone I.
2. **Aboveground Storage Tank (AST)** – Four 275 gallon AST are located in the basement of the school building. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot and access road	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Fuel Storage Above Ground	Yes	Yes	Moderate	Should be on an impervious surface
Structures	Yes	Yes	-	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Aboveground storage tanks in your Zone I and IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Septic system** - The septic system is located within the IWPA of the well. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

## Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Petersham Center School should review and adopt the key recommendations above and the following:

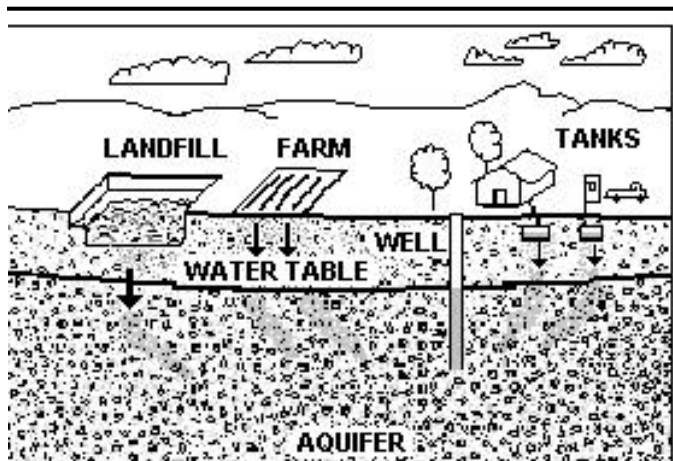


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ If the school intends to continue utilizing the structures, parking areas, and playing field in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Do not use road salt within the Zone I.

## Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.



### For More Information:

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at (508) 792-7650 x 5030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.htm](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.htm).

### Planning:

- ✓ Work with local officials in Petersham to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form





**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**for**  
**Pittsfield Department of Public Utilities**  
**Water Department**

### **What is SWAP?**

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### **Susceptibility and Water Quality**

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Pittsfield Department of Public Utilities Water Department
<i><b>PWS Address</b></i>	70 Allen Street
<i><b>City/Town</b></i>	Pittsfield
<i><b>PWS ID Number</b></i>	1236000
<i><b>Local Contact</b></i>	Mr. Bruce Collingswood
<i><b>Phone Number</b></i>	413-499-9330

### **Introduction**

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### **Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

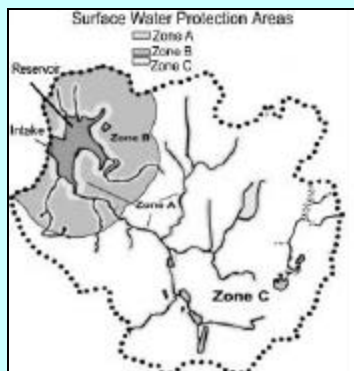
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### **This report includes the following sections:**

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

**System Susceptibility:**

**High**

**Source Name:**

**Source ID**

**Susceptibility:**

Cleveland Reservoir	1236000-06S	High
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### Ashley Reservoir System

Ashley Lake Reservoir	1236000-01S	High
Farnham Reservoir	1236000-02S	High
Sackett Brook Reservoir	1236000-04S	High
Sandwash Reservoir	1236000-07S	High
Ashley Reservoir Plant	1236000-03S	High

Pittsfield Department of Public Utilities, Water Department maintains and operates six surface water sources and two water treatment facilities for their drinking water supply. The Cleveland Reservoir (1236000-06S) supplies the majority of the City's demand yielding approximately 7.5 million gallons per day. Flow from the Windsor and Cady Brooks are also diverted into the Cleveland Reservoir watershed. Water from the Cleveland Reservoir is filtered, pH adjusted for corrosion control and disinfected at the Cleveland Water Treatment Plant. The Ashley Reservoir System includes five reservoirs. Ashley Lake Reservoir (01S) flows through Ashley Brook to the Ashley Intake Reservoir (03S). Water from the Sandwash Reservoir (07S) flows through an aerator, an open canal and then through a semi-closed aqueduct to the Farnham Reservoir (02S). Water from the Farnham Reservoir flows to the Ashley Intake structure then to the Ashley Water Treatment Plant. Water from the Sackett Brook Reservoir (04S), also flows via an aqueduct to the Ashley Intake structure then to the Ashley Treatment Plant. The Ashley Water Treatment Plant is exactly the same as the Cleveland Treatment Plant; water is filtered, pH adjusted for corrosion control and disinfected prior to distribution.

The watersheds for Pittsfield's reservoirs are located in the towns of Hinsdale, Windsor, Peru and Washington. The watersheds for the Ashley Reservoir System consist of approximately >90% protected open space. Approximately 60% of the watershed for the Cleveland Reservoir is designated as "protected open space" however, the City owns only 8% of the watershed. The protected open space designation on the SWAP map includes land owned by Pittsfield but also includes state forest land as well as other land held under various types of conservation restrictions. So although the land appears on the map as "protected", these lands are not under the control of the Water Department. Please refer to the attached map to view the boundaries of the protective zones.

As noted, all water from the reservoirs is treated through one or the other water treatment plants where the processes consist of chemical addition, flocculation, dissolved air flotation, and filtration. The water is pH adjusted and chlorinated for disinfection prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies, the sources are considered highly vulnerable to potential contamination. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Residential land use in Zone A and watershed
2. Transportation corridors (legal and illegal)
3. Forestry/Watershed Management
4. Protection Planning
5. Utility Line Right of Way

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Residential Land Uses** – Approximately 9.1 acres of the Zone A and watershed consists of residential areas in the Farnham and Sandwash Reservoirs, 19.5 acres in the Cleveland Reservoir watershed with addition acreage in the Windsor and Cady Brook watersheds in the Town of Windsor. None of the areas have public sewers, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they may be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of

chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

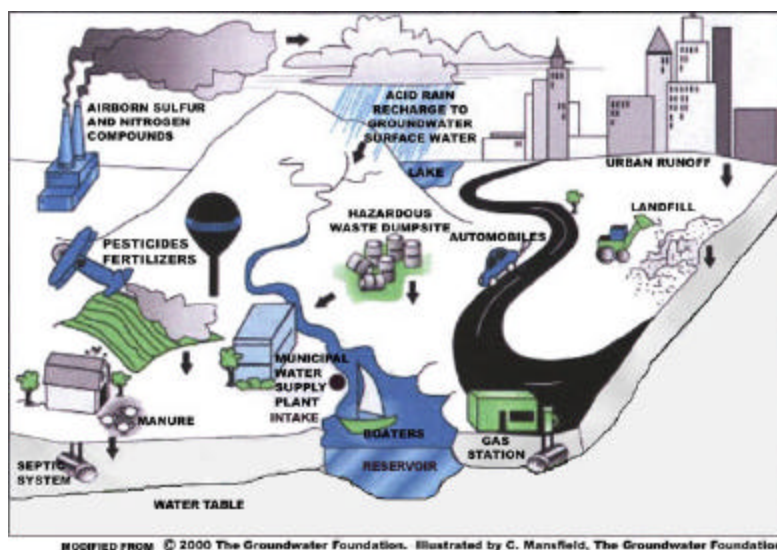


Figure 1: Sample watershed with examples of potential sources of contamination

leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Contact the Boards of Health and Selectmen in Washington, Windsor and Hinsdale to supply them with technical assistance
- ✓ Consider negotiating a Right of First Refusal agreement or conservation restrictions for land not currently owned by the Pittsfield.

**2. Transportation Corridors** – There are many local roads located throughout the watersheds of the reservoirs, including many that are dirt roads. A section of State Route 9 in Windsor runs through the Zone A along Windsor Brook. Though most roadways are low-use, due to the close proximity of some of the roads to the reservoirs, even typical roadway maintenance and use pose a potentially significant source of contamination from accidents and washouts along the dirt road. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater washed and discharge into the reservoirs. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the reservoirs. Additionally, illegal dumping is evident along some of the roads accessible by street vehicles. Clandestine dumping is identified as a significant threat to the water supplies.

There are numerous unpaved, ways as well as legal (authorized) and illegal (unauthorized) trails throughout the watersheds. Most of these roads and trails are not maintained at all or are minimally maintained. The resulting erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, potentially resulting in additional water treatment costs if they continue unchecked. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Access to the reservoirs was observed and anecdotal information indicates

evidence of camping near the reservoirs and throughout the watersheds. Unmanaged access may result in vandalism, illegal dumping and access to the reservoir resulting in water quality impairment.

The Berkshire Regional Planning Commission prepared a watershed management plan to address stormwater management and erosion control on City property and throughout the watershed. The BRPC prepared an inventory of the existing conditions within the watershed and determined numerous areas of uncontrolled access and erosion problems.

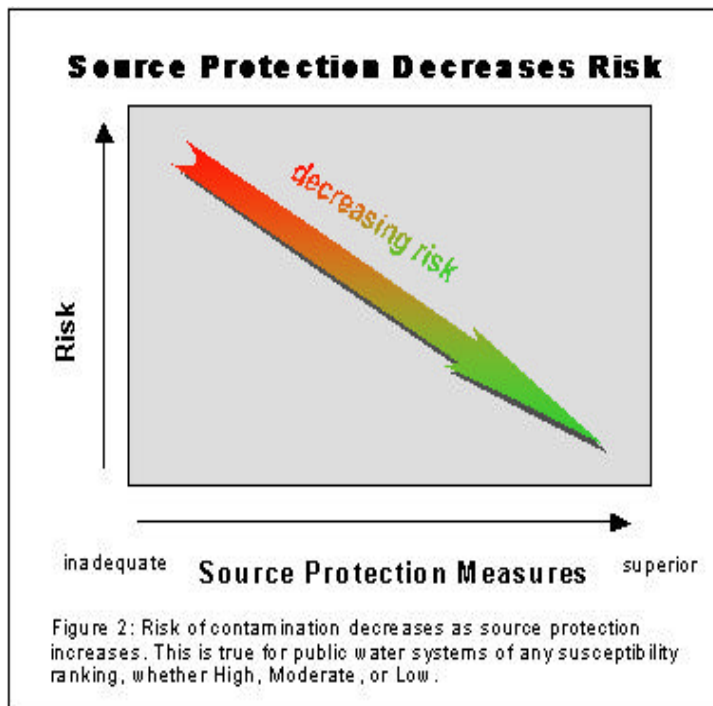
#### **Transportation Corridor Recommendations:**

- ✓ Investigate disposition of all roads, ways and “trails”.
- ✓ Increase patrols of watershed land and enforce no trespassing.
- ✓ Evaluate all options for management of access to ways. Include evaluation of continuing current practice of full access, closing roads to all traffic, closing road to all commercial traffic and limiting access only to residents



#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Source	Potential Contaminant Sources*
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	M	06S, 07S	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	06S, 07S	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	06S, 07S	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Aquatic Wildlife	Actively managed	M	All	Microbial and organic contaminants
Clandestine Dumping	Historical	H	All	Debris containing hazardous materials or wastes
Stormwater Drains/ Retention Basins	Numerous	L	07S, 02S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: <u>Electric</u>	1	L	06S	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors including trails (legal and illegal)	Numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. Erosion and illegal access to water.
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				



with a locked gate and key for residents only. The Towns of Washington, Becket, Hinsdale and Windsor must be partners in these strategies once the disposition of the roads is determined. Communicate with Selectmen or the State (for old county roads) regarding abandonment, control and other access issues for town roads.

- ✓ Evaluate stormwater drainage along the many local roads in the watershed. Specifically, Frank Schnopps, Stonehouse and Main Dalton Roads in the Cleveland reservoir watershed; and the Kirchner/Pittsfield Road along Sackett Reservoir; and the Lenox/Whitney Road at the Farnham Reservoir. Consider various strategies to detain/slow the flow, redirect runoff out of the watershed or retain/detain sediments from roads within the watershed. Since these roads are in neighboring communities, the City should foster a relationship to work with the communities to evaluate and mediate stormwater threats identified within the watershed. Coordinate efforts for work and cost sharing with the Dalton Fire District and the Town of Windsor on issues within the Windsor/Cady Brook watersheds.
- ✓ Inspect, maintain, and clean catch basins or BMPs on a regular schedule.
- ✓ Evaluate existing conditions throughout the watershed with respect to current illegal use of watershed land. Determine where access is being gained and what are the destination points. Develop a strategy, management plan, to eliminate or control access. Coordinate with the host communities for management strategies.
- ✓ Work with local emergency response teams to ensure effective management of potential spills.
- ✓ Contact MA DEM regarding uncontrolled and advertised access to abutting DEM land to develop an effective strategy to eliminate, control and/or manage access as appropriate through the watershed especially in areas proximal to the Zone As. Request an access and management plan for all lands within the Pittsfield watershed. Request an access and management plan for all lands within the Pittsfield watershed and require BMPs.

**3. Forestry/Watershed Management** – The majority of the watershed is not currently managed, but there is a potential for this practice to occur in the future. There is no watershed/forest management plan at this time. Logging in a forest

#### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

without a well-designed plan may result in poor water quality and an unhealthy forest. However, with the use of a properly designed watershed, forest management plan and the enforced use of BMPs, forest management may enhance the water production and quality of the raw water. Higher quality raw water results in reduced treatment cost. Unmanaged forests may result in an even aged forest that is susceptible to fires and disease. Aquatic wildlife such as beavers or muskrats, are currently being managed in the watershed on an as needed basis.

#### Forestry/Watershed Management Recommendations:

- ✓ Prepare a water supply, watershed management plan and include in the plan, an evaluation of the need for a forest inventory and forest management plan specifically designed for water supply management. Consider management strategy of forest roads that may exacerbate public access issues.
- ✓ Evaluate whether there are impacts associated with access and determine what if any, management strategies are required for public access to the watershed.
- ✓ Continue to inspect the watershed regularly.

**4. Protection Planning** – A Watershed Protection Plan has not been prepared and submitted for approval by the Department's Boston office for content and procedures. These types of protection plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public education and outreach. The development of a successful Watershed Protection Plan is outlined in DEP's "Developing a Local Watershed



Protection Plan” (see Appendix A for the full report). Currently, the host communities of Windsor, Hinsdale and Washington do not have Watershed Protection Districts or Bylaws although the majority of the watersheds are currently “protected” land.

**Protection Planning Recommendations:**

- ✓ Develop a Watershed Protection Plan. Watershed access, forest management and roads and dirt roads maintenance should be addressed, especially at brook crossing and proximal to the reservoirs. Establish a protection team, and utilize <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Watershed Protection Plan”. Include the MA DEM and official from the Dalton fire District, Windsor, Hinsdale, Washington and Becket in your strategy for access and stormwater management.
- ✓ Coordinate efforts with local officials to compare local watershed protection controls with current MA Watershed Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

**5. Utility Line Right-of-Way** – Electric utility lines run through the entire watershed of Cleveland Reservoir and directly over the reservoir. Normal maintenance of a right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on railroad right-of-way is a potential source of contamination. Leaks or spills of chemicals used for maintenance of the line are also potential sources of contamination to the water supply.

**Right of Way Recommendations:**

- ✓ Review the right-of-way Yearly Operating Plan from both the electric company to ensure Best Management Practices are implemented with regard to vegetation control in the Zone A, and that the utility has accurate information regarding the locations of the Zone A. Review the maps the utility uses or supply them with accurate maps from your records.
- ✓ Work with the local fire department to review emergency response plans. Updates to this plan should include coordination with the owner/operator using the right-of-way. Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from accidents within the Zone A and watershed, which should attempt to include representatives from the owner/operator of the rights-of-way.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources.

Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

## **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system’s watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply

**For More Information**

Contact Catherine V. Skiba in DEP’s Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

Protection Areas through:

- Actively pursuing watershed protection through stormwater management. The City received a water supply protection grant to address runoff issues throughout the watershed.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the protection areas regularly, and when feasible, remove any non-water supply activities.
- ✓ Control access to the watersheds, through patrols, public education and controlling watershed access points.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the

- ✓ stormwater drainage in your watershed and to cooperate on responding to spills or accidents.
- ✓ Work with landowners in your protection areas to make them aware of your water supply and to encourage the use of a best management practices for residential and recreational uses.
- ✓ Consider supplementing the household hazardous waste collection efforts in the communities of Washington, Hinsdale, Windsor and Becket for residents living within the watershed.
- ✓ Develop and implement an access control strategy as part of the watershed management plan.
- ✓ Develop and implement Forest Management Plan for water supply protection.
- ✓ At a minimum, investigate disposition of roads and actively pursue stormwater management and access management on ways closest to the reservoirs and feeder streams.
- ✓ Request that the utility supply you directly with their maintenance plan. Provide the electric company an accurate map of the watershed and meet with their representative to ensure they are working with an accurate map.
- ✓ Actively pursue an agreement with DEM regarding uncontrolled access to the watershed.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring, about May 1, the Department posts a new Request for Response (RFR- the grant application form) for the grant program.

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone C. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with “Public Drinking Water Supply” Signs?	NO	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	YES	Continue inspections of drinking water protection areas. Increase frequency when possible. Investigate access controls.
Are water supply related activities the only activities within the Zone A?	YES	Continue monitoring non-water supply activities in Zone A and throughout watershed.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20 C?	NO	The Towns do not have watershed protection bylaws. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	N/A	Pittsfield or other agencies own most of watersheds in the other communities.
<b>Planning</b>		
Does the PWS have a local Surface Water Protection Plan?	NO	Develop a surface water protection plan. Include forest management, erosion controls and access control. Follow “Developing a Local Surface Water Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws.</a>
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	Partial	Create a plan by developing a joint emergency response plan with fire department, Board of Health, DPW, DEM and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	N/A	
Does the PWS provide watershed protection education?	NO	Aim education at schools, residential and municipal uses within the watershed.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
208618	Friendly Fred's Package Store	1173 Rte 9	Windsor	Fuel Distributors		Distribution
208656	Estes' General Store	1895 Rte 9	Windsor	Fuel Distributors		Distribution

\* Massachusetts Identification Number

\*\* EPA Identification Number

\*\*\* Scheduled to be cleaned up

### Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Estes General Store	1895 Route 9	Windsor	Convenience, Gas Station	1 Wall	Approved In Tank Monitor	4,000	Gasoline
				1 Wall	Approved In Tank Monitor	4,000	Gasoline
				1 Wall	Approved In Tank Monitor	4,000	Gasoline
Tyler Brook Inc. Friendly Fred's	Route 9	Windsor		1 Wall	Approved In-Tank Monitor	4,000	Gasoline
				1 Wall	Approved In-Tank Monitor	4,000	Diesel
				1 Wall	Approved In-Tank Monitor	2,000	Diesel
				2 Walls	Interstitial Monitoring	6,000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



# Source Water Assessment Program (SWAP) Report For DEM Berkshire Regional Headquarters

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 27, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>DEM Berkshire Regional Headquarters</b>
<b>PWS Address</b>	<b>740 South St., P.O. Box 1433</b>
<b>City/Town</b>	<b>Pittsfield, Massachusetts</b>
<b>PWS ID Number</b>	<b>1236016</b>
<b>Local Contact</b>	<b>Paul Adams</b>
<b>Phone Number</b>	<b>413-442-8928</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1236016-01G	100	414	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The DEM Berkshire Regional Headquarters, located in Pittsfield, serves approximately 30 employees year round. The system is served by on-site septic disposal located 200 feet from the well. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 100 feet and 414 feet, respectively based on estimated water use. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The well is reportedly drilled to a 400-foot depth with the pump set at 248-feet below grade. The facility is located within an area of bedrock that is mapped by USGS as the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- The IWPA is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Wallomsac Formation comprised primarily of dark-grey phyllite, schist and intrusive limestone. There is no surficial geology map available; however, based on the observed bedrock outcrops and topography at the site, it is assumed the surficial geology is a thin layer of till. There is no evidence of a confining, protective layer such as clay in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well water serving the facility is exposed to ultra-violet light for disinfection. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming activities in the Zone I;**
2. **Septic System; and**
3. **Floor drain in boiler room.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the Zone I or IWPA, as seen in Table 2.

**1. Nonconforming activities in the Zone I** – Currently, the water supplier does not own or control the entire Zone I area for the well. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. A portion of the Zone I is owned by the South Mountain Associates (SMA). In addition, the SMA owners have an easement that allows parking on the DEM land during the concert season that runs 5 or 6 Saturdays in the fall. There is also an interior transportation corridor located within the Zone I.

#### Recommendations:

- ✓ Continue to work with South Mountain Associates in an attempt to find alternative parking solutions.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or road salt within the Zone I.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Internal Transportation Corridors and Seasonal Parking	Well # 1	Well #1	Moderate	Monitor area for accidental leaks or spills
Septic System	No	Well #1	Moderate	See Septic System brochure
Floor drain in boiler room	No	Well #1	Moderate	Bring the floor drains into compliance with Department Regulations
Underground Storage Tank (UST) – Fuel oil	No	Well #1	High	New double-walled, 1000-gallon heating oil tank

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.

**2. Septic Tank** – Although the septic system and leach field for the facility are located outside of the Zone I and are topographically down gradient from the well, they are within the IWPA of the well. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

**Recommendations:**

- ✓ Provide staff and area residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Upgrade and maintain the facility's system as required.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**3. Floor drain in boiler room** – A floor drain is located in the boiler room, which discharges into the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be sealed, connected to a tight tank or as a last resort, protected to guarantee that boiler blow down, oil or other prohibited discharges cannot enter the floor drain.

**Recommendations:**

- ✓ Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
  - Interim Actions: cease using the floor drains.
- ✓ If you wish to retain the drain, install a tight tank and connect the boiler room floor drains to the tank.

Additionally, there is a 1000-gallon capacity, #2 fuel oil UST within the IWPA, located in the front yard, downhill from the facility and well. The tank is double-steel wall, installed two years ago. USTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the DEM Berkshire Regional Headquarters' well susceptibility to contamination. DEM Berkshire Regional Headquarters is commended for bringing the wellhead above grade, for upgrading the UST. DEM Berkshire Regional Headquarters should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- ✓ Keep non-water supply activities out of the Zone I as much as possible. Attempt to work out a compromise agreement for seasonal parking use.
- ✓ Address floor drains in boiler room.

**Zone I:**

- ✓ Prohibit public access to the well by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, etc.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

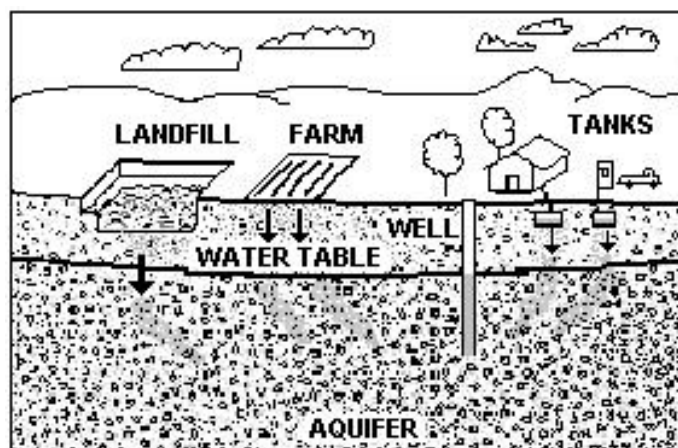


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ If water quality cannot be protected continue investigating other options for connecting to City water.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, seal the floor drain or discharge drains to a tight tank or sanitary sewer. (refer to attachment "Industrial Floor Drain Brochure").
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete or earthen collars around wellheads should slope away from well casing.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Pittsfield to include DEM Berkshire Regional Headquarters' IWPA in an Aquifer Protection District overlay and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For EARTHDANCE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 24, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Earthdance
<i>PWS Address</i>	252 Prospect St
<i>City/Town</i>	Plainfield, Massachusetts
<i>PWS ID Number</i>	1237003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1237003-01G	136	438	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

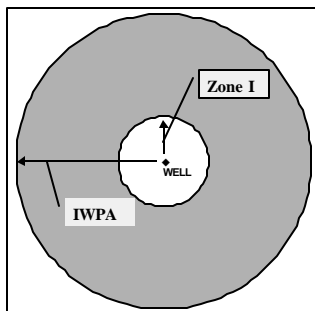
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1237003-01G)**

Zone I = 136 ft.  
IWPA = 438 ft.



### How Was My Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and/or the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads, parking and facility buildings within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Richmond Consolidated School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Richmond Consolidated School
<i>PWS Address</i>	State Road
<i>City/Town</i>	Richmond, Massachusetts
<i>PWS ID Number</i>	1249004
<i>Local Contact</i>	Mr. Bruce Garlow
<i>Phone Number</i>	413-698-3882

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1249004-02G	250	622	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

### The Well

Richmond Consolidated School is a rural, kindergarten through eighth grade school located on the east side of State Road, Route 41 in Richmond. The total school student and staff population is approximately 250 people per day and is served by a single potable supply well (Well #1 –02G) located northeast of the school. The school was expanded and renovated in 1999 and the school's old (01G) was abandoned as a water supply and decommissioned, by filling in and sealing the well in accordance with the DEP's requirements



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 has a Zone I protective radius of 250 feet and an Interim Wellhead Protection Area (IWPA) radius of 622 feet based on pumping test data and Zone I restrictions. The well was tested at a rate of 18 gallons per minute (gpm) under the New Source Approval Process and was granted an approved withdrawal rate of 10,000 gallons per day (7 gpm) due to a limited Zone I area of a 250-foot radius.

Well #1 is a 6-inch diameter well drilled to a depth of approximately 440 feet below ground. The driller's log states that topsoil was encountered from ground level to 3 feet below ground, where bedrock was encountered. The driller logged the bedrock as limestone from 3 feet to the final well depth; the geologic map of the area states that the bedrock is dolomite and marble of the Stockbridge Formation. Forty feet of casing was grouted into place with approximately 24-inches of casing above ground. At the time this report was prepared, the water does not require and is not treated. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Parking and Stormwater Retention Basin**
2. **Passive Recreation in IWPA**

The well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Parking and Stormwater Retention Basin in the IWPA** – The stormwater from the parking areas is discharged to a retention basin immediately adjacent to the Zone I. The discharge line was mounded, rather than buried, due to shallow bedrock and the retention basin is located on bedrock, with riprap. Storm water from the parking lot is routed through catch basins prior to discharge to the sediment trap/water quality basin. There are eight (8) catch basins and the building footing drain that discharge to the basin. Four (4) of those basins are located in the parking lot.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking and Storm water retention	No	Yes	Moderate	Manage, monitor and maintain system.
Passive Recreation	Yes	Yes	Low	Evidence of low frequency passive activity.

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

As flowing storm water travels, it picks up debris and contaminants from parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, or accidents.

Pollutants are actually not removed from most catch basins until they are cleaned out. Regular maintenance is required to reduce the risk of resuspension of sediments and contaminants during large storm events. Maintenance is essential for the proper operation of catch basins and the sediment/water quality basin. Due to the shallow bedrock contaminant discharged through the basin may impact the bedrock aquifer.

### Recommendations:

- ✓ If you do not have a storm water maintenance plan, develop one. Maintenance plans should include an inspection and maintenance schedule. Inlets should be cleaned out a minimum one time per year and inspected quarterly. The outfall should be inspected annually for structural integrity and determine if it needs to be cleaned. Look for color, turbidity, odor, oil sheen etc. All observations should be recorded and action taken if evidence of a release of hazardous materials such as petroleum products has been observed.
- ✓ Inspect parking areas periodically for evidence of leaks or accidental spills.
- ✓ Post Drinking Water supply signs in the parking areas.
- ✓ Sweeping parking lots reduces the amount of potential contaminants in stormwater runoff.
- ✓ All sediments and hydrocarbons should be properly handled and disposed in accordance with local, state and federal guidelines and regulations. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all DEP regulations, policies and guidance.

2. **Passive Recreation in IWPA** – Passive recreation occurs in the IWPA at a tennis court. Passive recreation poses minimal threat provided access to the wellhead is prevented.

### Recommendations:

- ✓ Conduct routine inspections of the wellhead and monitor for activities near the wellhead.
- ✓ If there is evidence of unauthorized access to the wellhead, consider fencing off the wellhead area. Fencing for the wellhead is an eligible project under the Wellhead Protection grant program. (See Funding below).

Other activities that were noted during the assessment were the open fields adjacent to the school. It is our understanding that these fields are hayed. Provided that no soil enhancements, manure or pesticides are applied, haying poses minimal threat to the aquifer. Any soil enhancements should be applied following a nutrient management plan prepared with assistance from the There is one residence in the northern section of the IWPA and low-density residential development west of Route 41. Normal residential activities pose minimal threat to the water quality of the public water supply as well as their own private supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and septic systems and they utilize best management practices.

Provide information to residents about the potential hazards of household chemicals, lawn care chemicals and fertilizers.

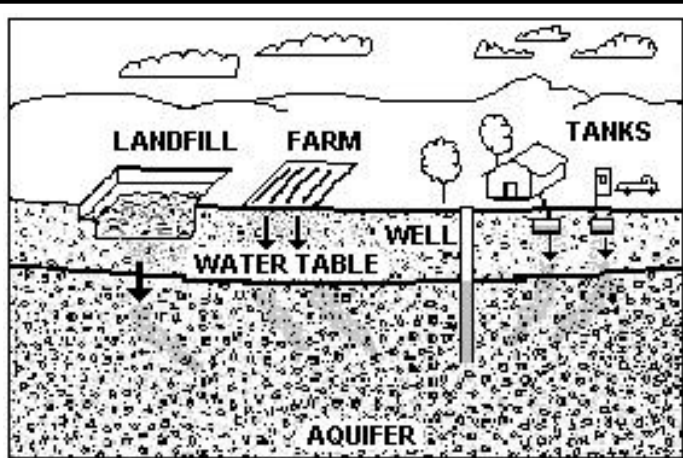


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

Include information on Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides, household hazardous waste and septic system maintenance and disposal practices.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Richmond Consolidated School is commended for current protection measures specifically those designed into the school renovations.

Please review and adopt the key recommendations listed above and as follows:

#### Priority Recommendation:

- ✓ If you do not have a storm water maintenance plan, work with the Town to develop one. Maintenance plans should include an inspection and maintenance schedule. Inlets should be cleaned out a minimum one time per year and inspected quarterly. The outfall should be inspected annually for structural integrity and determine if it needs to be cleaned. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all DEP regulations, policies and guidance. Look for color, turbidity, odor, oil sheen etc. All observations should be recorded and action taken if evidence of a release of hazardous materials such as petroleum products has been observed.

#### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the wellhead area. This is an eligible project for a Wellhead Protection grant.
- ✓ Post drinking water supply sign in the parking lots at the front and rear of the building.
- ✓ Provide information to residents about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Provide information on Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.
- ✓ Provide educational outreach to residents regarding septic system maintenance and disposal practices.

#### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations such as in the parking areas.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

#### Facilities Management:

- ✓ Work with the town or develop a storm water maintenance plan that includes an inspection and maintenance schedule. Inlets should be cleaned out a minimum one time per year and inspected quarterly. The outfall should be inspected annually for structural integrity and determine if it needs to be cleaned. Look for color, turbidity, odor, oil sheen etc. All observations should be recorded.
- ✓ Inspect parking areas periodically for evidence of leaks or accidental spills.
- ✓ Sweeping parking lots reduces the amount of potential contaminants in stormwater runoff.
- ✓ All sediments and hydrocarbons should be properly handled and disposed in accordance with local, state and federal guidelines and regulations. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in

accordance with all DEP regulations, policies and guidance.

- ✓ Septic system components should be inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete protective collars on the wellhead (earthen or concrete) should slope away from well and the well casing should extend above ground.

#### **Planning:**

- ✓ Encourage local officials in Richmond to develop protective bylaws and include the school well's IWPA in an Aquifer Protection District Bylaws and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Developing a Local Wellhead Protection Plan
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for View Drive Community

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
November 19, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>View Drive Community</b>
<i>PWS Address</i>	<b>View Drive</b>
<i>City/Town</i>	<b>Richmond, Massachusetts</b>
<i>PWS ID Number</i>	<b>1249008</b>
<i>Local Contact</i>	<b>Mr. Robert Yerkes</b>
<i>Phone Number</i>	<b>413-494-7562</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1249008-01G	223	547	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

View Drive Community is a residential development located in Richmond, a small rural, hilltown in western Berkshire County on the New York state border. The community consists of 20 homes on the western slope of Lenox Mountain. Richmond does not have municipal water and sewer systems, therefore, the community is served by one, on-site water supply well and wastewater is discharged through individual on-site septic systems.

Well #1 is a 6-inch diameter, 230-feet deep, bedrock well located on the side of Lenox

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Mountain, fairly remote from the homes adjacent to a trail. Water from the well is pumped to a storage tank lower on the hill. The geologic mapping of the area indicates thin overburden material of till with numerous exposures of bedrock. Geologic mapping also shows the well near the contact between the carbonate rocks of the valley and the metamorphic equivalents of the sedimentary and volcanic rocks of the Taconic Allochthon, predominantly a chloritoid-rich schist of the Everett Formation. It seems apparent that the well does not intersect the carbonate rocks, as the system must treat the water for corrosion control. The system has been conducting pilot studies to control the pH and has not established a treatment system yet.

The Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on an estimated volume from the well are 223 feet and 547 feet, respectively. The system does not have a master meter; therefore Title 5 flow estimates were used to determine the protection areas. Please refer to the attached map of the Zone I and IWPA.

There is no record or evidence of a continuous, confining and protective layer such as thick till or clay, in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The well is fairly remote and the protection areas include a hiking trail, forest and two residences on the edge of the IWPA.

#### Key issues include:

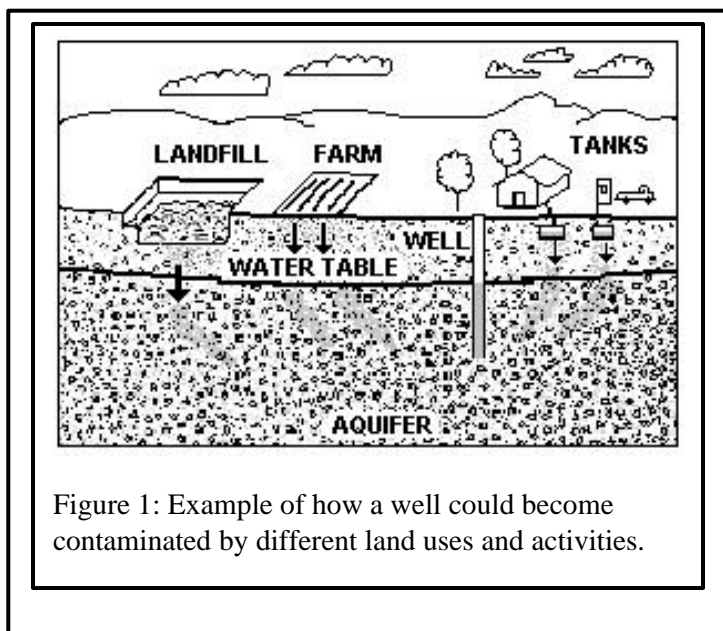
1. **Passive recreation**
2. **Residential land use**

The overall ranking of susceptibility to contamination for the View Drive Community

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Recreation	Yes	Yes	Low	Inspect the well regularly to ensure against tampering. Inspect the integrity of the cap and the drainage around the well.
Residential	No	Yes	Moderate	Supply BMPs to residents. Monitor activities within the entire IWPA area for potentially hazardous activities near your wells.

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



supply well is low/moderate based on the presence of only one low and one moderate ranked potentially threatening land use or activity in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

**1. Passive recreation within Zone I** – The Zone I is the area immediately surrounding the wellhead where only activities associated with supplying water or other non-threatening activities are allowed. The Zone I is fairly remote, however there is a hiking trail that traverses the Zone I.

**Zone I Recommendations:**

- ✓ Control access to the wellhead areas with sanitary seals and secure facilities.
- ✓ Inspect the well regularly to ensure the integrity of the cap and the drainage around the well.

**2. Residential Land Use** – There are two residences within the IWPA protection area. If managed improperly,

activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Do not allow the accumulation of refuse within the protection areas.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Department commends the Community for previous efforts to protect the source but there is still work needed to fully protect the sources. The water supplier should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- ✓ Monitor and control activities in the Zone I and IWPA areas.
- ✓ Consider ways to protect the well if activities cannot be controlled.

**Zone I:**

- ✓ Prohibit any new, non-water supply activities from the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect drainage in the Zone I, downgradient and away from the well area.

**Training and Education:**

- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate residents, neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.



### Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-feet to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Planning:

- ✓ Request that the town develop a Wellhead Protection District and associated bylaws and request that the IWPA for your and other water systems be included in the protection area.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Be sure that the local emergency responders know where your sources are located and notify you in the event of an accident in the vicinity of your well.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. Copies of this report have been forwarded to the water supplier and Town officials.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

- Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- MA DEP SWAP Strategy
- Land Use Pollution Potential Matrix
- Draft Land/Associated Contaminants Matrix

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection

## Source Water Assessment and Protection (SWAP) Report

### for Yankee Atomic Electric Company

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
October 24, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Yankee Atomic Electric Company</b>
<i>PWS Address</i>	<b>Yankee Road</b>
<i>City/Town</i>	<b>Rowe, Massachusetts</b>
<i>PWS ID Number</i>	<b>1253001</b>
<i>Local Contact</i>	<b>Mr. Kenneth Dow</b>
<i>Phone Number</i>	<b>413-424-5261</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #2	1253001-02G	200	504	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Yankee Atomic Electric Company's (Yankee Atomic) former nuclear power station is located in Rowe, a small, rural community in northwestern, Massachusetts along the Vermont border. The facility was a small nuclear power generation station, the third built in the country and the first in New England. The facility stopped generation in 1992 and is in the final stages of being decommissioned and dismantled; the anticipated date of completion is 2005. The current staff is approximately 200 people per day and the facility is served by a single potable supply well (02G) located at the facility. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

original well #1 (01G) was abandoned and decommissioned as part of the facility decommissioning process. Rowe does not have public water or municipal wastewater sewers available and therefore, the facility is served by an on-site water supply and septic disposal. Numerous local, state and federal programs regulate activities at the facility. Some of those regulatory programs are: the Massachusetts Department of Public Health radiation control program, and MA DEP air quality, solid waste, industrial wastewater, hazardous waste, water supply, wastewater, and waste site cleanup programs. In addition, the federal regulatory programs include, but are not limited to the National Pollution Discharge Elimination System (NPDES), the Nuclear Regulatory Commission (NRC), the Resource Conservation and Recovery Act (RCRA), and the Toxic Substance Control Act (TSCA).

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 200 feet and 504 feet, respectively, based on an approved withdrawal rate as determined through the New Source Approval Process.

The overburden in the area is comprised of glacially derived stratified drift and till of varying thickness (0 to 246 feet) over the bedrock; limited stratified drift and alluvium are deposited along the adjacent Deerfield River. The bedrock in the area is mapped as the Hoosac formation, a lower Cambrian age gneiss. Well 02G is approximately 280 feet deep, set into sound bedrock beneath 246 feet of glacial till. Although there is some evidence of a protective barrier of thick till, the confining unit is highly variable in the vicinity of the well, as bedrock exposure is noted at various locations on site. Therefore, the Department has determined this well to have a high vulnerability to contamination due to the absence of a continuous, hydrogeologic barrier throughout the recharge area that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is presently not treated prior to distribution. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Nuclear Power Plant (former, partially dismantled)	No	Yes	High	Radiological activities are controlled and regulated by NRC and DPH.
Hazardous materials storage and use	No	Yes	High	Continue the use of BMPs and coordinate with emergency responders.
LQG	No	Yes	High	Hazardous materials handling
Fuel storage (ASTs)	No	Yes	Moderate	Continue the use of BMPs and coordinate with emergency responders.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor and parking	No	Yes	Moderate	Ensure stormwater from the site is directed downgradient and away from the well.
Transmission lines	Yes	Yes	Low	Use only mechanical means of vegetation control.
Confirmed hazardous waste release site	No	Yes	--	Refer to MA DEP BWSC files for progress on remediation and Appendix C.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## 2. Discussion of Land Uses in the Protection Areas

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The Zone I protection area for Well #2 is in compliance with the DEP restrictions that allow only water supply related activities or other non-threatening activities to be conducted within the Zone I. However, the IWPA includes parts of the facility including hazardous materials storage and use, fuel storage (ASTs only), internal roads and parking, and radiological control and storage area. All site activities are immediately adjacent to the protection areas including solid waste (non-radiological) disposal areas, wastewater disposal, etc.

#### Key issues include:

##### 1. Hazardous materials storage and use.

The overall ranking of susceptibility to contamination for the Yankee Atomic water system is high, based on the presence of several moderate and high threat ranked land use or activity in the IWPA and immediately adjacent to the IWPA. Please refer to Table 2 for more details.

**1. Hazardous Materials Storage and Use** – Yankee Atomic utilizes and stores hazardous materials and generates hazardous waste. The Site Closure Project Plan, (Rev. 1, Oct. 20, 2003) addressed issues of compliance with local, state and federal requirements. Information regarding the observations and subsequent actions related to various closure issues are addressed in the recent update. At the time of the assessment, hazardous materials appeared to be handled appropriately. There is detailed documentation of procedures for handling of hazardous materials, both radiological and non-radiological. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. For details regarding compliance with the various MA DEP programs refer to the closure plan and the individual MA DEP program in the Springfield Regional office at (413) 784-1100.

#### Hazardous Materials Storage and Use Recommendations:

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to comply with all local, state, and federal regulatory requirements for restoration of the site.
- V Contact Rick Larson 413-2207 or Tony Zaharias 413-755-2122 with questions regarding the UIC program.
- V Refer to the following Yankee Atomic Electric Company web sites for additional information and for updated reports <http://www.yankee.com/siteclosure/index.htm> <http://www.yankee.com/> regarding the progress of the decommissioning.

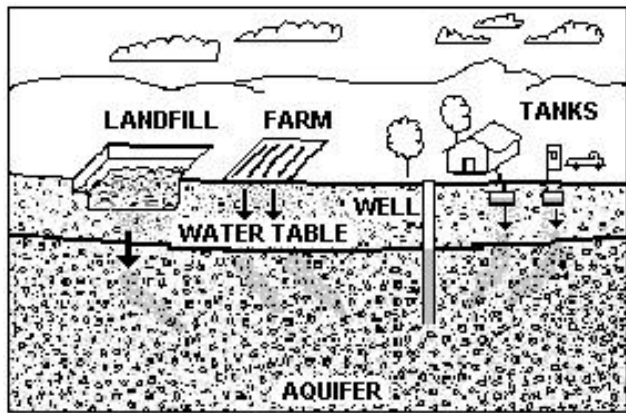


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

#### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.

#### Planning:

- ✓ Update the assessment as the dismantling and decommissioning progresses.
- ✓ Work with local officials in Rowe to develop an Aquifer Protection District and Bylaws for compliance with 310 CMR 22.000 to include your and other IWPAs in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Comply with all local, state and federal regulations for closure and site remediation.

#### Zone I:

- ✓ Prohibit any non-water supply activities from the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I. Inspect the well cap to ensure it is secure and the seal is intact.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets
- List of Regulated facilities in the protection areas

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Yankee Electric	Yankee Road	Rowe	Hazardous Waste Generator (Waste oil)	LQG	Power plant
				Hazardous Waste Generator (Hazardous waste)	LQG	Power plant
				Recycling	BUD	Solid Waste
				Air Quality	BLW-AQ	Air Emissions
				Solid Waste	LF	Solid waste
				Surface Water Discharges	SW	Stormwater and Process Water

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0013411	Yankee Atomic Electric	Rowe	Hazardous materials

For more location information, please see the attached map. The map lists the release sites by RTN.

W:\...\SWAP Docs\Rowe 1253001 SWAP 2003-11-25-03.doc



# Source Water Assessment Program (SWAP) Report for Rowe Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
September 21, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Rowe Elementary School
<i>PWS Address</i>	Pond Road
<i>City/Town</i>	Rowe, Massachusetts
<i>PWS ID Number</i>	1253007
<i>Local Contact</i>	Mr. Robert Clancey
<i>Phone Number</i>	413-339-8381

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1130002-01G	100	421	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Rowe Elementary School is a rural elementary school located on the west side of Pond Road. The school student and staff population is approximately 75 people per day and is served by a single potable supply well (Well #1) located northeast of the school. The well is located within a vault in the parking lot of the school. The pit is bermed and has a locking bilco type hatchway.

The well has a Zone I protective radius of 100 feet and an Interim Wellhead Protection Area (IWPA) radius of 421 feet based on an average maximum daily withdrawal rate from metered usage data. The protective radii were based on the average daily-metered

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

water use for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller.

The 6-inch diameter well is drilled to a depth of approximately 300 feet below ground. There is no record of the materials encountered during drilling of the well. Bedrock outcrops were observed in the vicinity of the school during the site visit indicating relatively shallow depth of bedrock. The geologic mapping of the area indicates till underlying the school with the bedrock identified as grey to green medium grained schist of the Moretown Formation dating from the Ordovician. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, very few land uses and activities within the drinking water supply protection areas were identified as potential sources of contamination.

### Key issues include:

1. **Underground fuel oil storage tank (UST)**
2. **Septic System**
3. **Floor drain in boiler room**
4. **Parking and roadway**

Although the Town owns the entire Zone I area, there are activities within Zone I that are not related to water supply. The well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration from the surface. The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank (UST, fuel oil)	No	Yes	High	Double walled tank with monitoring 135 feet from well
Septic System components	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Floor Drain in the boiler room to septic system	Yes	Yes	Moderate	Floor drain must be protected from accidental spills or connected to tight tank.
Parking area and roadway	Yes	Yes	Moderate	Grassy drainage swales in Zone I

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Underground fuel oil storage tank** – The school's underground fuel oil tank and propane tank are located within the IWPA of the school well. The oil tank is located 135 feet from the well and is double walled with a monitoring system. The propane tank, also located within the IWPA, poses a minimal threat to water quality due to the gaseous nature of propane if released.

### Recommendations:

- ✓ Diligently monitor the status of the tanks and the delivery of oil.
- ✓ Consider long term planning of replacing the UST after its useful life with an above ground tank with containment.

**2. Septic system components in the IWPA** - The septic tank, grease trap, pipeline and distribution box are all within the IWPA of the well. A very small portion of the leach field is also on the perimeter of the IWPA. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems or discharge from the boiler room are also potential sources of contamination to the water supply.

### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator.
- ✓ Refer to the appendices for more information regarding septic systems. The school is currently not registered as a generator of hazardous waste or waste oil. If you wish to participate in the Town household hazardous waste pick-up day, review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine regulatory requirements.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

**2. Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. Floor drains in an area that contains hazardous materials must be discharged to a sewer or a tight tank. The boiler room at the Rowe Elementary School has a floor drain that is assumed to discharge to the septic system.

### Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. A written policy and plan should be in place during maintenance operations, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.
- ✓ If protection of the floor drain cannot be assured, a tight tank must be installed for the floor drain.

**3. Parking and roadway** - The well is located within the school parking lot and the roadway is within the IWPA of the well. Parking lot and schoolyard drainage consists of an earthen swale. Drainage the school is discharged

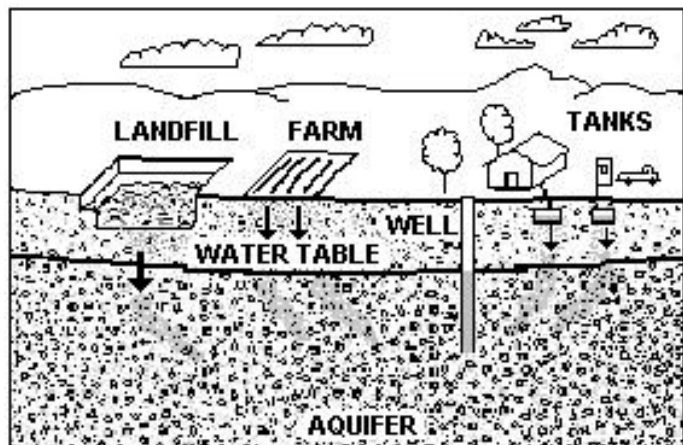


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

approximately 200 feet from the well to an area that topographically drains away from the wellhead.

#### Recommendations:

- ✓ Use minimal road salt and deicers.
- ✓ Monitor the parking lot for spills and leaks.
- ✓ Maintain a buffer from parking near the well.

Other land uses observed were the storage shed just outside the Zone I and the pole mounted power transformer approximately 75 feet from the well. Be sure to store all petroleum products in secondary containment and contact the power utility to ensure that the fluid in the transformer does not contain PCBs. Implementing the previously noted and following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Rowe Elementary School is commended for current protection measures.

Please review and adopt the key recommendations listed above and as follows:

#### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Monitor oil delivery and storage.
- ✓ Continue to prohibit parking immediately adjacent to the well vault and monitor the parking area for spills and leaks.
- ✓ Consider replacement of the well if Zone I threats cannot be mitigated.
- ✓ Post drinking water supply signs key location such along the access road to the school.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Do not use fertilizer or pesticides.
- ✓ Use Best Management Practices (BMPs) for household hazardous products.

#### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

#### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

#### Planning:

- ✓ Work with local officials to include the school well's IWPA in an Aquifer Protection District Bylaws and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands.

Keep the phone number of a bottled water company readily available.

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Grant Program Fact Sheet
- Source Protection Sign Order Form
- Very Small Quantity Generator (VSQG) information





**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**For**  
**South Royalston Improvement Corp.**

**What is SWAP?**

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

**SWAP and Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 23, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	South Royalston Improvement Corp.
<b>PWS Address</b>	7 Park Street
<b>City/Town</b>	Royalston, Massachusetts
<b>PWS ID Number</b>	2255000
<b>Local Contact</b>	Vickie Paine
<b>Phone Number</b>	(978) 249-8443

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	2255000-01G	323	1085	High

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes:**

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

**1. Description of the Water System**

The well for South Royalston Improvement Corporation is located adjacent to Blossom Street. The well is an eight-inch diameter bedrock that was drilled to a depth of 290 feet. The well has a Zone I of 323 feet and an Interim Wellhead Protection Area (IWPA) of 1085 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. The DEP requires public water

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Transportation Corridor**
3. **Railroad Tracks; and**
4. **Aquatic wildlife / Fishing and Boating.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains buildings, a home, roads, cemetery and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Remove non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
  - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
  - ✓ Use BMPs and restrict activities that could pose a threat to the water supply.
2. **Transportation Corridor** – Route 68 lies within the protection for the well. Highways are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Railroads Tracks	No	Yes	High	Spills of hazardous chemicals; pesticide use for vegetation control.
Transportation Corridor	Yes	Yes	Moderate	Spills, leaks and road salt
Utility Transformer	No	Yes	Low	Check for PCBs
Aquatic Wildlife/Fishing & Boating	Yes	Yes	Low	Millers River
Structures	Yes	Yes	-	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA is included in Emergency Response Planning

- 3. Railroad Tracks** – Gilford railroad lies within the IWPA of the well. Railroad corridors serving passenger and/or freight trains are potential contaminant sources due to chemicals released during normal use, track maintenance, and accidents. Normal maintenance of railroad rights of way can introduce contaminants to a water supply through improper herbicide application for vegetation control. Accidents can release spills or engine fluids and commercially transported chemical.

### Recommendations:

- ✓ Contact your local Board of Health to ensure that the IWPA is included in right of way pesticide management planning.
- ✓ Contact local fire department to ensure that the IWPA is included in Emergency Response Planning

- 4. Aquatic Wildlife/Fishing & Boating** - The Millers River is located within the IWPA. Ducks and other wildlife within and around the river are potential sources of microbial contamination to the water supply.

### Recommendation:

- ✓ Discourage wildlife by prohibiting the feeding of ducks and wildlife.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. South Royalston Improvement Corp. should review and adopt the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.

- ✓ Conduct regular inspections of the Zone I.
- ✓ Since owners intend to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include residents, groundskeepers, and certified operator.
- ✓ Post drinking water protection area signs at key visibility locations.

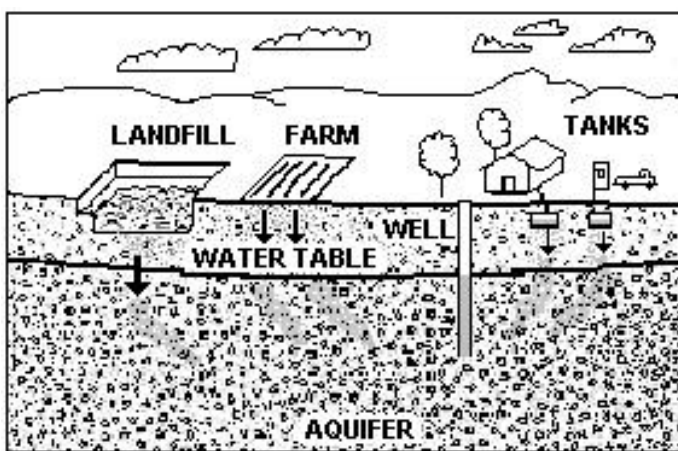


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 849-4030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Royalston to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

# Source Water Assessment Program (SWAP) Report For Village School/Raymond School



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 13, 2002

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	VILLAGE SCHOOL/ RAYMOND SCHOOL
<i>PWS Address</i>	ON THE COMMON
<i>City/Town</i>	ROYALSTON
<i>PWS ID Number</i>	2255001
<i>Local Contact</i>	Reise Richardson, School Director
<i>Phone Number</i>	(978) 249-3505

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	2255001-01G	100	420	High

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

## Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for the facility is located about 30 feet to the right of the building as you face the front of the building. The well is a deep rock well, and has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 420 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. Please refer to the attached map of the Zone I and IWPA.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above.

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate activities in Zone I; and**
2. **Aboveground Storage Tank (AST) with fuel oil.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of only moderate threat land use or activities in the IWPA.

1. **Zone I** - Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The school's Zone I contains a portion of the school building, a portion of the school's driveway, the playground and some parking spaces. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use road salt within the Zone I.
- ✓ If the school intends to continue utilizing the structures, athletic fields, and parking areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

2. **Aboveground Storage Tank** - A 250 gallon AST with fuel oil is located in the building on cement floor, without secondary containment. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

#### Recommendations:

- ✓ The Department recommends that you provide 110% secondary containment for the AST located in the school building. Aboveground storage tanks in your IWPA should be located on an impermeable surface.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Parking lot & driveways	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
	Aboveground Storage Tank	Yes	Yes	Moderate	AST on cement floor in building
	Structure	Yes	Yes	Moderate	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire department for any additional local code requirements regarding AST.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Village /Raymond School should review and adopt the following recommendations at the school:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated. Please note that DEP Permit Approvals must be obtained prior to the installation of a new well.

### Training and Education:

- ✓ Instruct staff on emergency response, and best management practices; include custodial staff, groundskeepers and certified operator.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum.

### Planning:

- ✓ Work with local officials in Royalston to include the school's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

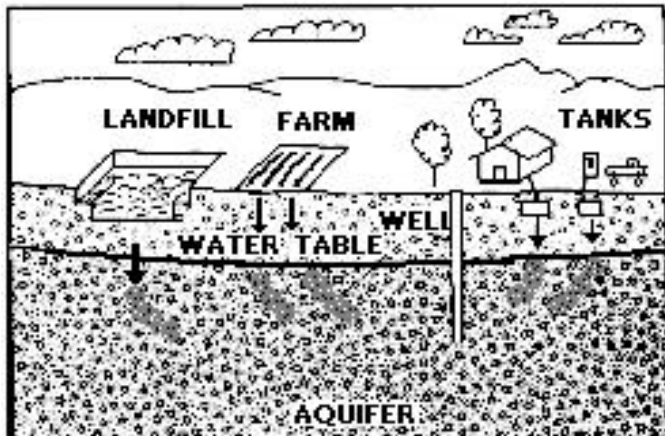


Figure 1: Example of how a well could become contaminated by different land uses and activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet

**For More Information:**

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 4030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water department and town boards.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

# Source Water Assessment Program (SWAP) Report For Royalston Elementary School



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 22, 2002

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	ROYALSTON ELEMENTARY SCHOOL
<i>PWS Address</i>	94 WINCHINDON RD.
<i>City/Town</i>	ROYALSTON
<i>PWS ID Number</i>	2255004
<i>Local Contact</i>	PAUL VARNEY SR.
<i>Phone Number</i>	(978) 249-2900

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	2255004-01G	200	507	Moderate

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

## Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for the facility is a 6 inch diameter bedrock well drilled to a depth of 180 feet. The well site is within the wetland buffer zone. The well has a Zone I of 200 feet, and an Interim Wellhead Protection Area (IWPA) of 507 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers such as clay that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Inappropriate activities in Zone I;**
2. **Underground Storage Tank; and**
3. **Local road.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one high threat land use or activity in the IWPA.

1. **Zone I-** Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains an athletic field. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### **Recommendations:**

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ If the school intends to continue utilizing the athletic field in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

2. **Underground Storage Tank** – A UST with heating oil is within the IWPA. The tank was installed in 1995, and is equipped with a leak detector and alarm. If not properly monitored UST can leak and its contents can potentially contaminate groundwater.

#### **Recommendations:**

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks (refer to attachments).
- ✓ During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the UST is being filled.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Fuel Storage Below Ground	No	Yes	High	Heating oil tank, tank is up to date with leak detection and alarm
	Stormwater drain	No	Yes	Low	Drains away from well and outside of IWPA
	Local road	No	Yes	Moderate	Rural road- encourage limited use of road salt

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

3. **Local road** – A local road is located within the IWPA. Roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact local fire department to ensure that the IWPA is included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Royalston Elementary School should review and adopt the following recommendations at the facility:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- ✓ Consider well relocation if Zone I threats cannot be mitigated. Please note that DEP Permit Approvals must be obtained prior to the installation of a new well.

### Training and Education:

- ✓ Train staff on proper hazardous material transport, use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum

### Facilities Management:

Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/brp/dws/dwspubs.html](http://www.state.ma.us/dep/brp/dws/dwspubs.html).

### Planning:

- ✓ Work with local officials in Royalston to include the school's IWPA in **Aquifer Protection District Bylaws** and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

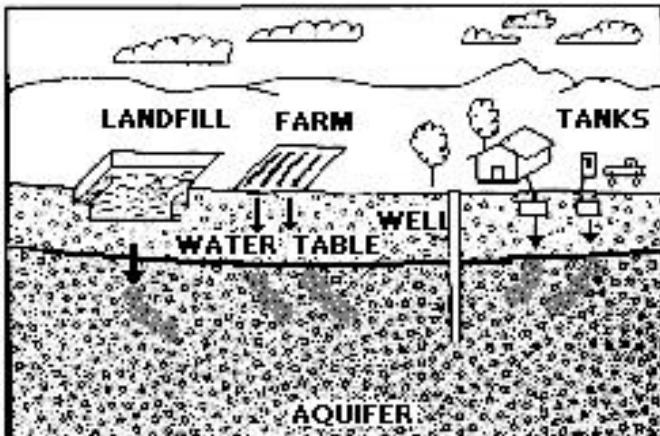


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**For More Information:**

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 792-7650 x 4030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water department and town boards.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix





# Source Water Assessment Program (SWAP) Report For New Boston Nursing Home

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 12, 2001

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	<b>New Boston Nursing Home</b>
<b>PWS Address</b>	<b>P.O. Box 216</b>
<b>City/Town</b>	<b>Sandisfield, Massachusetts</b>
<b>PWS ID Number</b>	<b>1260001</b>
<b>Local Contact</b>	<b>Ellie Bauer, Administrator</b>
<b>Phone Number</b>	<b>413-258-4731</b>

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1260001-01G	218	536	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The New Boston Nursing Home, located in the rural town of Sandisfield, is home to approximately 55 men with about 40 staff. The facility is served by an on-site septic disposal system. Well 01G is reportedly, a 174-foot deep, 6inch diameter gravel developed well, constructed in 1968. However, based on the depth of the well, it is believed that the well actually utilizes the bedrock aquifer. The safe yield was not determined at the time of construction, but the average daily water consumption at the facility is 6,500 gallons per day. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 218 feet and 536 feet, respectively. The Zone I is the protected area

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. These protective radii have been calculated based on the available metered data; however, the actual recharge area to the well may be significantly larger or smaller than the IWPA.

The well is located just north of the confluence of two rivers in an area mapped as a shallow, unconfined sand and gravel deposit that parallels both the Clam River and the west branch of the Farmington River. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has chlorine (sodium hypochlorite) added as a disinfectant. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Nonconforming activities in the Zone I;**
2. **Septic System;**
3. **Low-density Housing;**
4. **Transportation Corridors; and**
5. **Improper storage of hazardous household materials.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lots, and Transportation Corridors	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	Yes	Yes	Moderate	See septic systems brochure attached
Low density Housing	Yes	Yes	Moderate	Supply residents with BMP guidance; refer to septic system brochure
Floor Drain in boiler room	Yes	Yes	Moderate	Bring floor drains into compliance with Department regulations. Consult UIC coordinator.
Storage of household hazardous materials	Yes	Yes	Moderate	Provide secondary containment
Electrical Transformers	Yes	Yes	Moderate	Request information regarding PCB in MODF from your electric company
Nursing Home	Yes	Yes	Low	Nonconforming Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

The overall ranking of susceptibility to contamination for the well is moderate based on the presence of moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming Zone I** – Currently, the water supplier does not own or control the entire Zone I area. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I area includes the New Boston Nursing Home, septic system leach field, a private residence, State Route 57, and parking lots for the nursing home and New Boston Inn. It was noted during the site visit that the wellhead is below grade and the cap was not a sanitary well cap.

**Recommendations:**

- ✓ Control access to the wellhead area and make every effort to acquire Zone I control or ownership.
- ✓ Replace split well cap with a watertight, sanitary seal cap and raise wellhead above grade.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Septic System** -The Zone I contains components of the nursing home's septic system. The IWPA contains the septic system leach field for the entire nursing home, residences and other small businesses. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

**Recommendations:**

- ✓ Provide staff and area residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Upgrade and maintain the facility's system as required.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**3. Low-density Housing** - The Zone I contains a residence with associated parking and septic tank. Potential threats from residential users are mismanagement of household waste, improper disposal of non-sanitary waste, and lack of septic system maintenance.

**Recommendations:**

- ✓ See septic system recommendations.
- ✓ Monitor roadside for spills and leaks.
- ✓ Supply residents with information about BMPs for household hazardous waste management and lawn care.

**4. Transportation Corridors** - State Routes 57 is located within the Zone I and both Routes 57 and 8 are within the IWPA. Accidental leaks, spills, and road salt are some of the possible threats associated with transportation corridors. At the time of the site visit, New Boston Nursing Home expressed concern about the most recently reported sodium level in the well water.

**Recommendations:**

- ✓ Inspect facility drainage and direct, as is feasible, road runoff away from the wellhead.
- ✓ Raise the wellhead above grade to protect against flooding.
- ✓ Continue monitoring the sodium levels in the water.
- ✓ Contact the Massachusetts Highway Department regarding

**Glossary**

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

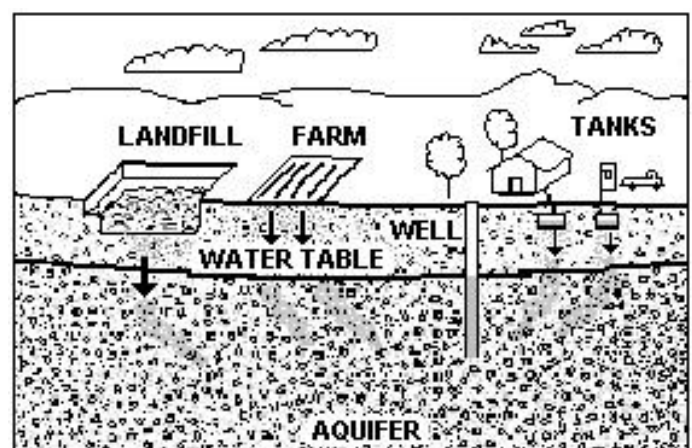


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

your concerns, if the sodium concentrations in the well water increase. Request reduced winter road salting near the Zone I.

- ✓ Do not use salt deicers within the Zone I.

**5. Improper storage of hazardous household materials** – Paints, grout, deicers (calcium chloride), and other hazardous household wastes are stored within the basement of the nursing home.

#### Recommendations:

- ✓ Store in stable, enclosed cabinets with secondary containment. Items no longer used should be properly discarded during the town's hazardous waste day.
- ✓ Provide secondary containment for storage of potentially hazardous items.

Other issues noted during the site visit were the presence of electrical transformers and floor drains in the boiler room. Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some transformers. Contact the local utility to determine if the transformers contain PCBs. If PCBs are present, urge their immediate replacement. Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm.

Floor drains in boiler rooms provide drainage in the event of a plumbing failure. Floor drains in areas that contain hazardous materials must be sealed or discharged to a sanitary sewer or tight tank. The discharge point of the floor drain is unknown but assumed to be the septic system. The floor drain must therefore either be sealed or protected to prevent hazardous materials from discharging through the floor drain. Do not store hazardous materials within the boiler room. The system utilizes propane for fuel. Require your boiler maintenance contractor to protect the floor drain from lubricants and spills especially during maintenance. Boiler blowdown must be disposed of off-site. Please consult the regional UIC coordinator Rick Larson at 413-755-2207. Refer to attached brochures and UIC forms.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the New Boston Nursing Home's well susceptibility to contamination. New Boston Nursing Home is commended for using propane as the fuel source. New Boston Nursing Home should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Raise the wellhead and replace current spilt well cap with a sanitary, watertight well cap.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Remove as is feasible all non-water supply activities within the Zone I, or use BMPS.

#### Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well by locking facilities, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ If the facility and residents intend to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations, such as at the entrance to the facility.
- ✓ Inspect drainage and ensure that stormwater runoff is directed away from the well and treated according to DEP guidance if required.

**Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, maintained on a regular basis and upgraded as required.
- ✓ Wellheads should terminate above grade and have a surface sanitary seal. Concrete or earthen collars should slope away from wellhead.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in Sandisfield to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
SILVER BROOK CAFE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

February 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Silver Brook Café
<i>PWS Address</i>	Route 57
<i>City/Town</i>	Sandisfield, Massachusetts
<i>PWS ID Number</i>	1260003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1260003-01G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

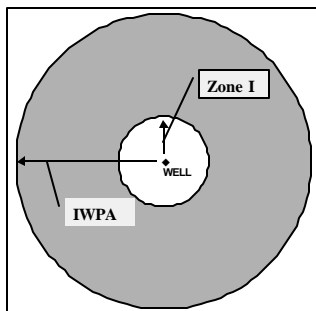
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1260003-01G)**

Zone I = 100 ft.  
IWPA = 422 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The source is considered to be under the influence of surface water and the system is required to address this issue through specific actions as detailed by the Department. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as oil within the IWPA. Other moderate threats include local roads, parking, and storage of road salt within the IWPA.

This source water assessment report is based on information provided by you on your Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Savoy Elementary School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 31, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Savoy Elementary School
<i>PWS Address</i>	26 Chapel Road
<i>City/Town</i>	Savoy, Massachusetts
<i>PWS ID Number</i>	1263003
<i>Local Contact</i>	Mr. William S. Enser, Jr.
<i>Phone Number</i>	(413) 243-1416

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1263003-01G	100	407	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Savoy Elementary School is a small, rural school with a total student and staff population of approximately 75 people per day, located on the corner of Chapel Road and Hawley Road in the town of Savoy, Massachusetts. Savoy is a residential, recreational community situated in the Berkshire Hills in northern Berkshire County. The Town of Savoy does not have municipal water or sewer; therefore, the school operates a single public water supply well and disposes of wastewater through an on-site septic system. The school uses propane as a heating fuel and has a single aboveground

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

storage tank adjacent to the school. The school well is a 6-inch diameter, 80-feet deep bedrock well that is located approximately 75 feet from the closest school building, but within 20 feet of the school parking area and 64 feet from Hawley Road. The well is located within a 3-foot diameter pit that is approximately 3-feet deep with a cement cover.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. An Interim Wellhead Protection Area (IWPA) is a primary recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA. The Zone I and IWPA protective radii for Well #1 are 100 feet and 407 feet, respectively and was originally based on the estimated daily water use from Title 5 flow estimates. Current metered water use data confirms that the average daily water use is approximately 380 gallons per day. The school was recently expanded and replaced the septic system leachfield; the addition and the leachfield are within the IWPA but outside of the Zone I.

Geologic mapping and field observations indicate the school is located in the Berkshire uplands with thin till overburden covering the bedrock. The bedrock is mapped as schist of the Rowe-Hawley Zone. The bedrock is a complex series of folds and faults with bedrock mapped as various metamorphic rock types. There is no evidence of a continuous confining, clay layer or a thick till layer in the immediate vicinity of the well. Wells located in these conditions are considered to be located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from activities on the ground surface. Please refer to the attached map of the Zone I and IWPA.

The water from the well is treated through a limestone contactor to raise the pH for corrosion control prior to distribution. In addition, a review of water quality data shows sodium levels increasing from 22 mg/L in 1995 to 74 mg/L in 2001. There is no drinking water standard for sodium, however, the DEP does have a guideline of 20 mg/l for sodium. The DEP requires public water suppliers to regularly monitor the quality of the water. For current information on monitoring results and treatment, please refer questions to the Public Water System contact person listed above in Table 1 for the most recent information. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the EPA's website for Envirofacts.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Septic system components	Yes	Yes	Moderate	Maintain septic systems.
Transportation corridors and school parking	Yes	Yes	Moderate	Control the use of deicers and coordinate with emergency response personnel. Monitor for leaks and spills near the well.
School	Yes	Yes	Moderate	Use BMPs for school facilities.
Residential	No	Yes	Moderate	Provide information on BMPs.
Horse farm/hay fields	No	Yes	Moderate	Manure management, fertilizers/pesticides, and petroleum products.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

## 2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination. Although most of the agricultural activities are outside of the Zone I and IWPA, because the IWPA is not a scientifically determined recharge area, the DEP often identifies activities that are near the source.

### Key issues include:

1. **Non-conforming Zone I;**
2. **School;**
3. **Residential;**
4. **Transportation corridor/parking; and**
5. **Agricultural activities.**

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use or activity in the protection areas of the well, as seen in Table 2.

**1. Non-conforming Zone I** – Well #1 has a non-conforming Zone I with respect to ownership and activities within the Zone I. There is a play structure within the Zone I of Well #1, however, the DEP may allow some passive recreation and other non-threatening activities within the Zone I. There are also non-conforming activities in the Zone I such as parking. The school is commended for recently installing a berm around the parking area to prevent runoff from the parking area to flow toward the well.

### Recommendations:

- ✓ Continue to work toward prohibiting/limiting activities in close proximity to the well and using BMPs to protect the water supplies.
- ✓ Do not allow any additional non-conforming activities within Zone I. Inspect the well cap and pit regularly to ensure the security of the pit, and that there is no standing water in the pit. Replace the split cap with a sanitary, watertight cap that is secure.
- ✓ Although historically this has not been a problem, if at any time, water is evident in the pit, consider raising up the well casing to above grade with a sanitary seal sloping away from the casing to prevent the potential for water ponding at the well casing.
- ✓ Monitor the runoff from the parking area and roadways to ensure there is no runoff directed toward the well.

**2. School and residential use** – The school facilities and portions of residential properties are within the Zone I and IWPA of the well. Elementary schools generally use only household hazardous materials and the recommendations for small schools are similar to those for residents. In addition, there are state and federal controls on some activities and products used at schools to promote “healthy schools”. All of the school’s facilities are located within the IWPA of the well. Potential exists for contamination of the well by on-site use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. If managed improperly, activities associated with residences and the school can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, petroleum products for home equipment and lawn maintenance equipment and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.

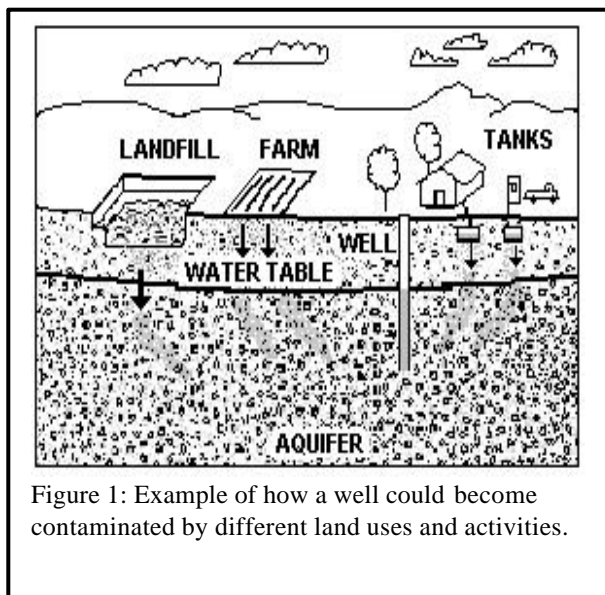


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at the following MADEP website <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### School and Residential Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and online at [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), the MA DEP website which provides BMPs for common residential issues.
- ✓ Continue the use and maintenance of BMPs for activities within close proximity to the well.
- ✓ Continue to prohibit the use pesticides or fertilizers within the Zone I of the well. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers.
- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Association's Healthy Schools website for additional information at: [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html)
- ✓ Prepare a policy and a plan for maintenance operations regarding the boiler. DEP recommends that you require your boiler maintenance contractor use containment and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**6. Transportation corridor and parking** – The parking areas for the school and a portion of Chapel Road and Hawley Road are within the Zone I of the well. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

#### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.
- ✓ Notify the Town Highway Department of your well and inform them of the elevated sodium levels. Review the stormwater management near the well with the Highway Department and work to ensure runoff is directed away from the well.



### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The Savoy Elementary School is commended for utilizing propane as a fuel source, expanding the school away from and outside of the Zone I and for installing a berm around the parking area to prevent runoff from flowing toward the well. The DEP encourages continued diligence in monitoring activities within and near protection areas. The water supplier should review and adopt the key recommendations above. Consider contacting the agricultural property landowner just to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.

Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Call the local office of the NRCS in Pittsfield at 413-443-6867 ext. 3 for assistance and review the fact sheet available online at the following NRCS website: <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. This may be appropriate for the Savoy Highway Department. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources regarding hobby farmers' BMPs.

#### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets





# Source Water Assessment Program (SWAP) Report For Berkshire School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 11, 2002

**Table 1: Public Water System (PWS) Information**

<i><b>PWS NAME</b></i>	<b>Berkshire School</b>
<i><b>PWS Address</b></i>	<b>245 North Undermountain Road</b>
<i><b>City/Town</b></i>	<b>Sheffield, Massachusetts</b>
<i><b>PWS ID Number</b></i>	<b>1267001</b>
<i><b>Local Contact</b></i>	<b>Tim Fulco, Director of Physical Plant</b>
<i><b>Phone Number</b></i>	<b>413-229-1337</b>

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well #2	1267001-02G	352	1464	High
Well #3	1267001-03G	360	1600	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Berkshire School is a private boarding school for grades 9-12, located in the rural community of Sheffield served by on-site water supply and septic disposal. Sources 01G and 01S are physically disconnected from the system, designated as emergency sources and therefore, not addressed in this report. Well 02G is a 255-foot deep, 6-inch diameter well, with 88 feet of casing. The Department approved well 02G in August 1991, allowing for the asphalt tennis court within the Zone I with the stipulation that no activities would be added or expanded within the Zone I. The approved safe yield of this source is 34.5 gallons per minute with a maximum daily withdrawal of 49,700 gallons. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 352 feet and 1464 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The final construction and approval of Well 03G has recently been completed. This 8-inch diameter, 700-foot deep bedrock well was approved by the Department through the New Source Approval Process for a total maximum daily withdrawal rate of 54,000 gallons per day, or 37.5 gallons per minute. This source has a Zone I radius of 360 feet and an IWPA radius of 1600 feet.

USGS maps the bedrock within the area as quartz-mica schist. The overburden is a relatively thin layer of till. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Underground Storage Tanks;**
2. **Above-ground Storage Tanks;**
3. **Floor Drains in Boiler Rooms; and**
4. **Septic System.**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	No	Both wells	Moderate	School facilities with in IWPA
Septic System	No	Both wells	Moderate	See Septic System Brochure
Underground Storage Tanks	No	Both wells	High	Multiple tanks, mostly new with alarm systems; monitor for leaks, overfills
Above-Ground Storage Tanks	No	Both wells	Moderate	Multiple tanks; monitor for leaks, cracks, overfills
Floor Drains in Boiler Rooms	No	Both wells	Moderate	See UIC brochure
Parking lots, Internal Transportation Corridors	No	Both wells	Moderate	Limit road salt usage and provide drainage away from wells
Catch basins	No	Both wells	Low	Non-water supply structures in Zone I
Passive Recreation (Tennis Courts)	Well #2	Both wells	Low	Approved within Zone I at time of well approval; prohibit pesticide/herbicide use

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

The overall ranking of susceptibility to contamination for wells 2 and 3 is high, based on the presence of one or more high ranking land use or activity in the Zone I and IWPA, as seen in Table 2.

**1. Underground Storage Tank (UST)** – There are five USTs located within IWPA, with a capacity of 10,000 gallons of fuel oil each. All tanks except one have been replaced and are now double-walled with alarm monitoring. Well #3 is topographically approximately 800 to 850 feet upgradient from the nearest UST or AST. Well #2 is approximately 450 feet, topographically upgradient of the tanks.

**Recommendation:**

✓ USTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**2. Above-ground Storage Tanks (ASTs)** -- There are nine ASTs containing heating oil and propane located throughout the IWPA of both wells. If managed improperly, ASTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

**Recommendations:**

✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface and contained in an area large enough to hold 110% of the liquid volume, should a spill occur.

✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

**3. Floor Drains in Boiler Rooms** -- A floor drain is located in the boiler room, which discharges into the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be sealed, connected to a tight tank or as a last resort, protected to guarantee that boiler blow down, oil or other prohibited discharges cannot enter the floor drain.

**Recommendations:**

✓ Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached). Contact the UIC program for the Western Region

Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122) for assistance.

✓ Interim Actions: cease using the floor drains.

✓ If you wish to retain the drain, install a tight tank and connect the boiler room floor drains to the tank.

✓ Require a policy and plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**4. Septic System** – The facility is served by a 40, 000-gallon septic tank and a 30,000-gallon septic tank. Although the septic system and leach field for the facility are located outside of the Zone I and are topographically down gradient from the well, they are within the IWPA of the well. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. The school is currently evaluating how laboratory wastes are treated and disposed; a tight tank will be installed if required.

**Glossary**

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

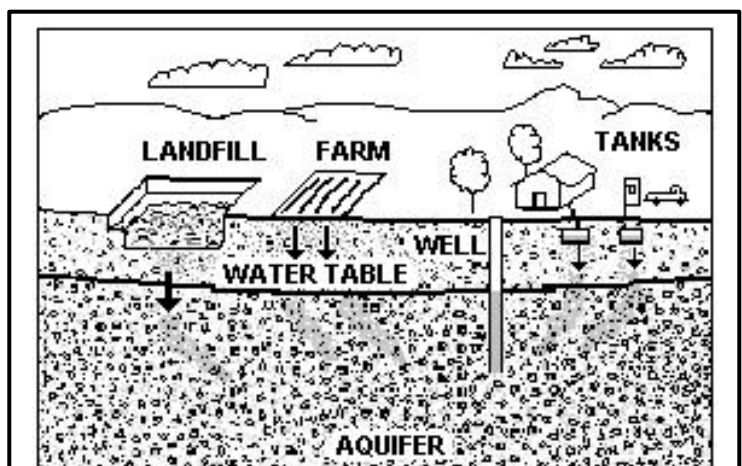


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

### Recommendations:

- ✓ Install a tight tank for science laboratory wastes as soon as possible.
- ✓ Provide staff and area residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Upgrade and maintain the facility's system as required.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Eliminate all non-sanitary waste disposal from the septic system.

Other potential threats to the wells within the IWPA's noted during our visit were parking lots, internal transportation corridors, and catch basins. Vehicles parking within the protective areas pose a risk of release of petroleum products to the aquifer from leaks, accidents or road maintenance. Use minimal road salts and deicers within the protective areas, and monitor the parking lot and roadside for spills and leaks.

Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Direct stormwater drain outflows away from the Zone I and IWPA. Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Berkshire School is commended for replacing underground fuel oil storage tanks and electrical transformers, and for evaluating the need for a tight tank on the chemistry lab drains. Berkshire School should review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Address floor drain issues.
- ✓ Install a sanitary cap on the emergency wellhead.
- ✓ Comply with the wastewater disposal requirements.

### Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating access roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for back-up power sources.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### **Facilities Management:**

- ✓ Berkshire School is a registered Small Quantity Generator of Hazardous Waste. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials such as science labs, discharge drains to a tight tank or sanitary sewer.
- ✓ Bring the floor drain into compliance with DEP Regulations (refer to attachment “Industrial Floor Drain Brochure”).
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

### **Planning:**

- ✓ Work with local officials in Sheffield to include the Berkshire School’s IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department’s Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form





# Source Water Assessment Program (SWAP) Report for Mount Everett School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 18, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Mount Everett School</b>
<i>PWS Address</i>	<b>Berkshire School Road</b>
<i>City/Town</i>	<b>Sheffield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1267003</b>
<i>Local Contact</i>	<b>Mr. Paul Baumann</b>
<i>Phone Number</i>	<b>413-229-7858</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1267003-01G	328	1136	High

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

Mount Everett School has a total staff and student population of approximately 1,085 people and is located in a rural setting surrounded primarily by woodland, wetland, and rural residential land uses. The school is a regional Elementary, Middle and High School and Well #1 is the sole source of water for the school. The well is located within the old, abandoned boiler room. During the reconstruction and expansion of the school in 1991, several attempts were made to drill a new well for the school. Insufficient yield from the wells resulted in utilization of the old well and removal of the boiler and all other peripheral equipment and piping from the room. In addition, the old underground oil storage tanks (UST) were removed and replaced outside of the Zone I protective radius of the well.

The Zone I protective radius for Well #1 is 328 feet and the Interim Wellhead Protection



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are may not be identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Area (IWPA) radius is 1,136 feet. The Zone I and IWPA protective radii are based on an approved pumping rate of 33,120 gallons per day established through a 1991 pumping test and estimated maximum future water demands. Please refer to the attached map that shows the Zone I and IWPA.

Well #1 is a 6-inch diameter well drilled to a depth of 205 feet in the late 1950's. The well has a watertight cap and is finished above grade, in a room with a concrete floor; there is no information regarding a deep sanitary seal around the casing. No drilling records are available for the well other than the steel well casing was driven 35 feet, where bedrock was encountered. There is no description of the overburden material from the driller's log. Borings in the vicinity of the well report the overburden ranges from fine sand and silt to clay with thickness ranging from 17 feet to greater than 35 feet to bedrock. Bedrock mapping of the area and driller's logs from the 1991 drilling efforts indicate the bedrock is a carbonate rock of the Stockbridge Formation consisting primarily of dolomite and marble. Bedrock wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant, continuous hydrologic barrier to contaminant migration.

### Water Quality

At the time this report was prepared, the Mount Everett School well water does not require and does not have treatment. The DEP requires public water suppliers to monitor the quality of the water. For current monitoring results, please refer questions to the local contact identified in Table 1.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

The existing well does not meet DEP's Zone I restrictions, which only allow water supply related activities in Zone Is. There are numerous non-conforming activities within the Zone I and IWPA. The overall susceptibility ranking of the well to contamination is high, based on the proximity of the former oil tank site and the presence of numerous moderate threat land uses or activities in the IWPA. The school's current operator is diligent in monitoring activities that may pose a threat to the school's water supply. Please refer to Table 2 for a list of activities within the protection areas.

### Key issues include:

1. **Activities within Zone I**
2. **Confirmed Release of Hazardous Materials Site**
3. **Septic System Components**

**Table 2: Activities within the Water Supply Protection Areas**

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
Underground Storage Tank (UST)	No	Yes	High	UST is double lined, tank with interstitial monitoring
Confirmed Oil Release Site (UST)	Yes	No	**	RTN # 1-0001015 - Tier 2 – Oil release
School	Yes	Yes	Moderate	All of the school's facilities are within the Zone I or IWPA
Septic System components	Yes	Yes	Moderate	Septic tank in Zone I, Groundwater Discharge (permitted) in IWPA

\* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

\*\* For more information on an individual site in the MCP or an updated status, please contact the WERO BWSC - 413-784-1100.

**Table 2: Activities within the Water Supply Protection Areas (continued)**

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Parking and storm drains	Yes	Yes	Low	Monitor for spills and maintain catchbasins
Passive Recreation	No	Yes	Low	Athletic fields pose minimal threat provided pesticides are not used on fields. Continue policy of no fertilizer or pesticide usage.
Above Ground storage tank (AST)	No	Yes	Low	Propane storage is a minimal threat to groundwater
Utility Transformer	No	Yes	Low	Although PCBs are not likely present, MODF is present in transformers
Low Density Residential Use Septic systems and lawn care	No	Yes	Moderate	See Fact Sheets for septic and lawn care

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**1. Zone I Activities** - The well's Zone I contains school buildings, parking areas, and school playground.

**Recommendation:**

- ✓ Since it is not feasible to remove all non-water supply activities from Zone I to comply with DEP's Zone I requirements, please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system. Monitor all existing activities, use Best Management Practices for maintenance work and prevent any new activities within Zone I.

**2. Confirmed Oil Release Site** - Presence of Oil Contamination Sites within the Zone I - The Zone I for Well #1 contains a DEP Tier II Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 10001015. The release was discovered during the removal of the old oil tank that had been located near the old boiler room. The drinking water

program at the time required additional monitoring of the water quality. For information regarding the location of the site refer to the attached map. Appendix I includes additional information regarding the Massachusetts Contingency Plan (MCP) and where additional information is available.

**Recommendation:**

- ✓ Comply with the requirements of the MCP process and continue monitoring as appropriate.

**3. Septic System Components** - The holding tank is located within the Zone I of the well. However, boring logs indicate clay, in the immediate vicinity of the tank on the order of 20 to 30 feet in thickness, thereby minimizing the potential for contaminant migration to the aquifer in the event of a leak. The wastewater is treated in a small on-site secondary treatment system and discharged to a system permitted through a Groundwater Discharge Permit. Requests for additional information can be made through the WERO DEP Wastewater Program. The school does not have a tight tank to capture science laboratory and art laboratory wastewater. The science laboratory sinks reportedly are equipped with limestone traps to neutralize acids, however, these would not neutralize bases or remove any other constituents that may impact the RBC or groundwater quality. The wastewater Title 5 system has a groundwater discharge permit with water quality limits. The recharge area is on the perimeter of the IWPA, topographically downgradient from the well.

**Recommendations:**

- ✓ Establish a hazardous material handling/hazardous waste disposal procedure and policy for the teachers and include maintenance staff. The arts and science programs must control the disposal of any constituents that may be considered

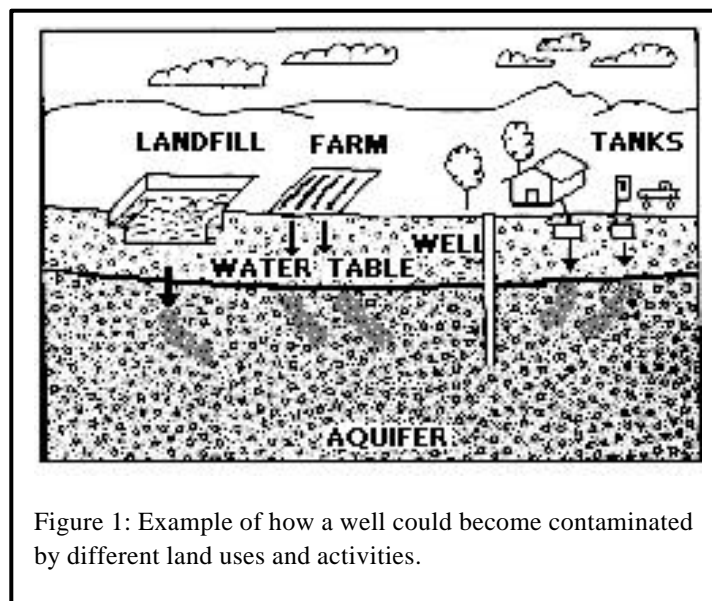


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

hazardous. Title 5 regulations prohibit the disposal of any non-sanitary waste to the sanitary waste disposal system. Title 5 regulations prohibit the disposal of non-sanitary waste to the sanitary waste disposal system; a tight tank or municipal sewers are used for disposal of non-sanitary waste. The school does not have a municipal sewer system near enough to connect to. Contact the Western regional office of DEP to speak with Paul Nietupski of the wastewater management program at 413-755-2118 and your local Board of Health to discuss this option.

- ✓ The school is currently not registered as a generator of hazardous waste. Review the enclosed documents "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" and a fact sheet for Very Small Quantity Generators to determine your status and regulatory requirements. Contact the Massachusetts Office of Technical Assistance at 617-626-1061 regarding proper hazardous material use, storage, disposal, emergency response, and best management practices. Arrange to have potentially hazardous materials disposal available for the school staff, including the custodial staff, either through the Town's hazardous waste collection days or through other means. It is likely that the school will have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training.

Other land uses and activities noted within the protective areas are an underground heating oil storage tank, parking areas, passive recreation and residential homes. The fuel oil tank was installed in compliance with regulations in place in 1991. Paved parking areas with drainage utilizing BMPs and discharging away from the well, pose minimal threat to water quality. Storm drains and catch basins, must however, be maintained to ensure protectiveness.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

The MA DEP encourages limiting the activities near the wells and continued diligence in updating your protection measures. The Mount Everett School and District should review and adopt the following recommendations at the facility:

### Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Erect water supply protection signs along the perimeter of the protection areas
- ✓ Consider once again investigating an alternative water source if existing threats cannot be mitigated.
- ✓ Comply with the MCP regarding the existing release site.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check for leaks and accidental spills, etc.
- ✓ Maintain storm drains that direct road and parking lot drainage away from well, as feasible.
- ✓ Continue the current practice of not using pesticides, fertilizers within the Zone I. Minimize the use of road salt as practical.

### Facilities Management:

- ✓ Establish a written plan for the science and art departments for the management of materials used in class and the proper storage and disposal of potentially harmful materials. These types of materials are primarily used in the senior high school science

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

labs and the arts department. Contact the Massachusetts Office of Technical Assistance at 617-626-1061 regarding proper hazardous material use, storage, disposal, emergency response, and best management practices.

- ✓ Post sinks as appropriate with a reminder to students and staff that only sanitary waste is disposed of in the sinks.
- ✓ Contact the local BOH and the DEP regarding a tight tank to dispose of senior high science and art lab waste.
- ✓ If you do not have a storm water maintenance plan, develop one. Maintenance plans should include an inspection and maintenance schedule. Inlets should be cleaned out a minimum one time per year and inspected quarterly. The outfall should be inspected annually for structural integrity and determine if it needs to be cleaned. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all DEP regulations, policies and guidance.

### **Planning:**

- ✓ Work with local officials in town to include the facility IWPA in the Aquifer Protection District Bylaws.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. ATTACHMENTS**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Very Small Quantity Generator of Hazardous Waste Fact Sheet
- Site/Reportable Release Lookup – Table from DEP BWSC Website - Sheffield

## **5. APPENDICES**

- APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

## **APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas – Bureau of Waste Site Cleanup**

DEP's data layer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)**

<b>RTN</b>	<b>Release Site Address</b>	<b>Classification</b>	<b>Town</b>	<b>Contaminant Type</b>
1-001015	Mount Everett School	Tier II	Sheffield	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
SHEAS PINE TREE INN



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 13, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Sheas Pine Tree Inn
<i>PWS Address</i>	1375 North Main St
<i>City/Town</i>	Sheffield, Massachusetts
<i>PWS ID Number</i>	1267006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1267006-01G	118	429	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

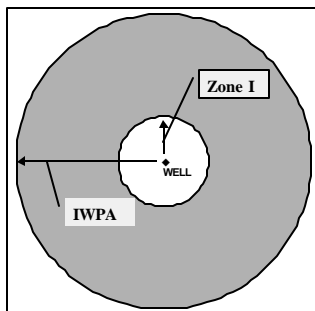
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1267006-01G)**

Zone I = 118 ft.  
IWPA = 429 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and parking areas within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For The Options Institute & Fellowship

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 23, 2004

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	The Options Institute & Fellowship
<i><b>PWS Address</b></i>	2080 South Undermountain Road
<i><b>City/Town</b></i>	Sheffield, Massachusetts
<i><b>PWS ID Number</b></i>	1267008
<i><b>Local Contact</b></i>	Mr. Adam Wadell
<i><b>Phone Number</b></i>	413-229-3788

<i><b>Source Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well #3	1267008-03G	301	889	Moderate
Well #4	1267008-04G	116	428	Moderate
Well #5	1267008-05G	131	436	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Options Institute & Fellowship (Options) is located on South Undermountain Road in the town of Sheffield in southwestern Massachusetts and Salisbury, Connecticut. The facility is located on approximately 95 acres of land. The main Options facility is a treatment and training center founded in 1983 for adults to develop self-direction and

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

empowerment. The facility also includes the Autism Treatment Center of America for autistic children and adults on an adjacent property east of Route 41. Sheffield is a small rural residential community that has a public water system, however the system does not serve the area where Options is located. There is no municipal wastewater treatment facility in Sheffield. Options is therefore served by on-site water supply wells and wastewater is discharged to a common septic system for the main complex and a small septic system at the Son-Rise building.

The facility's population fluctuates but has the capacity for 50 staff and over 55 clients per day. Visitors and volunteer staff may attend the institute for one week to eight weeks. The facilities include the main house, several residential and teaching facilities, a fitness center, a cafeteria and maintenance facilities.

The facility maintains five wells on site. Water is supplied to the various facilities by three sources: Wells #3 (03G), #4 (04G) and #5 (05G). Wells #1 (01G) and #2 (02G) are located in the front yard adjacent to the Main House but those two wells are severed from the system, designated as emergency wells and are currently used only for irrigation. Emergency wells will not be further addressed in this report. Well #3 was approved in 1991 to replace Wells #1 and #2 as part of an expansion of the facility. Well #3 was permitted by the DEP through the New Source Approval Process and was installed and tested in accordance with current regulations. Well #3 is a 435-foot deep bedrock well located approximately 300 feet from the Mountain House cafeteria and two new residential/classroom buildings. Well #3 provides water for the Main House, the Mountain House, the two new mountainside facilities, the Ice House, the Boat House, and the Options House. Well #4 is a 6-inch diameter well drilled into the bedrock aquifer located at the Son-Rise building on the east side of Route 41. The Son-Rise building houses the staff and clients for the Autism Treatment Center for America. The facility has two units for clients and facilities for day staff and clients. There is no information regarding the depth or construction of the well. Well #5 (05G) is a 6-inch diameter well located south of the Connecticut state line that is located immediately adjacent to (within 20 feet of) the Staff House. Well #5 is newly registered as a public water supply well and there is no information regarding the depth or construction of the well. The well serves the administration building (the Lama Barn) and three residential buildings (the Staff House, the Ravine House and the Woodland House). One underground fuel oil storage tank was observed approximately 100 feet from the well at the Staff House and according to Options staff, each of the resident halls served by Well #5 has a UST for fuel oil.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	04G and 05G	-	-	Contact DEP prior to conducting any work within Zone I or expanding facilities.
Transportation corridors/parking	04G and 05G	All	Moderate	Manage stormwater and limit road salt usage.
Underground storage tank (fuel oil)	05G	05G	High	Use BMPs for fuel oil storage and delivery. Upgrade or convert to propane as is feasible.
Aboveground storage tank (fuel oil)	04G	All	Moderate	Use BMPS for fuel oil storage and delivery.
Institutional uses	05G	All	Moderate	Provide BMPs for household hazardous waste management. Use IPM for lawn maintenance.
Septic system components	05G	All	Moderate	The leachfield and some components are within the protection areas.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The Zone I is the area immediately around the wellhead while the Interim Wellhead Protection Area (IWPA) is a larger area that likely contributes water to the well. The Zone I area is the most protected area and DEP regulations allow only water supply related activities or other non-threatening activities within the Zone I. The IWPA is only an interim protection area; the actual area of contribution to the wells may be smaller or much larger than the IWPA. The Zone I and IWPA radii for the facility's wells are as follows: Well #3 – Zone I is 301 feet and IWPA is 889 feet based on an approved withdrawal rate of 22,000 gpd; Well #4 – Zone I is 116 feet and IWPA is 428 feet based on Title 5 flow estimates from the building usage. The Zone I and IWPA for the newly registered Well #5 are 131 and 436 feet based on an estimated Title 5 flow of 1,600 gallons per day from the well. These protection areas may be adjusted to be larger or smaller based on actual metered water use once that information becomes available. Please refer to the attached map that shows the Zone I and IWPA radii.

The complex is located in an area where geologic mapping indicates thin till overburden covering the bedrock. However, the well log for Well #3 indicates 161 feet of casing set 74 feet into bedrock. The driller's log indicates 5 feet of "dirt", 86 feet of "hardpan" (till) and 34 feet of "decayed" rock. The geologic mapping of the area indicates a bedrock contact at the site indicating the bedrock at Well #3's location as quartzose argillite of the Mount Everett Formation with the bedrock at the location of Well #4 and #5 mapped as marble of the Stockbridge Formation. Water from wells #3 and #4 is treated through a softener prior to use and water from Well #3 passes through an ultraviolet lamp prior to distribution because of historical detections of bacteria when the well was first installed. There is no evidence of an extensive protective till or clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

Public water suppliers are required to regularly monitor water quality from all sources at the facility. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. Non-conforming Zone I;
2. Institutional use;
3. Transportation corridors/parking;
4. Underground/Aboveground storage tanks; and
5. Hazardous materials storage and use.

The overall ranking of susceptibility to contamination for the well is high based on the presence of high threat land uses or activities in the Zone I of Well #5 as seen in Table 2. However, the main well for the facility (Well #3) is conforming with respect to DEP regulations and has a moderate threat ranking based on moderate threat land uses within the IWPA of the well. There are several moderate threat land uses and activities in the Zone I and IWPA of Well #4.

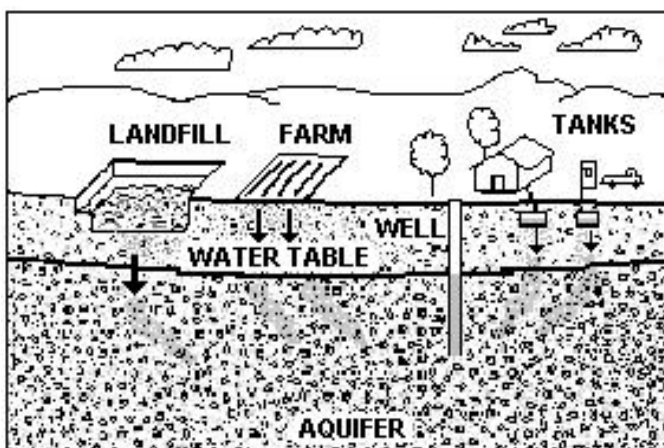


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

**1. Non-conforming Zone I** – The water supplier does not own the entire Zone I area for Well #4 and although it does own the Zone I for Well #5, there are numerous activities within the Zone I that are non-conforming. Facility components include fuel storage, transformers, buildings, sewer lines, and parking are within the Zone I of wells #4 and #5. Systems not meeting DEP Zone I requirements for ownership or control or that have non-conforming activities within Zone I must receive DEP approval and address Zone I issues prior to increasing water use or modifying systems/facilities.

#### Zone I Recommendations:

- ✓ Prohibit any non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides or fertilizers in Zone I.
- ✓ Inspect the wells regularly to ensure the cap is secure, there is no standing water near the wells and that runoff cannot infiltrate around the well casings.
- ✓ Relocate the wells if they cannot be secured or if water quality is impaired by activities near the wells.
- ✓ Monitor all activities associated with petroleum products within the Zone Is and replace USTs as feasible or appropriate.

**2. Institutional use** – The Options Institute consists of land uses that are common to high-density residential uses. The facility utilizes on-site septic disposal systems and some components are within the Zone I and/or IWPA of one or more of the sources. The facility utilizes both propane and fuel oil for heating with both ASTs and USTs used. At least one fuel oil UST is within the Zone I of Well #5. Although the facility is not a registered hazardous waste generator, the maintenance staff utilizes and stores small quantities of household hazardous materials, e.g. stains, paints and cleaning materials. If managed improperly, activities associated with institutional uses can contribute to drinking water contamination. Stormwater drainage, roadway drainage and parking areas all pose a potential threat to the water supplies if accidental release of petroleum products occurs. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated piping can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Institutional Land Use Recommendations:

- ✓ Promote BMPs for stormwater management and pollution controls. Monitor all activities associated with the petroleum products, especially delivery.
- ✓ Have spill containment/absorbent materials available on-site
- ✓ The facility utilizes fuel oil as well as propane for a heating source. Containment of the fuel system to prevent accidental releases to the basements and ground should be reviewed in the buildings. Fuel tanks should be within containment to protect floor drains, cracked floors or walls that could act as conduits if fuel oil leaks or is spilled from the storage tanks. Contact the regional DEP staff from the UIC program (Rick Larson 413-755-2207) for advice regarding protecting any

floor drains or potential conduits to the ground. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require your boiler maintenance contractor use containment, protect any drains and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- V Continue the use of Best Management Practices for all activities at the facility. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- V Investigate Integrated Pest Management and Best Management Practices within the Zone I and IWPA.
- V Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides or fertilizers within Zone I.
- V Review your emergency response plan regarding accidental releases within the protection areas. Ensure that emergency responders in town are aware of the locations of your resource areas.

**3. Transportation corridor/parking** – The facility’s internal corridors and South Undermountain Road are within the protection areas. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

**Recommendations:**

- V Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they area aware of the location of your well and the protection areas.

**4. Underground/Aboveground petroleum storage tanks** – According to Options’ staff, there are at least two underground fuel oil tanks and several aboveground tanks within the protection areas of Wells #4 and #5. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store.

**Recommendation:**

- V Replace older USTs with propane as is feasible or upgrade tanks in accordance with applicable regulations for storage tanks. Any modifications to the tanks must be accomplished in a manner consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs. For those tanks that are located within the State of Connecticut contact officials in Connecticut to determine appropriate regulatory requirements.
- V Monitor all activities associated with the petroleum products, especially delivery.
- V Provide containment for the tanks and sleeve the fuel lines.
- V Have spill containment/absorbent materials available on-site.
- V Seal all cracks in the floor and any floor drains if they cannot be adequately protected to prevent a prohibited discharge.

**5. Hazardous Materials storage and use** – The facility utilizes hazardous materials for maintenance. The floor drains in the maintenance building were sealed at the time of the assessment and there is no water to the building and therefore no wastewater disposal. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through any septic system on the site. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator.

**Hazardous Materials Storage and Use Recommendations:**

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- V Ensure that management plans are up to date and staff review BMPs for the handling of hazardous materials.



Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Review and adopt the key recommendations above and the following:

#### **Zone I:**

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Replace the well cap on Well #5 and prevent runoff from infiltrating around Well #3.
- ✓ Remove or upgrade fuel oil USTs as feasible.

#### **Facilities Management:**

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Educate the staff and control the use of hazardous materials in the Zone I.
- ✓ Continue to minimize the use of fertilizers and pesticides.
- ✓ Monitor fuel oil delivery and use to prevent releases.

#### **Planning:**

- ✓ Work with your community to develop and include your IWPAs in an aquifer protection district along with other public water supplies in town.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Continue long term planning for the system that includes maintenance of the water and wastewater systems.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Source Water Assessment Program (SWAP) Report

## For

### Custom Extrusion, Inc.



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
March 23, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Custom Extrusion, Inc.</b>
<i>PWS Address</i>	<b>34 Home Road</b>
<i>City/Town</i>	<b>Sheffield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1267010</b>
<i>Local Contact</i>	<b>Franklin Kellogg</b>
<i>Phone Number</i>	<b>413-229-3098</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	01G	190	487	High
Well #2	02G	190	487	High

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

#### Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Massachusetts Department of Environmental Protection (MA DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

The Custom Extrusion Inc. (CEI) manufacturing facility, has been in business since 1957, employs approximately 45 people, and produces custom-made rigid thermo-plastic parts and forms. CEI manufactures its own metal dies, can run up to seven extrusion lines and supply specialized product finishing. The facility consists of approximately 50% manufacturing and finishing and 50% storage and warehousing. The two water supply wells, the primary well, Well #1 and the auxiliary well, Well #2, are located approximately 10 feet from the southeast side of the main building and approximately 25 feet from the southwest corner of the main building, respectively. Both wells have a Zone I of 190 feet and an Interim Wellhead Protection Area (IWPA) of 487 feet. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I and IWPA protective radii were calculated utilizing historical metered water use data submitted by CEI.

Both wells have their casing extending above grade and are 6inch diameter bedrock wells drilled into a carbonate formation consisting generally of dolomite and marble. The generalized geologic map of the area indicates fairly complex folding and faulting of the bedrock with several geologic contacts in the immediate vicinity of the site. Well #1 was drilled in 1988 and is reportedly 450 feet deep with an estimated yield of 50 gpm; well #2 was drilled in 1957 and is 165 feet deep and does not have a yield estimate. Bedrock is relatively shallow in the immediate vicinity of the facility and therefore the aquifer has a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from surface spills. Although Well #1 is in close proximity to the parking areas and the process buildings, it is utilized as the primary well because it has fewer potential contamination sources proximal (within the Zone I) to the well and supplies adequate yield for the facility's needs. Well #2 reportedly has limited yield and is immediately adjacent to an abandoned dry well, a 10,000 fuel oil underground storage tank and a sanitary waste (septic) system that is scheduled to be abandoned and replaced outside of the Zone I. Please refer to the attached map of the Zone I and IWPA.

The water currently does not require treatment and is not treated. For current information on monitoring results, please contact Mr. Franklin Kellogg from CEI at the number listed above.

### Current Status

The CEI facility is currently in compliance with and proceeding under a mutually agreed upon Administrative Consent Order to bring all wastewater and other water discharges into compliance with appropriate regulations. CEI has made commendable progress in eliminating uncontrolled discharges of water to the environment through floor drains, dry wells and several septic systems. Sampling of the soil and groundwater at those former water disposal sites show no indication of contamination at the facility.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas for CEI's water supplies that are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is high, based on the

presence of at least one high threat land use or activity in the Zone Is, as seen in Table 2.

### Key issues include:

1. Nonconforming Zone Is;
2. Storage, Use and Generation of Hazardous Materials in the Zone I and IWPA
3. Underground Storage Tank (UST) for Heating Oil
4. Roadways

**1. Zone Is** - Currently, neither Well 1 nor 2 meet DEP's restrictions, that allow only water supply related activities in Zone I. The Zone Is for Wells 1 and 2 contain the process area, office and storage facility, parking areas and roads. The 10,000 gal. UST is also located within the Zone I of Well #2. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or

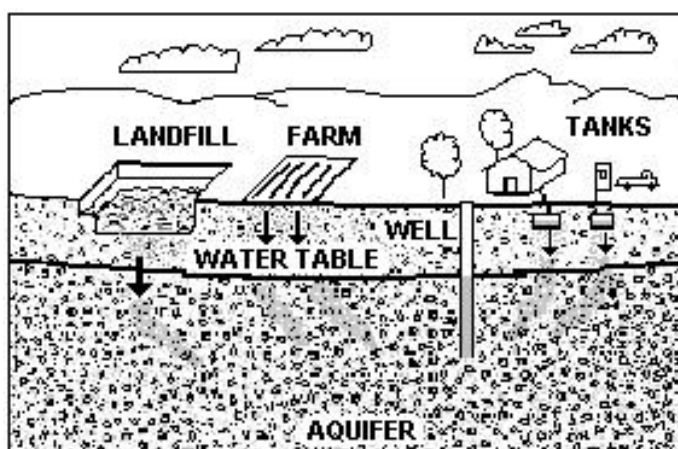


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**Table 2: Table of Activities within the Water Supply Protection Areas for Wells #1 and #2**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Plastic Extrusion/Manufacture	Fuel Storage Below Ground (UST)	Well #2	Well #1	High	10,000 gallon fiberglass No 2 fuel oil tank
	Hazardous Materials Storage	Both wells	No	Moderate	Storage and use of oils and solvents with containment
	Parking lot & driveways	Both wells	Both wells	Moderate	Limit salt usage and provide drainage away from wells
	Septic System	No	Both wells	Moderate	See septic systems brochure in the appendix
	Very Small Quantity Hazardous Waste Generator (VSQG)	Both wells	Both wells	Low	Generation of waste oils and solvents
Residential Homes	Septic Systems/lawn care	No	Both wells	Moderate	See septic systems brochure in the appendix
	Local roads	Both wells	Both wells	Moderate	Notify local maintenance/emergency response personnel that you are a PWS
Agriculture	Pasture	No	Well #2	Low	Only haying at present. No significant agricultural threat at this time

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

modifying systems.

### Recommendations:

- Keep all new non-water supply activities out of the Zone I.
- Educate all staff regarding the importance of proper disposal practices and use of Best Management Practices.

**2. Hazardous Materials** - CEI is a registered very small quantity hazardous waste generator. The facility stores raw product and waste materials in the loading dock area and contracts with a hazardous waste disposal firm. Floor drains throughout the facility have been appropriately closed and all non-sanitary discharges to the sanitary waste system have been eliminated. The existing sanitary waste water system has been upgraded.

### Recommendation:

- Use Best Management Practices and comply with regulations regarding the handling, storage, and shipping of the hazardous materials and wastes.

**3. Underground Storage Tank** – A heating oil UST is within the IWPA of Well 1 and the Zone I of Well 2.

### Recommendation:

- All tanks in close proximity to water supply wells should be upgraded to meet current construction standards and closely monitored for integrity. Any

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**4. Roadways** – Local roads run through the Zone Is and IWPAs of both Wells 1 and 2. Accidents can release spills of petroleum products, primarily oils and gasoline and potentially transported chemicals.

Other land uses within the protection areas include residential homes, a registered injection well and agricultural activities. At least two residential homes are located within the IWPA of Wells #1 and #2. The potential threats from residential homes include septic systems, pesticide use, inappropriate management of petroleum and other household hazardous materials. CEI operates a registered injection well that receives non-contact cooling water, the injection well is located within the IWPAs of both drinking water wells. Minor agricultural activities are conducted on the fringes of IWPAs on land owned by CEI. Previously usage was growing corn; the current lease agreement is for growing sod. Agricultural practices, if improperly managed may pose a potential threat to water quality. Be sure that your tenant/contractor is aware that the PWS is in the vicinity and that they contact the Department of Food and Agriculture regarding use of pesticides within and proximal to an IWPA. DFA is also available to provide technical assistance as required. Contact Brad Mitchell of the pesticide bureau at 617-626-1771 or [Brad.Mitchell@state.ma.us](mailto:Brad.Mitchell@state.ma.us).

MA DFA's website is <http://www.massdfa.org/pesticide.htm>

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. PROTECTION RECOMMENDATIONS

Custom Extrusion, Inc. should review and consider adopting the following recommendations at the facility:

### Priority Recommendation:

- 3 Continue controlling water usage to minimize the area of contribution and use diligence in storing and handling hazardous materials on site.

### Zone I:

- Keep all new non-water supply activities out of the Zone I. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, conducting activities within the Zone I or modifying their system.
- Continue monitoring water usage. Keep your total water consumption below the monthly average daily use of 3,894 gpd to maintain compliance with the calculated Zone I and IWPA protective radii.
- Consider well relocation if Zone I threats cannot be managed.
- Closely monitor your UST for indications of leakage. Upgrade as necessary.
- Prohibit public access to the wellhead using locking facilities and posting signs.
- Limit parking near well #1.
- Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism.
- Monitor road and parking lot drainage to ensure it flows away from well. Work with your community to ensure that stormwater runoff in the Zone I and IWPA is directed away from the well and is treated according to DEP guidance.
- Use Best Management Practices and comply with regulations regarding the handling, storage, and shipping of the hazardous materials and wastes.

### **Training and Education:**

- Train all staff on proper labeling, hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- Maintain drinking water protection signs in key visibility locations.

### **Facilities Management:**

- Implement standard operating procedures regarding proper storage, labeling, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/brp/dws/dwspubs.html](http://www.state.ma.us/dep/brp/dws/dwspubs.html).
- Upgrade all oil/hazardous material storage areas to incorporate proper containment, labeling and safety practices.
- Septic system components should be inspected and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- Concrete protective surface pads or collars around wells should slope away from wellhead.
- Pole mounted utility transformers may contain PCBs. Contact the utility to determine if the PCB containing oil has been replaced. If PCBs are present, urge the immediate removal.

### **Planning:**

- Work with local officials in Sheffield to include CEIs IWPA in their Aquifer Protection District Bylaws and to assist you in improving protection.
- Prepare a Wellhead Protection Plan and Emergency Response Plan to address short-term water shortages, and long-term water demands and protection. Keep the phone number of a bottled water company readily available.
- Work with the Sheffield Board of Health to encourage education of residents regarding proper maintenance of septic systems, chemical management and lawn care. See attachments.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- Encourage farms in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) or DFA in addressing management issues as necessary. Be sure that your tenant/contractor is aware that the PWS is in the vicinity and that they contact the Department of Food and Agriculture regarding use of pesticides within an IWPA. DFA is also available to provide technical assistance as required. Contact Brad Mitchell of the pesticide bureau at 617-626-1771 or [Brad.Mitchell@state.ma.us](mailto:Brad.Mitchell@state.ma.us). MA DFA's website is <http://www.massdfa.org/pesticide.htm>

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussions to assist the water supplier in his efforts to protect his water and further review overall local drinking water protection measures.

### **Attachments**

- ◆ Map of the Public Water Supply (PWS) Protection Area.
- ◆ Recommended Source Protection Measures Fact sheet
- ◆ Wellhead Protection Tips for Small Public Water Systems
- ◆ Your Septic System Brochure
- ◆ Developing a Wellhead Protection Plan





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Shelburne Falls Fire District**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Shelburne Falls Fire District
<i><b>PWS Address</b></i>	9 Williams Street
<i><b>City/Town</b></i>	Shelburne
<i><b>PWS ID Number</b></i>	1268000
<i><b>Local Contact</b></i>	Mr. Harold Wheeler
<i><b>Phone Number</b></i>	413-625-6392

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

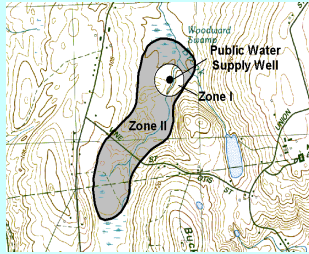
### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

### System Susceptibility

**High**

**Zone II #: 232**

**Susceptibility: High**

Well Names	Source IDs
New Well #1	1268000-03G
Well #2	1268000-02G

The town of Shelburne is a small community in the Berkshire foothills of northwestern Massachusetts. Shelburne, settled in the early-1700's as part of Deerfield, was established as a town in the mid-1700's, and initially developed as a farming and later, an industrial community along the Deerfield River. The developed section of town is located within the Shelburne Falls section of town on the western border delineated by the Deerfield River. The community is currently primarily a residential agricultural community with an emphasis on artisans, and natural and cultural attractions. The Shelburne Falls Fire District provides water for the Shelburne Falls area of town. The District maintains two groundwater supplies, New Well #1 (03G) and Well #2 (02G); 03G was developed as a replacement well to the original Well #1 that was abandoned as a source of water. The District also maintains the Fox Brook Reservoir as an emergency water source. The emergency and abandoned water sources will not be discussed further in this report.

New Well #1 and Well #2 are located approximately 220 feet apart, within the same, relatively narrow, unconfined, sand and gravel aquifer that lies within the North River valley in Colrain, the Town north of Shelburne. New Well #1 is located approximately 130 feet from the river and Well #2 is located downgradient of Well #1 and approximately 120 feet from the river. The wells are both used as primary wells and function alternately. Both wells are 18 x 24-inch diameter, gravel packed wells, have 10 foot long, 200 slot screens; New Well #1 is 55 feet deep while Well #2 is 45 feet deep. New Well #1 and Well #2 are located within the same hydrogeologic regime, and share the same Zone II contribution area.

The aquifer is a glacially deepened, bedrock valley that was filled in with sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 years ago. Streams and rivers have reworked and eroded the glacial deposits and recent streams have deposited additional alluvial material. Boring logs and maps in the North River valley indicate medium to coarse sand and gravel deposits up to approximately 82 feet in depth. There is no evidence of a confining, protective clay layer in the North River aquifer in the vicinity of New Well #1 and Well #2. Due to the proximity of wells to the river, under pumping conditions, the wells withdraw water from the aquifer west of the river and water is likely induced to flow from the river into the aquifer.

The bedrock in the area is a complex series of folded metamorphic rocks with igneous intrusions. The bedrock in the Zone II area is associated with the lower Conway formation and the equivalent of Goshen Schist. The bedrock is mapped as a quartz mica schist and marble, equivalent to the Goshen Schist, and a quartzite conspicuous amphibolite.

Each well has a Zone I protective radius of 400 feet immediately around the wellhead. The Zone II was delineated by consultants for the Water Department utilizing geologic mapping, and analytical and numerical modeling. Data for the analysis was gathered from extended duration pumping tests and boring logs. The North River aquifer is considered to be highly vulnerable to contamination due to the absence of a hydrogeologic barrier (i.e. clay) that can prevent contaminant migration from activities on the land surface. Please refer to the attached map to view the boundaries of the Zone II and consult the Consumer Confidence report for current water quality data.

Sodium hydroxide is added to the water from the wells to raise the pH for corrosion control and a chlorinator is available and used as is necessary. For current information on water quality monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The land uses within the Zone II for the Shelburne Falls Fire District wells are a mixture of forest, cropland, residential, industrial and commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Hazardous materials storage and use
4. Confirmed hazardous waste release sites
5. Wastewater treatment plant
6. Transportation corridors and Utility right-of-way
7. Agricultural activities
8. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

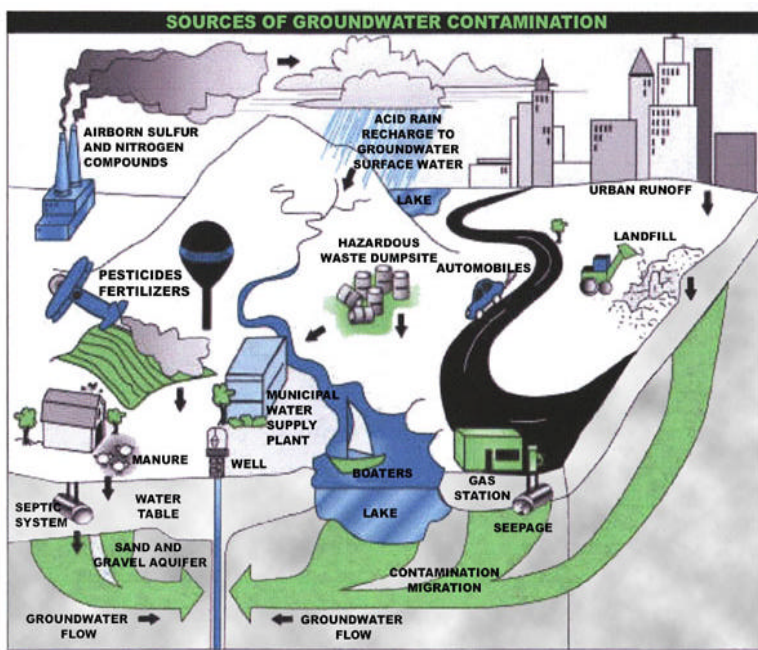
**1. Non-conforming Zone Is** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Currently, the Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction, Memorandum of Understanding or other legal mechanism as approved by the DEP. The public water supplier does not own or control the entire Zone I for either of

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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the wells. Only activities directly related to the water supply, or other non-threatening activities, as determined by the DEP, are allowed within the Zone I. However, numerous water sources were developed prior to the 400-foot Zone I requirement and are therefore grandfathered. The Department encourages grandfathered systems to acquire ownership or some alternate method of control of the Zone I land use activities. The Shelburne Falls Fire District has actively pursued methods of protecting and/or acquiring the Zone I land and the Department has approved the Zone I for Well #3 with the farm field west of the North River.

#### Zone I Recommendations:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Continue your current efforts to purchase land and/or negotiate a conservation restriction for land within the Zone I. Continue monitoring activities conducted in Zone I
- ✓ Agreement Options - For any potential future water supply development or additional land acquisition in the Zone I or Zone II, consider a Memorandum of Understanding and Right of First Refusal.

A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of fields within the Zone I would not have manure, fertilizers or pesticides spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.

The Department commends the District for its proactive efforts to acquire control of the Zone I property and recommends continued efforts in establishing a program for planning to acquire ownership or control of property within the areas critical to protecting water quality. This recommendation is not only for the existing sources but also should be considered for future development of sources if they are needed. Although a land taking by eminent domain is not appropriate for the current situation, it may be considered for future well development as necessary.

**2. Residential Land Uses** – Approximately 20% of the Zone II land area consists of residential areas. Some areas of the Zone II are connected to municipal sewer, other portions utilize on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of

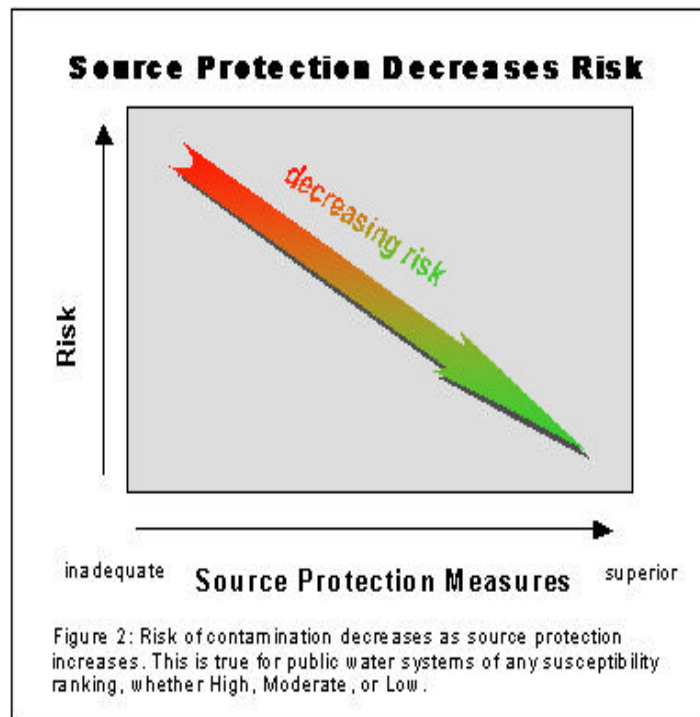
#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agriculture</b>			
Fertilizer/Pesticide Storage or use - Crops	5	M	Fertilizers, pesticides, manure and land application of sludge: leaks, spills, improper handling, or over-application. Farms also often utilize petroleum products and hazardous materials and waste.
Non-commercial livestock (manure spreading)	2	M	Manure (microbial contaminants): improper handling. Petroleum products for equipment used on site.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides and fertilizers: over-application or improper storage and disposal
Septic Systems / Cesspools (Some areas are on sewer)	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aboveground Storage Tanks	1	M	Materials stored in tanks: spills, leaks, or improper handling
Stormwater Drains/ Retention Basins	1	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Utility Rights-of-Way	3	M	Corridor maintenance pesticides: over-application or improper handling; construction
NPDES Discharges	2	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Underground Storage tanks	2	H	Materials stored in tanks: spills, leaks, or improper handling
Auto Repair Shop	1	H	Automotive fluids, vehicle paints and solvents: spills, leaks, or improper handling
Cemeteries	1	L	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids



Activities	Quantity	Threat*	Potential Source of Contamination
<b>Miscellaneous</b>			
Transportation Corridors	Several	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Gas Stations/ Service Stations	1	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Transformers	Several	L	MODF and possibly PCBs: spills, leaks, or improper handling. Contact the electric company to ensure no PCBs are within the transformers.
Industrial Lagoons and Pits	1	M	Remediation is currently on-going
RCRA TSDF Facilities	1	H	Hazardous wastes: spills, leaks, or improper handling or storage
Industry/Industrial Facilities	3	H	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Hazardous Materials Storage	3	M/H	Hazardous materials: spills, leaks, or improper handling or storage
Wastewater Treatment Plant	1	L/M	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management
Wood products manufacture (roof trusses)	1	L	Potential petroleum, products from vehicles and equipment

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the protection areas may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can



be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with Colrain planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Hazardous Materials Storage and Use** – Six percent of the land area within the Zone II is commercial, industrial or waste disposal land use. An industrial complex is located at the former AF&F facility, the Wastewater Treatment Plant is located on the west side of the North River and a roof truss manufacturer is located at the northern (upgradient end) of the Zone II. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. As you are keenly aware, hazardous materials that are improperly stored, used, or disposed, become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain or allowed to spill directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Continue current efforts to educate and work with local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to ensure that the District is included in their emergency response plans for notification of any release that may impact the groundwater or surface water of the North River. This should include any releases that may result in a pass-through of the wastewater treatment plant or a direct spill to the river. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate and assist the community on promulgation of a hazardous materials handling and floordrain regulation and inspection program. Refer to the brochures regarding “Industrial Floor Drains” and Hazardous Waste Handling for more information.

**4. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0011974 and 1-0013555. Refer to the attached map and Appendix B for more information.

#### **Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Continue to participate in the monitoring of progress of the ongoing

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - Increased groundwater monitoring and treatment
  - Water supply clean up and remediation
  - Replacing a water supply
  - Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

remedial action conducted at the confirmed release sites.

**5. Transportation Corridors and Utility Right-of-Way** - State highways and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing material, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins. The stormwater drainage along Rt. 112 within the Zone II discharges to the North River.

There are numerous unpaved ways as well as legal (authorized) and illegal (unauthorized) trails throughout the Zone II watersheds. Unmanaged access may result in vandalism and illegal dumping.

Power transmissions lines run through the Zone II. Vegetation control measures have the potential to introduce contaminants into resource protection areas. Pesticides or petroleum products used for mechanical methods of vegetation control may pose a threat to water supplies.

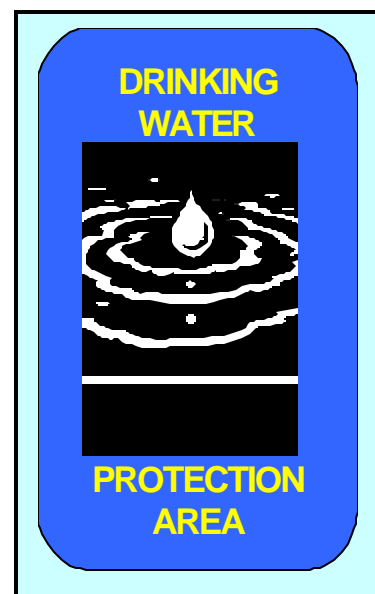
#### **Transportation Corridor and Utility Rights-of-Way Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Contact the Town and State to ensure catch basins are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Continue working with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ Work with local officials during their review of the utility right-of-way Yearly Operating Plans to ensure that water supplies are protected during vegetation control. Ensure that the utility is utilizing accurate maps for their YOP.
- ✓ If your on-going work identifies specific trails, roads or ways as venues of trespassing, continue to evaluate all options for access management.

**6. Wastewater Treatment Plant** - The Zone II contains the Colrain Wastewater Treatment Plant that discharges upgradient of the wells into the North River. The former AF&F facility also has industrial lagoons that are in the process of being closed and remediated. Activities associated with wastewater treatment involve storage and use of hazardous materials such as chlorine and fuel oil. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Industrial wastewater contains a variety of chemicals that are specific to the type of operations conducted at the facility. The discharges from the wastewater treatment plant are regulated by the EPA and include specific limits on the amounts of specific contaminants they are allowed to discharge. Accidental pass-through, spills, leaks or mismanagement of wastewater, hazardous materials and storm water at the plant are potential sources of contamination.

#### **Wastewater Treatment Plant Recommendations:**

- ✓ Communicate with the wastewater treatment facility to be sure it is operated and maintained according to Department requirements.
- ✓ Communicate with the wastewater treatment facility to request stormwater drains and the drainage system around the wastewater treatment plant are mapped in the event of a spill or a release.
- ✓ Communicate with the wastewater treatment facility to be sure that best management practices are used for proper handling of materials and in



- ✓ containing spills and leaks.
- ✓ Communicate with the wastewater treatment facility to be sure emergency planning includes notification of Shelburne Falls Water District in the event a release to the river occurs.
- ✓ Communicate with the wastewater treatment facility to ensure that the plant's underground and/or aboveground storage tanks have secondary containment and are maintained properly.

**6. Agricultural Activities** – There are several agricultural activities within the Zone II area including non-commercial, cropland and hayfields. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water supplies. In addition, farms and large commercial facilities often conduct their own maintenance on their equipment and have storage of hazardous materials and hazardous waste.

**Agricultural Activities Recommendation:**

- ✓ If appropriate, work with the Department to negotiate additional Conservation Restrictions regarding the type of activities conducted in land areas determined to be most critical to source protection.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online and call the local office of the NRCS in Hadley at 413-585-1000 for assistance or online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers and property managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning. Continue efforts to assist Colrain in promulgation of Hazardous Materials Handling Regulations through the Board of Health.
- ✓ Continue your current work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**7. Protection Planning** – The Shelburne Falls Fire District wells and Zone II are located within Colrain. Currently, Colrain does not have water supply protection controls that meet the minimum requirements of the Department's Wellhead Protection regulation 310 CMR 22.21(2). Shelburne Falls Fire District was awarded wellhead protection grants to prepare a wellhead protection plan that included forming a committee with members from Colrain and Shelburne and implementation of the plan. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

It should be noted that activities within the Zone III may pose a potential threat to the water supply. Specifically, under conditions when the river contributes water to the aquifer an accidental release to the river may pose a significant threat to water quality in the wells. This report does not include facilities located within the Zone III either along the river or just outside the Zone II such as USTs/ASTs or other activities that may pose a threat to the sources.

**Protection Planning Recommendations:**

- ✓ Consider inventorying activities in the Zone III, just outside of the Zone II that may pose a potential threat and include them into an Emergency Response Action Plan, this may include USTs or farms that may store or use hazardous materials.
- ✓ Update the Wellhead Protection Plan as appropriate. Continue meeting with the protection committee and

- ✓ coordinating with Colrain to promulgate protection regulations/bylaws in Colrain.
- ✓ Continue to coordinate with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2) to adopt controls that meet requirements of that regulation. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Local controls in Colrain do not regulate floor drains; continue efforts through the Aquifer Protection Committee and the Colrain Board of Health to promulgate floor drain controls, hazardous materials handling regulations and an inspection program.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Proactively pursuing land acquisition options in the Zone I.
- Preparing and implementing a Wellhead Protection Plan and Emergency Response Plan.
- Efforts to include and work with the community of Colrain to promote source protection.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue working with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents. Ensure that industries and the treatment plant include the District in their emergency response plan list of agencies to notify in the event of a release of hazardous materials.
- ✓ Consider inventorying USTs within the Zone II and Zone III.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies including IPM.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. If funds are available, each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource

Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection area. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Areas
- C. Confirmed hazardous material release sites
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

<b>Protection Measures</b>	<b>Status</b>	<b>Recommendations</b>
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO (However, DEP has approved 03G)</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction, MOU and other forms of protection.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue to keep other land uses out of the Zone Is. Continue working with land owners to negotiate a Conservation Restriction and other forms of protection.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>N/A</b>	
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	The wells and Zone II for Shelburne Falls Fire District are completely within the Town of Colrain. Under stressed conditions, the river contributes water to the aquifer, therefore activities within the Zone III should also be monitored and Emergency Response Plans should include upstream (Zone III) land uses that may pose a significant threat.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	When updating plans, include an update on implementation and review the effectiveness of the plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment the plan by reviewing and encouraging a joint emergency response plan with fire department, Board of Health, DPW, industries, wastewater treatment plant, and local and state emergency officials.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> Continue to work with neighboring communities to adopt floor drain regulations and work with industries to protect water supplies.
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II and as appropriate Zone III.





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Anchorage Nursing Home

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Anchorage Nursing Home
<i>PWS Address</i>	Shelburne
<i>City/Town</i>	Shelburne, Massachusetts
<i>PWS ID Number</i>	1268001
<i>Local Contact</i>	Mr. William Barton
<i>Phone Number</i>	800-340-6041

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #3	1268001-03G	253	633	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Shelburne is a small community in northwestern Massachusetts. The Anchorage Nursing Home is located on Route 2 (Mohawk Trail) and serves a population of approximately 33 residents plus staff. Although Shelburne Falls has a municipal water system the service does not extend to this part of town. Therefore, the nursing home utilizes on site water supply and septic system for wastewater disposal. The system operates a single 6-inch diameter, 380-foot deep, flowing artesian bedrock well. Based on the results of a 48-hour extended duration pumping test conducted in 1993 and Zone I restrictions, the well was approved for a daily maximum withdrawal of approximately 10.5 gallons per minute.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The nursing home also maintains two emergency supply wells (01G and 02G). Those wells have been severed from the potable water supply system but maintained in the event of an emergency. Emergency sources will not be addressed further in this report.

The Zone I is the protection area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the approved pumped volume from Well #3, are 253 feet and 633 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Well #3 withdraws water from the bedrock aquifer. The complex is located on an upland area underlain by till and shallow bedrock. The driller's log indicates till over schist and geologic mapping of the area indicates the Conway Formation of metamorphic quartz-mica schist with marble interbeds. Although the well is a flowing artesian well, there is no evidence of a continuous confining unit in the immediate area and there is some bedrock exposure in the vicinity. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The Zone I for Well #3 is in compliance with the DEP Zone I requirements that restrict activities to only those associated with water supply or passive, non-threatening activities. The IWPA encompasses the entire complex including the residential area, the fuel oil storage area (inside the building), parking, maintenance facilities and all of the septic system components. All of these facilities are located topographically downhill from Well #3. The remainder of the IWPA, topographically uphill of Well #3, is woodland.

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Internal transportation/parking	No	Yes	Moderate	Limit road deicing materials usage and monitor parking areas.
Nursing Home	No	Yes	Moderate	Supply BMPs to staff regarding waste disposal
Fuel storage	No	Yes	Moderate	Continue to use best management practices and monitor use and delivery of petroleum products.
Septic system components	No	Yes	Moderate	Continue to maintain septic system and protect it from improper disposal

\* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

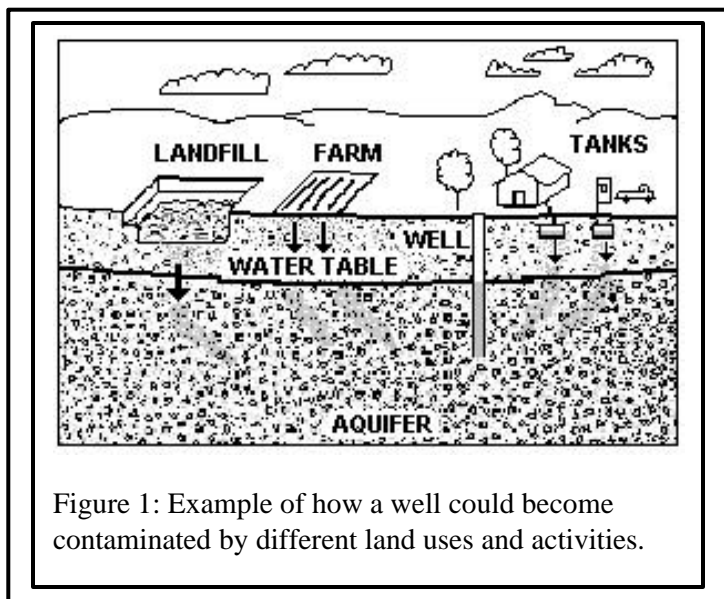


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

### Key issues include:

1. **Transportation/parking**
2. **Nursing Home**
3. **Fuel storage (ASTs)**

The overall ranking of susceptibility to contamination for the Anchorage Nursing Home supply well (03G) is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

The nursing home is commended for installing a more protective well that is conforming with Zone I requirements. Continued monitoring and site management is recommended to prevent accidents and minimize threats within the IWPA protection area of the well.

**1. Transportation/parking** – The facility parking area and maintenance areas are located within the IWPA. These facilities are located topographically downgradient from the well and stormwater runoff is directed away from the well.

#### Transportation corridor Recommendations:

- ✓ Monitor all fuel storage and maintenance equipment.
- ✓ Prepare an Emergency Response Plan that includes coordination among the DEP, the Town, and the State Police in the event of an accident near the wellhead.

**2. Nursing Home/Residential Land Use** – The nursing home facility is located within the IWPA. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include cleaning materials, medications, automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used generally in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### **For More Information:**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

#### **Residential Land Use Recommendations:**

- V Educate staff, particularly maintenance staff on best management practices (BMPs) for protecting water supplies. Focus efforts on management and disposal of cleaning materials and potentially hazardous materials.

## **4. Protection Recommendations**

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Please review and adopt the key recommendations above and as follows as is feasible:

#### **Priority Recommendations:**

- V Continue efforts to control activities in the IWPA area and monitor use of hazardous materials.

#### **Zone I:**

- V Prohibit non-water supply activities from Zone I.
- V Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.

#### **Training and Education:**

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- V Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- V Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

#### **Planning:**

- V Have a plan to address short-term water shortages and long-term water demands.
- V Keep the phone number of a bottled water company readily available in the event of an emergency.
- V Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

#### **Funding Sources:**

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas.
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Clark's Corvair

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Clark's Corvair</b>
<i>PWS Address</i>	<b>Mohawk Trail</b>
<i>City/Town</i>	<b>Shelburne, Massachusetts</b>
<i>PWS ID Number</i>	<b>1268003</b>
<i>Local Contact</i>	<b>Mr. William Barton</b>
<i>Phone Number</i>	<b>800-340-6041</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1268003-01G	100	412	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Clark's Corvair Parts, Inc. is located in Shelburne, a small, rural community in northwestern, Massachusetts. The facility purchases, sells, refurbishes and fabricates parts and manuals for Corvair automobiles. The total staff is approximately 40 people per day and is served by a single potable supply well (01G) located at the facility. Although the center of Shelburne does have public water and municipal wastewater sewers available, this area of town is served by an on-site water supply and septic disposal.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protected area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 100 feet and 412 feet, respectively, based on estimated water use of less than 1,000 gallons per day.

The overburden in the area is mapped as a thin covering of glacial till over bedrock. There is no evidence of a protective barrier of either thick till or of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #1 includes the entire facility, Route 2 as well as a residence and abutting business.

### Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential/commercial land uses with on-site septic disposal**
3. **Transportation corridors, and**
4. **Hazardous materials storage and use.**

Clark's Corvair is commended for their diligent management of hazardous materials on-site. The overall ranking of susceptibility to contamination for Clark's Corvair water system is high, based on the presence of several moderate and one high threat ranked land use or activity in the Zone I and IWPA. Please refer to Table 2 for more details.

1. **Non-conforming activities within Zone I** – Currently, the water supplier does own the entire Zone I area however, the activities conducted within the Zone I are non-

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	--	--	--	Non-conforming uses in Zone I
Hazardous materials storage and use	Yes	Yes	High	Continue the use of BMPs and coordinate with emergency responders.
VSQG	Yes	Yes	Moderate	Hazardous materials/VSQG
Septic system	No	Yes	Moderate	Microbial threat and potential improper disposal of hazardous materials

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor and parking	No	Yes	Moderate	Limit road deicing materials and monitor drainage upgradient of the well
Transformer (ground mounted)	Yes	Yes	Low	Although most transformers today do not contain PCBs, the oils may pose a threat due to the proximity to the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

conforming and pose a threat to the water supply. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I activities prior to increasing water use or modifying systems. The well is located between two of the facility's Quonset huts. Clark's is a registered Very Small Quantity Hazardous Waste Generator and heats with fuel oil utilizing two aboveground storage tanks (ASTs) that are located within buildings. The Quonset huts have cement floors with berms except at the entrance; there are no functional floor drains on site. In addition there are some parking spaces in Zone I. The parking area is paved and drainage flows away from the well.

#### Recommendations:

- ✓ Consider relocation of the well if potential threats cannot be mitigated and water quality is impacted by activities.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- ✓ Where it is feasible, remove all hazardous materials from the Zone I. Continue current good housekeeping practices and the use of BMPs for the storage, use, and disposal of hazardous materials.
- ✓ Carefully monitor the delivery, handling and storage of chemicals and products.
- ✓ Inspect the well casing and cap regularly to ensure it is sanitary and watertight.

**2. Residential Land Uses** – The Zone I and IWPA for Well #3 has high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in

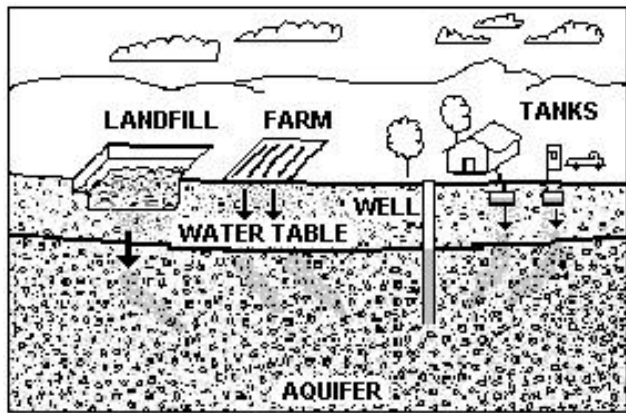


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Appendix A and online at the MA DEP website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor** – Route 2 is located within the IWPA and the access and parking areas for the facility are within Zone I as well. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. Route 2 is topographically downgradient of the well, however the bedrock recharge area has not been determined for this well.

#### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.

**4. Hazardous Materials Storage and Use** – Clark's Corvair utilizes hazardous materials and generates hazardous waste. There were no floor drains observed during the assessment and the hazardous materials appeared to be handled appropriately. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

#### Hazardous Materials Storage and Use Recommendations:

- ✓ Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Consider relocation of the well if potential threats cannot be mitigated.
- ✓ Inventory activities in the IWPA and catalog any new potential threats identified.

#### Zone I:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Redirect road drainage in the Zone I away from well area.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

### Planning:

- ✓ Work with local officials in Shelburne to review Aquifer Protection District Bylaws for compliance with 310 CMR 22.000 and to include Clark's IWPA in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets

W:... \Shelburne 1268003 SWAP 2003-10-16-02





# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
VIPASSANA MEDITATION CENTER



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 5, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Vipassana Meditation Center
<i>PWS Address</i>	386 Colrain-Shelburne Rd.
<i>City/Town</i>	Shelburne, Massachusetts
<i>PWS ID Number</i>	1268010

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1268010-01G	162	458	High	High
Well # 2	1268010-02G	214	528	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

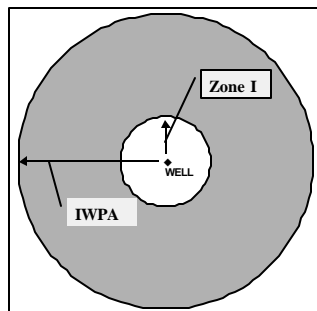
Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1268010-01G)**

Zone I = 162 ft.  
IWPA = 458 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic leach fields within the Zone I / IWPA. The **high** susceptibility to potential non-microbial threats for Well #1 is based on the oil tanks within the Zone I and the IWPA. The **moderate** susceptibility to potential non-microbial threats for Well #1 is based on the local roads and facilities within the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Dragon Hill Condominium

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
February 11, 2002

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	<b>Dragon Hill Condominium</b>
<i>PWS Address</i>	<b>State Route 2</b>
<i>City/Town</i>	<b>Shelburne, Massachusetts</b>
<i>PWS ID Number</i>	<b>1268011</b>
<i>Local Contact</i>	<b>Mr. Elliot Levin</b>
<i>Phone Number</i>	<b>413-772-0076</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1268011-01G	273	720	Moderate
Well #2	1268011-02G	273	720	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Dragon Hill Condominium complex is located south of Route 2 and consists of nine buildings with a total of 18 units. All units have individual, 275-gallon oil tanks located in basements, fueling the forced hot water heating systems. Footing drains and individual unit basement floor drains discharge to the ground surface at different locations throughout the complex. The facilities include internal transportation, parking, lawn and wooded areas. There is no municipal wastewater disposal available and therefore the homes are served by onsite septic disposal. The leachfields are partially within the IWPA but topographically downgradient from the wells.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The complex is served by two active wells, Wells #1 (01G) and #2 (02G) that pump in a lead/lag sequence (well #1 being the lead well) to the storage tank, located in a secure vault. There is an unapproved well #3 (03G) kept as an emergency source. Although this report does not address that well specifically, well #3 is located adjacent to the active wells. The system maintains a propane back-up generator.

The Zone I and Interim Wellhead Protection Area radii for Wells #1 and #2 are 273 feet and 720 feet, respectively. The protective radii were based on an approved pumping rate of 14,400 gallons per day (gpd) determined through a pumping test required by the DEP New Source Approval Process (NSA). Please refer to the attached map that shows the Zone I and IWPA radii. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller. There are two units partially located within the Zone I of well #1.

Wells #1 and #2 are 750-feet deep, 6-inch diameter bedrock wells; both wells are completed approximately 2 feet above grade. The complex is located on an upland area underlain by till and shallow bedrock. The driller's log indicates till over schist. The bedrock is mapped as metamorphic quartz-mica schist with marble interbeds of the Conway Formation. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Dragon Hill Condominium well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. Therefore, the overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of moderate threat land use or activity in the Zone I and IWPA, as seen in Table 2. The Association is commended for current efforts to protect the water supply.

**Table 2: Table of Activities Common to the Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Internal transportation corridors	No	Both Wells	Moderate	Limit road salt usage. Monitor for spills
Ground mounted transformers	No	Both Wells	Moderate	Potential release of MODF
Septic system components	No	Both Wells	Moderate	All components in IWPA
Residential development	Well #1	Both Wells	Moderate	Household hazardous materials and pesticides
Floor drains/Fuel oil storage	Yes	Yes	Moderate	Seal the drains. Contact UIC Coordinator.
Storm drains	No	Both Wells	Low	Road salt, spills and runoff

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

**Key land use issues include:**

1. **Non-conforming activities in the Zone I (Well #1);**
2. **Residential development;**
3. **Septic system; and**
4. **Floor drains.**

**1. Non-conforming activities in the Zone Is** – The Zone I for Well #1 is non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone I for Well #1 contains a portion of two units along with the parking and other activities associated with a residential unit. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I. The Zone I for Well #2 is in compliance with the Zone I restrictions.

**Recommendations:**

- ✓ Do not conduct any additional activities within the Zone

I. Contact MA DEP prior to conducting any activities within Zone I.

- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Encourage residents to utilize Shelburne's household hazardous waste collection days.
- ✓ Monitor parking lots for spills and leaks.
- ✓ Record water meter data regularly to monitor water use and help assess system for potential leaks.

**2. Residential development**– Residential development includes the condominium complex. Normal residential activities pose minimal threat to the water quality of the public water supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and improper disposal through septic systems and they utilize best management practices. In addition, each unit has a floor drain in the basement.

**Recommendations:**

- ✓ Provide residents with information about protecting the facilities resources. Include information on Best Management Practices (BMPs) for the use of pesticides, household hazardous waste and septic system maintenance and disposal practices.
- ✓ Encourage residents to utilize the Franklin County Solid Waste Management facilities for household hazardous waste and paint exchange.

**3. Septic systems** - Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

**Recommendations:**

- ✓ Refer to recommendations under item 2.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**4. Floor drains** - Floor drains are often installed where boilers are present to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials such as oil to flow accidentally into the floor drain, however, preventive measures must be taken. Hazardous materials may not be stored without containment in areas where spills could flow into the floor drains. Floor drains in an area with hazardous materials or petroleum products that do not have secondary containment must discharge to a sewer or a tight tank or be sealed.

**Recommendations:**

Consider the three following options:

- ◆ Seal off the floor drains. Without a trap, floor drains may act as conduits for natural radon gas or for stormwater to backup into the basements. Unless the drains are necessary, seal the drains. Please see the attached UIC forms and contact **Rick Larson of the MA DEP Springfield Office at 413-755-2207 for the proper procedures**. If a sump is required in the basement to relieve hydrostatic pressure beneath the floor, it must be entirely set below grade and sealed (e.g. sealed with a watertight cover) to prevent any accidental spills from entering the sump. Water from the sump cannot discharge to the septic system.

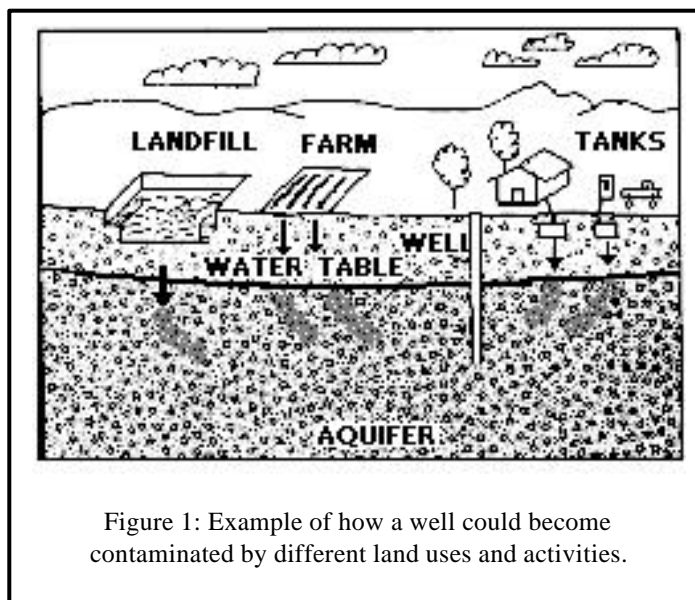


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

- ◆ Protect the floor drains from contaminants. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak in the event of a leak. Install a small berm around the boiler and a larger containment structure around the ASTs to contain 110% of the tank.
- ◆ If the drain is not sealed and protection measures are not taken, install a tight tank and connect the floor drain to the tank. Contact Rick Larson for guidance.

Other uses and activities identified in the protection areas are stormwater discharges located within the IWPA of the wells and electrical transformers. The condominium should consider BMPs and include periodic cleaning of catch basins and street sweeping. Street sweepings and catch basin cleanings are considered solid waste and should be handled as described in the DEP's policy. All electrical transformers contain oil and if the transformers were to rupture, oil would be released to the soils and could potentially impact water quality. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Work with the DEP and local officials regarding protecting the water supplies through emergency response coordination.

## 3. Protection Recommendations

To reduce the system's susceptibility to contamination, the Dragon Hills Condominium should review and adopt the following recommendations:

### Zone I and IWPA:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Prohibit public access to the wells by locking facilities and posting signs at the facility entrance. Check the integrity of the well caps regularly and replace as necessary.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any aboveground tanks for leaks, etc.
- ✓ Work with the local fire department, DEP, State highway, and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents. Ask that your facility be included in Town wide water supply protection efforts.

### Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, certified operator, and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any hazardous materials at the facility. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Continue utilizing Best Management Practices (BMPs) for the use of fertilizers pesticides on facility property.
- ✓ Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in town to include the facility IWPA in an Aquifer Protection District and to assist you in improving protection.



Copies of this assessment have been provided to the public water supplier and town boards.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.

**4. Attachments**

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet
- Franklin County Solid Waste Management District Fact Sheet



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
DEM C. A. HOLMES RECREATION AREA



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	DEM C. A. Holmes Recreation Area
<b>PWS Address</b>	94 Lake View Drive
<b>City/Town</b>	Shutesbury, Massachusetts
<b>PWS ID Number</b>	1272001

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1272001-02G	232	568	Moderate	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

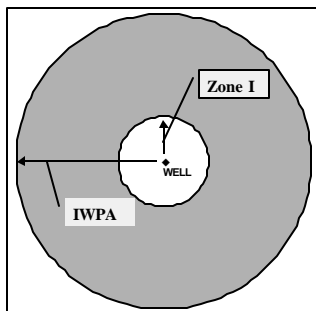
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1272001-02G)**

Zone I = 232 ft.  
IWPA = 568 ft.



## How was my Well's Susceptibility Determined?

Your well's **moderate** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, Sanitary Survey, New Source Approval Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Shutesbury Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

January 14, 2002

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Shutesbury Elementary School
<i>PWS Address</i>	West Pelham Road
<i>City/Town</i>	Shutesbury, Massachusetts
<i>PWS ID Number</i>	1272002
<i>Local Contact</i>	Mr. Walter Turati
<i>Phone Number</i>	413-259-1212

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1272002-02G	270	702	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Shutesbury Elementary School (the school) is a rural, elementary school located on the west side of West Pelham Road in Shutesbury. The school student and staff population is approximately 275 people per day and is served by a single potable supply well (Well #2) located southwest of the school. The school is served by on-site septic disposal; all sewer components are located outside of the Zone I.

The well was approved through the Department's New Source Approval Process prior to renovation and expansion of the school in 1994 and has a Zone I protective radius of 270 feet and an Interim Wellhead Protection Area (IWPA) radius of 702 feet. Please

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller. Well #1 (01G) is an emergency water supply that is physically disconnected from the potable water system and used as an irrigation well. That source is not addressed in this report.

The 200 foot deep, 6-inch diameter is located southwest of the school. Geological mapping in the area identifies the bedrock as the Dry Hill Gneiss, consisting of gneiss and quartzite. Based on topography and site observations, the overburden is assumed to be till; there is no evidence of a confining unit such as clay in the area. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information. Please note that the land use descriptions are limited and the school area is described as Urban Open space for lack of a better descriptor.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, very few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Key issues include:**

1. **Fuel oil storage;**
2. **Floor drains in boiler rooms;**
3. **School facilities and athletic fields; and**
4. **Residential housing.**

The Shutesbury Elementary School well is fairly well protected. There were no activities within the Zone I that pose a significant threat to the water supply. Although there are a few activities of concern within the IWPA, based on the topography, it

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Underground Fuel Oil Storage	No	Yes	High	New tank w/containment
Floor Drains in Boiler Rooms	No	Yes	Moderate	Leachfield outside Zone I; consult with UIC program regarding compliance
Athletic fields	Yes	Yes	Moderate	Do not use pesticide/fertilizers on fields
School facilities and parking	No	Yes	Moderate	Limit road salt usage use BMPs for household hazardous materials. Monitor parking areas
Medium density residential housing	No	Yes	Moderate	Septic systems and household hazardous materials

**-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

appears those activities are primarily downgradient of the well. The overall ranking of susceptibility to contamination for the well is moderate. Please refer to Table 2.

**1. Underground fuel oil storage tank (UST)** – A double-walled steel, fuel oil UST is located within the IWPA of the water supply. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

### Recommendation:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**2. Floor Drains in Boiler Room** – There is a day tank with adequate secondary containment in the boiler room. However, there are floor drains in the boiler room, that discharge to an unknown location. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be sealed, connected to a tight tank or sewer or protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. In the event of a failure of the float in the daytank or a leak in the oil feed lines, oil may enter the floor drains or the crack in the floor next to the small pressure tank for the "irrigation well".

### Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached) or sealed.
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson) at 413-755-2207.
- ✓ Install secondary containment for storage tank. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. We recommend that you establish a policy and plan for conducting maintenance operations on the boiler, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

**3. School facilities and athletic fields** - Elementary schools generally use only household type hazardous materials for cleaning, pest control and lawn care. Part of the recreation field is within the IWPA of the well. Potential exists for contamination of the well by fertilizers, herbicides, and pesticides, all of which can be of concern.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices for field maintenance within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or road salt within Zone I.

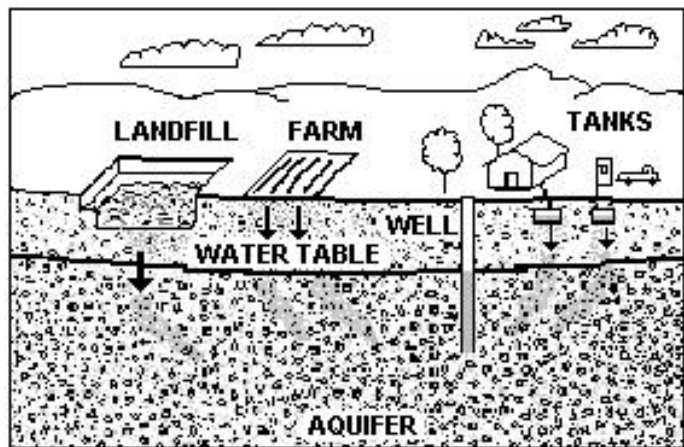


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Monitor roadside for spills and leaks.

**4. Residential housing** – Residential development in general, poses minimal threat to public and private water supplies provided there is proper management of household hazardous materials and maintenance of septic systems. Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

#### Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include all teaching staff, custodial staff, groundskeepers, kitchen staff and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems and supply this information to the Town to distribute to residents.
- ✓ Work with the town to promote household hazardous waste collection days.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. Shutesbury Elementary School and the Town of Shutesbury are commended for the effort shown in siting the well and current protection efforts.

Please review and adopt the key recommendations listed above and as follows:

#### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking area.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

#### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.

#### Facilities Management:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a

Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.

#### Planning:

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.



- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Developing a Wellhead Protection Plan
- Recommended Source Protection Measures Fact Sheet
- Schools Fact Sheet
- Grant Program Fact Sheet
- UIC/Industrial Floor Drain
- Source Protection Sign
- Very Small Quantity Generator (VSQG) information

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For SIRIUS COMMUNITY CENTER



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Sirius Community Center
<i>PWS Address</i>	72 Baker Rd
<i>City/Town</i>	Shutesbury, Massachusetts
<i>PWS ID Number</i>	1272004

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1272004-01G	103	423	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

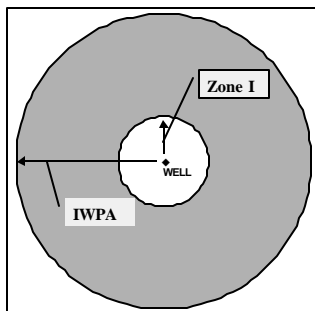
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1272004-01G)**

Zone I = 103 ft.  
IWPA = 423 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the parking, local roads and facilities within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, site visit, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**South Hadley Fire District No. 2**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	South Hadley Fire District No. 2
<i>PWS Address</i>	20 Woodbridge Street
<i>City/Town</i>	South Hadley
<i>PWS ID Number</i>	1275001
<i>Local Contact</i>	William Selkirk
<i>Phone Number</i>	(413) 532-9210

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

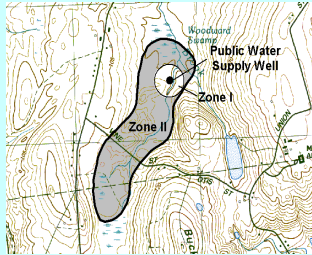
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

## Section 1: Description of the Water System

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



**Zone II #: 615**

**Susceptibility:** High

Well Names	Source IDs
Dry Brook Well	1275001-04G

South Hadley is a medium sized community in western Massachusetts located on the east bank of the Connecticut River. The Town was settled in the late 1600s and incorporated in the late 1700s. South Hadley developed as an agrarian community and later as an industrial community with the influx of the paper industry. Today South Hadley is predominantly a residential community with a prominent college. South Hadley has municipal water and wastewater disposal. However, some areas of town are not served by the municipal sewer system and therefore discharge wastewater through on-site septic systems. Water is supplied by two separate water systems; although the systems are connected and could supply water to the other system in the event of an emergency. South Hadley Fire District No. 1 serves the southern section of town and receives its water from the Massachusetts Water Resources Authority (MWRA), the source being Quabbin Reservoir. South Hadley Fire District No. 2 serves the northern section of Town and receives its water from one groundwater source, Dry Brook Well. Dry Brook Well is located along the Connecticut River near the Hadley town line. The District is proposing to install a well within 50 feet of the existing well as a mechanical backup to Well #1.

The well is an artesian, gravel packed well that is approximately 112 feet deep. The well utilizes water from a confined to semi-confined, sand and gravel aquifer located within a buried, bedrock valley. The bedrock valley, is comprised primarily of sedimentary (sandstone) and volcanic (basalt) rocks of the Hartford Basin, that was somewhat deepened by advancing glaciers and were later filled in with sand and gravel from the receding glaciers and overlain by silt and clay from glacial Lake Hitchcock some 18,000 years before present. Recent alluvial deposits cover the entire valley area. The glacial feature located immediately south of the Dry Brook Well is a delta (sand and gravel) formed when stalled ice melted and discharged meltwater and sediment into Lake Hitchcock. The confining clay layer is primarily contiguous in the immediate vicinity of the well but is known to pinch out south of the well and to the west.

The Zone I is the area immediately surrounding the wellhead, while the Zone II is the land area that contributes water to the pumped well. The Dry Brook Well has a Zone I radius of 400 feet. The Zone II contribution area was delineated by the USGS as part of the SWAP program. The delineation included an analysis of empirical data from an extended duration pumping test and use of the numerical model MODFLOW. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) throughout the Zone II that can prevent contaminant migration. A hydrogeologic barrier does exist in the immediate vicinity of the well and in portions of the Zone II. The hydrogeologic barrier that does exist provides some protection relative to impeding the downward migration of contaminants from areas overlying the barrier. Please refer to the attached map to view the boundaries of the Zone II.

Currently the well water does not receive treatment. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.



## Section 2: Land Uses in the Protection Areas

The land uses for the Zone II for South Hadley Fire District No. 2 are predominantly pasture, cropland, mining, and residential. Land uses and activities that are potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Sand and Gravel Mining
3. Residential land uses
4. Underground Storage Tanks
5. Manure Spreading
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

**1. Non-conforming Zone I** – The Zone I for Dry Brook Well is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non- water supply activities occur within the Zone I:

**Zone I Activities:** Although South Hadley Fire District No. 2 owns the entire Zone I area, a dock and storage shed originally belonging to an abutting property owner still exists and is in use within the Zone I.

### Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.

**2. Sand and gravel mining** – A sand and gravel mining operation is located within the Zone II. Sand and gravel mining is a potential source of contamination due to the possibility of spills or leaks from heavy equipment, fuel storage, and clandestine dumping.

### Recommendations:

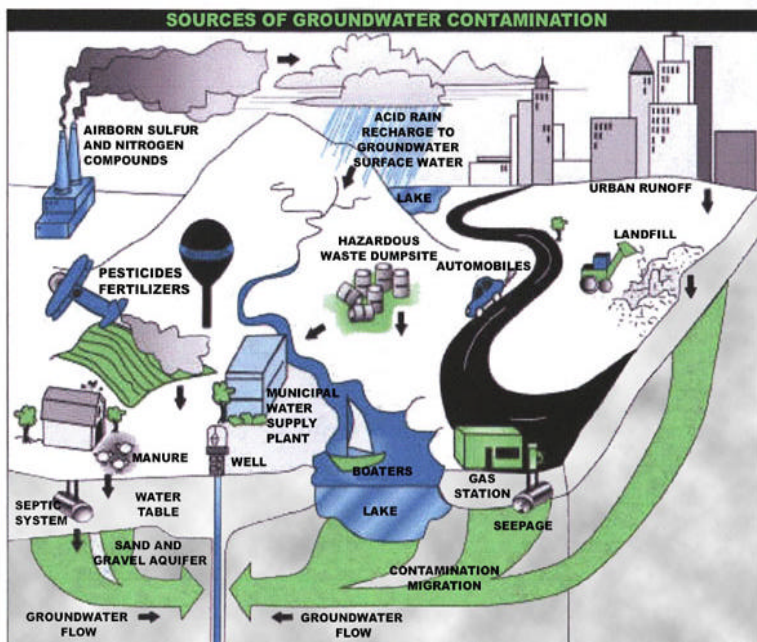
- ✓ Work with the owner to install or allow for the installation of monitoring wells on the northwest side of the mining operations. Annual monitoring for extractable petroleum hydrocarbons (EPH) would potentially allow for the early detection of releases of diesel fuel or gasoline that could impact the well.
- ✓ Encourage Best Management Practices for storage, use, and disposal of oil,

## Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- fuel, and hazardous materials.
- ✓ Inspect the Zone II for signs of clandestine dumping on a regular basis.

**3. Residential Land Uses** – The residential areas within the Zone II do not have public sewers and, therefore, use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) and the associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**4. Underground Storage Tanks** – At least one UST is located within the Zone II area based upon a UST survey conducted by the water supplier. If managed improperly, underground storage tanks and the associated fuel lines can be potential sources of contamination due to leaks or spills of the chemicals they store.

**Recommendation:**

- ✓ Encourage the UST owner to replace the UST with an above ground tank (AST) located on an impervious surface with proper spill containment. Grant money may be available for the UST removal through Massachusetts Department of Revenue. See the conclusions in Section 3 below for more information regarding grant/loan programs.

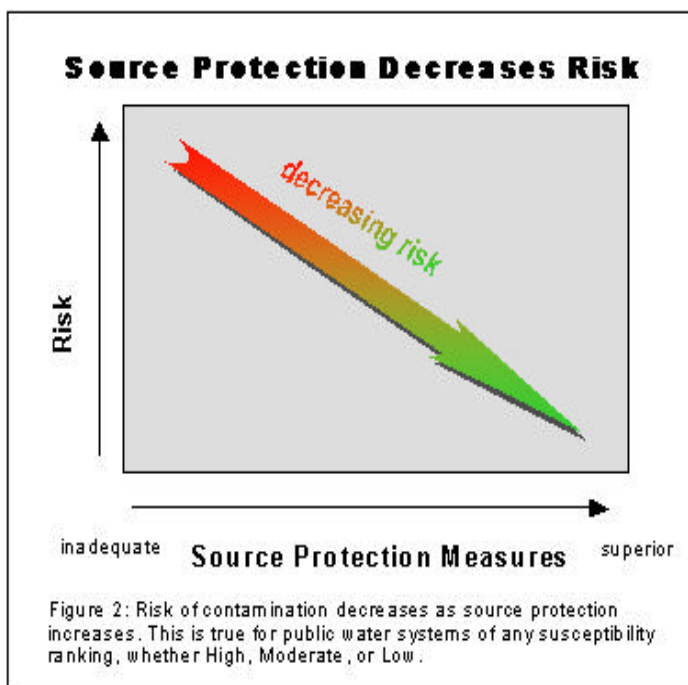
**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**For More Information**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Livestock Operations	1	Moderate	Manure (microbial contaminants): improper handling
Manure Spreading	some	High	Manure (microbial contaminants): improper handling
<b>Residential</b>			
Fuel Oil Storage (at residences)	numerous	Moderate	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Fishing/Boating	-	Low	Fuel and other chemical spills, microbial contaminants
Transportation Corridor	1	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	1	High	Stored materials: spills, leaks, or improper handling

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

**5. Manure Spreading** – Manure spreading on crop land occurs within the Zone II. Given the semi-confined nature of the Dry Brook aquifer, microbial contamination is probably not a significant concern. However, nitrate and nitrite contamination from manure spreading applications could potentially impact the water quality at the well.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department Agricultural Resources' Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

**6. Protection Planning** – Currently, the Town of South Hadley has water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). However, the Town's Water Supply Protection District bylaws should clearly define the boundaries of the district as corresponding to the Primary and Secondary Recharge Areas for Existing and Potential Public Water Supply Wells and Watershed Area for Public Water Supply Reservoir as shown on the map titled "South Hadley Water Protection Area". Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. South Hadley currently has a Wellhead Protection Plan.

**Protection Planning Recommendations:**

- ✓ Verify that the newly approved Zone II is covered by the existing Water Supply Protection District.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

**Current Land Uses and Source Protection:**

As with many water supply protection areas, Dry Brook Well's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Having a Wellhead Protection Plan;
- Having a formal Emergency Response Plan;
- Having a wellhead protection committee;

#### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

- Providing wellhead protection education to schools and colleges; and,
- In general being proactive relative to wellhead protection issues.

#### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue working with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any remedial action conducted for oil or hazardous waste contamination sites that may be identified in the Zone II in the future.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection.

Additional source protection recommendations are listed in Table 3 and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. Grants are also available from the Massachusetts Department of Revenue's (DOR's) Underground Storage Tank (UST) Program for the removal of

underground storage tanks. For more information regarding the DOR UST, program visit their website at: [http://www.dor.state.ma.us/ust/ust\\_home.htm](http://www.dor.state.ma.us/ust/ust_home.htm).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Table 3: Current Protection and Recommendations**

<b>Protection Measures</b>	<b>Status</b>	<b>Recommendations</b>
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue routine inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue relationship with the owner of the dock and shed to not store chemicals, pesticides, petroleum products or other hazardous materials within the Zone I.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	<b>YES</b>	Verify that the recently approved Zone II falls within the existing Water Supply Protection District. Request a modification of the District boundaries as appropriate.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>YES</b>	Update the plan as appropriate to include any new information from the Zone II delineation.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Continue current efforts in the joint emergency response plan with fire department, Board of Health, DPW, and state emergency response officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>YES</b>	
Does the PWS provide wellhead protection education?	<b>YES</b>	



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Southampton Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Southampton Water Department
<i><b>PWS Address</b></i>	17 Gilbert Road
<i><b>City/Town</b></i>	Southampton
<i><b>PWS ID Number</b></i>	1276000
<i><b>Local Contact</b></i>	Mr. Joseph Slattery
<i><b>Phone Number</b></i>	413-527-3664

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

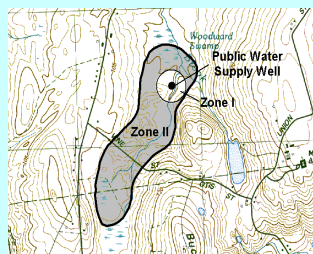
#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

### Zone II # 201

*Susceptibility: High*

Source Name:	Source ID
College Highway	1276000-01G

Southampton is a small, agricultural/residential town in the Connecticut River Valley of western Massachusetts. The Southampton Water Department maintains and operates a single groundwater source and supplements the system by drawing raw surface water from the City of Holyoke's 42-inch transmission main (by legislated right), served by the Tighe-Carmody Reservoir. For information regarding that source, please refer to the Source Water Assessment and Protection Report for the City of Holyoke. Southampton is in the process of developing a replacement well for 01G as the well has been experiencing diminished capacity due to deterioration of the screen. The replacement well is located immediately adjacent to (within 50 feet of) the College Highway Well (01G) and the Zone II recharge area will be the same. The well has a Zone I protective radius of 400 feet and approved withdrawal rate of 0.792 MGD. The Zone I includes a small area of College Highway and an undeveloped field. The Zone II was delineated utilizing data developed during an extended duration pumping test, geological mapping and analytical modelling.

The aquifer is part of the Barnes Aquifer, an extensive sand and gravel aquifer that has been designated by the EPA as a "Sole Source Aquifer". The aquifer extends through Holyoke, Westfield, Southampton and Easthampton. The Zone II for the College Highway well is aerially extensive and extends through Southampton and into Westfield to the south. The Barnes Aquifer Protection Committee consists of representatives of each of the communities to work together on a regional basis to promote education about and protection of the aquifer. The well is located downgradient (north) of a point at which two, one-half mile wide, buried valley (Manhan River and Moose Brook) aquifers merge and discharge further to the north and east into the Connecticut River Valley. The aquifer is comprised of glacially deepened bedrock valleys that were filled with sand and gravel during the glacial recession (melting) some 10,000 years ago. Glacial Lake Hitchcock was formed throughout much of the Connecticut River Valley leaving some areas with an extensive clay confining unit. The College Highway well is a flowing artesian well due to a thick, confined clay unit located in the immediate vicinity of the well. However, the confining clay unit thins out and is non-existent in some portions of the Zone II. Much of the recharge to the aquifer occurs in the unconfined portions of the aquifer and some potentially from the bedrock.

The wells are located in an aquifer with a high vulnerability to contamination due to the absence of a continuous hydrogeologic barrier (i.e. clay) that can prevent contaminant migration from the ground surface. Please refer to the attached map to view the boundaries of the Zone II.

Water from the College Highway well is not treated prior to distribution. Soda ash is added to the water from the Holyoke surface water supply to adjust the pH for corrosion control and disinfected with chlorine prior to distribution. For current information on water quality and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Southampton has primarily residential and agricultural land uses; there are a few commercial, and some industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning
7. Agricultural activities
8. Rights-of-Way

The overall ranking of susceptibility to contamination for the system is high, based on the presence of several high threat land uses within the water supply protection areas, as seen in Table 2. However, there are numerous safeguards in place to minimize the threat from some of the potential threats. The following summarizes the potential threats and recommendations.

**1. Non-conforming Zone I** – The Zone I for the well is a 400 foot radius around the wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's promulgation of regulations and contain non water supply activities such as homes and public roads. The Zone I for well 01G and the replacement well extends into College Highway. It is unlikely that the Water Department will be able to acquire ownership of the entire Zone I. The Water Department owns the remaining land area within the Zone I for the wells.

### Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

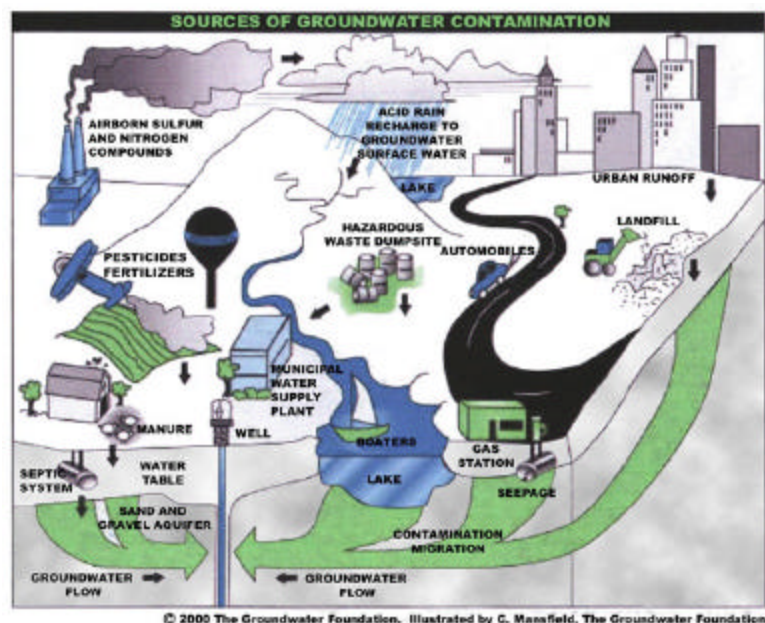
**2. Residential Land Uses** – Approximately 14% of the Zone II land area is residential. The entire Zone II, with the exception of that one commercial area on the northern edge of the Zone II is served by on-site septic disposal systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

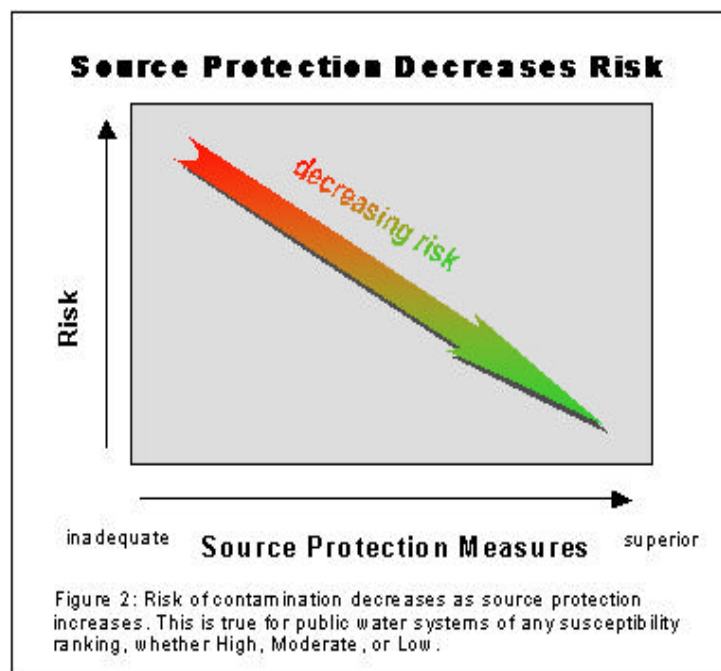
### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** – Many state routes run through the Zone IIs of the wells. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone IIs.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone IIs can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Notify City and town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Dairy Farms	2	M	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use orchards/crops	Several	M	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations other than dairy	3	M	Manure (microbial contaminants): improper handling
Pesticide Storage or Use Orchards/crops	Several	H	Pesticides: leaks, spills, improper handling, or over-application
Pesticide/Fertilizer Storage—Farm store	1	H	Leaks, spills, improper handling
<b>Commercial</b>			
Cemeteries	1	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Furniture Stripping and Refinishing	1	H	Hazardous chemicals: spills, leaks, or improper handling
Gas Stations	1	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Golf Courses	1	M	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	5	H	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Medical Facilities	1	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Hazardous Materials Storage	Several	H	Hazardous materials: spills, leaks, or improper handling or storage
Confirmed Hazardous Waste Sites	2	-	Refer questions to Bureau of Waste Site Cleanup

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Industrial</b>			
Forestry Operation—Sawmill	1	M	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
<b>Miscellaneous</b>			
Clandestine Dumping	Numerous	H	Debris containing hazardous materials or wastes
Landfills (closed/capped)	1	H	Seepage of leachate
Small quantity hazardous waste generators	Numerous	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Rights-of-Way - Type: Natural gas	1	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	4	H	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	Numerous	L	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Railroad Tracks	1 spur	H	Herbicides; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



- ✓ Storm Drain Stenciling Program - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>

**4. Hazardous Materials Storage and Use** – A small percentage (less than 1%) of the land area within the Zone IIs is commercial/industrial land use. Even though it is a small percentage of land use, many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store hazardous materials in UST/AST (see Appendix B for a list of registered facilities). If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships among businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ Promulgate a local hazardous materials handling regulation, conduct routine inspections and provide assistance to businesses.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ex.4.

**5. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water is a place people want to live and businesses want to locate.



indicated on the map as Release Tracking Numbers 1-0011448 and 1-0000264. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

**6. Agricultural Activities** – There are several farms within the Zone IIs. Approximately 29% of the land use within each of the Zone IIs is as cropland and pasturelands. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage the farmers and golf course managers to incorporate an Integrated



Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.

- ✓ Work with farmers, nurseries, and golf courses to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**7. Protection Planning** – Currently, the Town has water supply protection controls. However they do not meet DEP's Wellhead Protection regulation 310 CMR 22.21(2). In addition, the Easthampton water supply Zone II is within Southamptton but that area is not protected by Southamptton's bylaws. Westfield does have an ordinance protecting Southamptton's Zone II. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulation 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulation, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).

**8. Rights-of-Way** – There are two rights-of-way within the Zone IIs: railroad and electric. Rail corridors that serve passenger and/or freight trains are a potential source of contamination due to chemicals released during normal use, track maintenance, and accidents. Leaks or spills of transported chemicals or train/track maintenance chemicals are also potential sources of contamination to the water supply. Normal maintenance of any right-of-way, including electrical line rights-of-way, can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides is a potential source of contamination.

**Rights-of-Way Recommendations:**

- ✓ Review the railroad and electricity right-of-way Yearly Operating Plan to

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

**Additional Information**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utilities use, and provide them with up-to-date maps if necessary.

- ✓ Work with your local fire department to review emergency response plans. Updates to this plan should include the railroad rights-of-way including coordination with the owner/operator of the pipeline, electricity lines, and track and trains using the right-of-way.
- ✓ Request emergency response teams to coordinate Emergency Response Drills and practice containment of potential contaminants from train accidents within the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. There are several salvage yards and junk yards within the Zone II. [The Board of Health is aware of these areas and is considering various actions to minimize or eliminate the threat from these facilities.](#) Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Inventorying many of the land uses throughout the Zone II.
- Persistent efforts resulting in the removal of a 125,000 tire pile, 500 yards from the well at a cost of more than 3 million dollars.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Coordinate and implement a plan for Easthampton and surrounding communities to remove underground storage tanks to protect the unconfined aquifer from contamination.
- ✓ Monitor progress on any ongoing remedial action conducted for the known contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

#### **➤ Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use, regulations related to watersheds and groundwater protection. These controls may include health

ordinances/regulations, discharge prohibitions, general ordinances, and zoning bylaws/ordinances that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning By -laws/Ordinances, Health Regulations, and General By -laws/Ordinances)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>Partial</b>	The Town does have wellhead protection by-laws but they do not meet DEP regulatory requirements. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model by-laws and health regulations and continue efforts to pass by-laws.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>YES</b>	Westfield has ordinances protecting the aquifer.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>NO</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>Partial</b>	For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Southwick Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Southwick Water Department
<i>PWS Address</i>	454 College Highway
<i>City/Town</i>	Southwick, MA 01077
<i>PWS ID Number</i>	1279000
<i>Local Contact</i>	Mr. Peter Jakobowski
<i>Phone Number</i>	(413) 569-6772

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

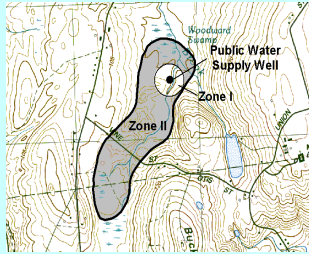
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*MA GIS Zone II #: 320*

*Susceptibility: High*

<i>Well Names</i>	<i>Source IDs</i>
Well #1 (Great Brook Well)	1279000-01G

The Town of Southwick is a growing, rural residential community in south western Massachusetts along the Connecticut border. Southwick has recreational activities in the Congamond Lake region and increased pressure in residential, light industry and commercial development. The Southwick Water Department is served by a single source, well #1 (01G). During times of peak demand, water is purchased from the Springfield Water & Sewer Commission system. A separate SWAP report has been completed for the Springfield water system and is attached to this report. The well is located in the northeastern section of Southwick near Feeding Hills Road. The Zone I for the well is a 400 foot radial area and the Zone II recharge area was delineated utilizing empirical data, analytical modeling and geologic mapping. The aquifer is an extensive, very productive, unconfined, sand and gravel, buried valley aquifer; there is no evidence of a confining clay layer in the aquifer. Groundwater flows north to the Westfield River and two other community supplies withdraw from the same aquifer. The source (01G) has an approved maximum daily withdrawal rate of 1.02 million gallons per day (mgd) and a Water Management Act Registration and Permit to withdraw an average, annual daily withdrawal of 0.69 mgd based on historic and projected demand. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

The well water does not receive treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone II for Southwick is a mixture of forest, residential and agricultural land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Nonconforming activities in Zone I
2. Residential land uses
3. Transportation corridors and right of way
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection area, as seen in Table 2.



**1. Nonconforming Activities in Zone I** – The Zone I for the well is a 400 foot radius around the wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Southwick Water Department owns or controls the entire Zone I area. Presently, only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The Zone I for the system's well contains an area previously used for sand and gravel mining.

**Zone I Recommendations:**

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Control access and keep all new non water supply activities out of the Zone I.

**2. Residential Land Uses** – Approximately 13% of the Zone II contains residential areas with 8% being high density residential development around the lakes. The Town is in the process of installing municipal sewers along the west side of the Zone II area that will eventually include the lakes area. Presently the majority of the area utilizes on-site septic systems. It appears from the proposed plans that most of the Lakes area will be served by municipal sewer. However, the schools are not at this time proposed to be included. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products

used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

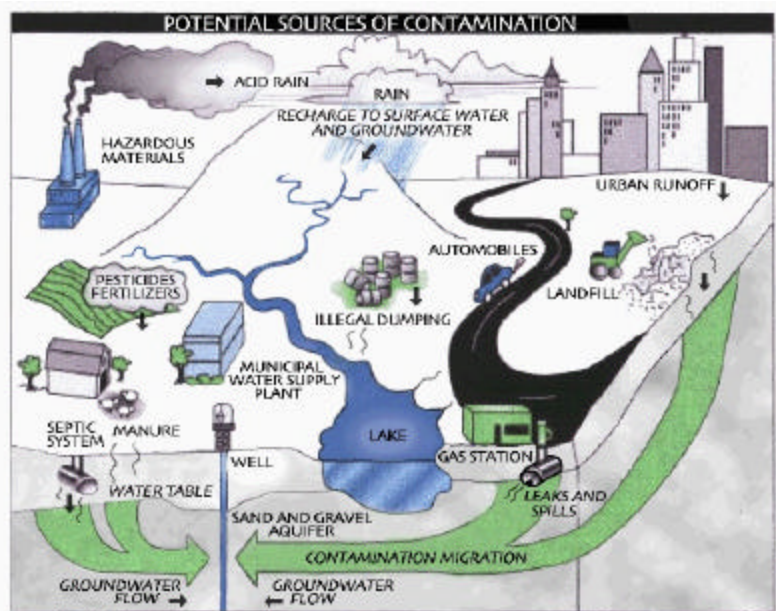
- ✓ Educate residents on best management

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors and Right of Way** - Local roads run throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and washed into catch basins.

A natural gas right of way also run through the watershed. Normal maintenance of any right of way can introduce contaminants to a water supply through herbicide application for vegetation control. The over-application or improper handling of herbicides on right of ways is a potential source of contamination.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and properly cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency

response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Notify town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).
- ✓ Storm Drain Stenciling Program - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.

**Right of Way Recommendations:**

- ✓ Review the right of way Yearly Operating Plan (YOP) for utilities to ensure best management practices are implemented with regard to vegetation control and that the utility has accurate information regarding the locations of the protection zones. Review the

*(Continued on page 6)*

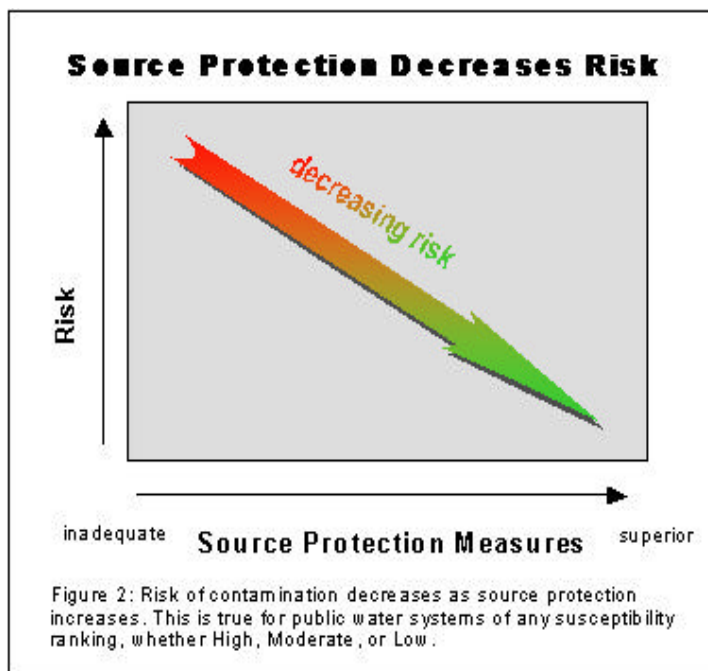
**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agricultural</b>			
Fertilizer Storage or Use	2	M	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	2	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>			
Bus Terminals	1	H	Fuels and maintenance chemicals: spills, leaks, or improper handling.
Sand & Gravel Operation	1	M	Fuels and maintenance chemicals: spills, leaks, or improper handling.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Schools	3	M	Laboratory, art, photographic, machine shop, cleaning and other chemicals: spills, leaks, or improper handling or storage
Hazardous Waste Generator	—	M	Note: The Schools and Bus Garage are currently registered hazardous waste generators. The Garage does have an industrial holding tank. Hazardous materials spills, discharges, leaks, or improper handling or storage.

**Notes:**

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ maps the utilities use.
- ✓ Continue current efforts toward working with local emergency response planners. Be sure that local emergency response teams are aware of the protection areas and coordinate Emergency Response Drills.

**4. Hazardous Materials Storage and Use** – The Zone II contains facilities that store or use hazardous materials. Many small businesses, schools, and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/ASTs. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

The schools and bus maintenance facility are served by on-site septic system. The bus maintenance facility is presently permitted for an industrial holding tank. There is no record of the facility being registered as a hazardous waste generator. The schools all utilize on-site septic and there is no record of a separate tank for the laboratory wastewater.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with the Board of Health, local businesses and facilities to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. If it is needed, funding may be available for the school and bus terminal. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ex.4.



**5. Agricultural Activities** – There is pastureland on the western edge of the Zone II and cropland on the eastern edge of the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Commercial facilities may be eligible for funding BMPs through the Department of Food and Agriculture or the NRCS. Contact the NRCS about the Environmental Quality Incentives Program (EQIP).

**6. Protection Planning** – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that

*(Continued on page 7)*



supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

#### **Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local schools and businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

**➤ Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

**➤ Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

**➤ Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

**➤ Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, include adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning bylaws that prohibit or control potential sources of contamination within the protection areas.

**➤ Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: when funds are available, each spring DEP posts a new Request for Response for the grant program (RFR).

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection



**Table 3: Current Protection and Recommendations**

<b>Protection Measures</b>	<b>Status</b>	<b>Recommendations</b>
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone I.
<b>Municipal Controls</b> (Zoning By -laws, Health Regulations, and General By-laws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>YES</b>	The Town "Aquifer Protection District" bylaw meets DEP's 310 CMR 22.21(2).
Do neighboring communities protect the Zone II areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Southwick does have a bylaw that complies with DEP regulation. Supplement that protection with a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Continue the current coordination of emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizen groups, planning groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Adopt hazardous materials and UIC regulations and conduct inspections of industries in town.
Does the PWS provide wellhead protection education?	<b>YES</b>	Continue current efforts in education.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
50494	Powder Mill Middle School	94 Powder Hill Rd	Southwick	Plant	Air Quality Permit Minor	School
211896	School Bus Maintenance Garage	Powder Mill Rd	Southwick	Industrial Wastewater	IWW Holding Tank	Maintenance Garage
378253	Southwick Tolland Regional Schools	80b Powder Mill Rd	Southwick	Handler	Small Quantity Generator Waste Oil/PCBs	Maintenance Garage

### Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Saunder's Boat Livery Inc.	120 Congamond Rd	Southwick	Boat Livery	1 Wall	Approved In-Tank Monitor	4000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)**

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0014428	97 Feeding Hills Road	Southwick	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
SODOM MOUNTAIN CAMPGROUND



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 25, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Sodom Mountain Campground
<i>PWS Address</i>	233 South Loomis St
<i>City/Town</i>	Southwick, Massachusetts
<i>PWS ID Number</i>	1279002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1279002-01G	258	650	High	Moderate
Well #2	1279002-02G	100	410	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

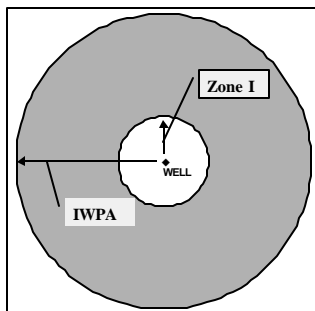
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1279002-01G)**

Zone I = 258 ft.  
IWPA = 650 ft.



### How Was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone Is and/or the IWPAs. The **moderate** susceptibility to potential non-microbial threats is based on the parking areas within the Zone Is and/or the IWPAs.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, a Sanitary Survey, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment and Protection (SWAP) Report for The Ranch Golf Club

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

Date Prepared:  
June 3, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>The Ranch Golf Club</b>
<i>PWS Address</i>	<b>65 Sunnyside Ranch Road</b>
<i>City/Town</i>	<b>Southwick, Massachusetts</b>
<i>PWS ID Number</i>	<b>1279003</b>
<i>Local Contact</i>	<b>Mr. William Barton</b>
<i>Phone Number</i>	<b>800-340-6041</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1279003-01G	183	488	Moderate
Well #2	1279003-02G	100	424	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Ranch Golf Club is an 18-hole golf course and clubhouse located in the town of Southwick, a small primarily agricultural/residential community with some industrial land uses, located in southwestern Massachusetts along the Connecticut border. The Ranch owns and operates two water supply sources. Well #1 (01G) serves the maintenance shop and clubhouse and Well #2 (02G) serves a small bathroom on the north side of the course.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPA radii for the Ranch wells were based on approved pumping rates determined following extended duration pumping tests conducted on each well as part of the New Source Approval process. The Zone I and IWPA for Well #1 are 183 feet and 488 feet, respectively. The Zone I and IWPA for Well #2 are 100 feet and 424 feet, respectively. The wells were approved through the NSA and therefore are in compliance with the Zone I requirement that prohibits all but water supply activities from the Zone I. Please refer to the attached map of the Zone I and IWPA.

Geologic mapping of the area indicates the overburden material at the site is glacial till of varying thickness; the underlying bedrock aquifer from which the wells withdraw is composed of the Deerfield Arkose, which is equivalent to the New Haven Arkose of the Triassic Period. Although there is some material overlying the bedrock aquifer utilized by the Ranch sources, there is no evidence of a significant hydraulic barrier at the surface. Wells located in these geologic conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for the wells include few activities that pose significant threats to the aquifer. There are a few residences and the golf course within the IWPA.

#### Key issues include:

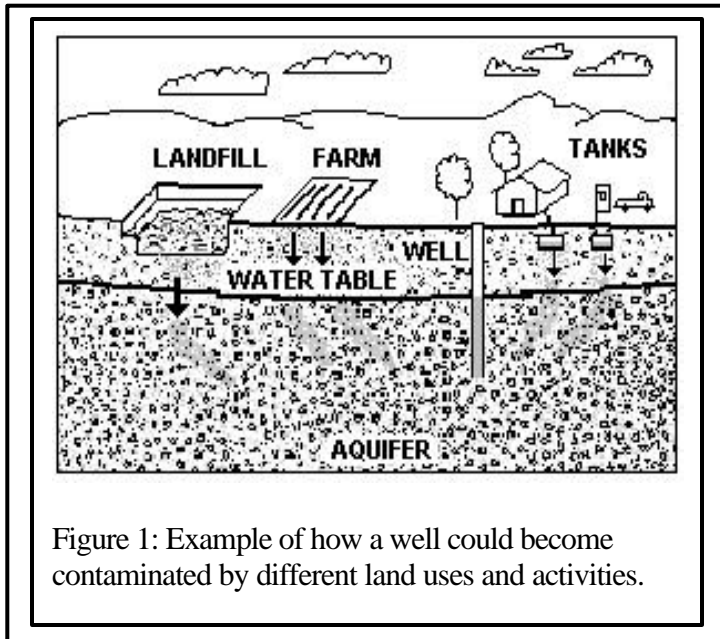
1. **Golf course**
2. **Transportation corridor**
3. **Residential land use**

The overall ranking of susceptibility to contamination for the Ranch water supply wells is moderate based on the presence of several moderate ranked potentially threatening

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Golf course	No	Yes	Moderate	Integrated Pest Management should be used at the course. Review regulatory restrictions of pesticides in IWPA's.
Transportation corridor	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential development	No	Yes	Moderate	Supply BMPs to residents
Septic	No	Yes	Moderate	Supply BMPs to residents.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



land uses or activities in the IWPA. Continued monitoring and use of Best Management Practices (BMPs) is recommended to prevent accidents and minimize threats within the protection areas of the wellhead. Please note that the well cap on Well #2 at the time of the assessment was not a sanitary or secure well cap and there was soil slumping around the well casing providing a potential conduit for surface runoff to impact the well. It is recommended that you replace the cap prior to the first seasonal sampling of the well and correct the drainage around the wellhead to provide drainage away from the casing. In addition, there is a small intermittent drainage area adjacent to Well #2. Be sure that seasonal and intermittent drainage does not flow toward the wellhead.

**1. Golf course** – The system is part of a golf course. Pesticides, fertilizers and hazardous materials utilized as part of the normal operation of a course, have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Very often golf courses have maintenance garages for

equipment and may have storage tanks for hazardous materials. The Ranch is not registered as a hazardous waste generator. The maintenance garage is located outside of the protection areas and topographically downgradient from the wells. However, as noted previously, the IWPA does not provide a scientific determination of the contribution area to a well. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. We recommend the use of BMPs for all activities that are a potential source of contamination.

#### **Golf Course Recommendations:**

- ✓ Incorporate an Integrated Pest Management (IPM) approach into the course management program. IPM is an ecologically based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Pesticide applicators at the course must be made aware of the IWPA areas. The Massachusetts Pesticide Bureau regulates products that may be applied in water supply protection areas.
- ✓ Review the use of hazardous materials in the maintenance facility and determine if the facility should be registered as a hazardous waste generator.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Transportation corridor** – Well #2 is located adjacent to a rural residential road. The potential threats from the road are deicing materials, runoff, accidental spills or access by the public.

#### **Recommendations:**

- ✓ Work with the Town to ensure that road runoff is directed where feasible, to an area downgradient (southeast) of the well.
- ✓ Prepare an Emergency Response Plan that includes coordination among the DEP, the Water Department, the Town and State Police in the event of an accident near the wellhead.

**3. Residential Land Uses** – There are few residences located within the protection area. None of the areas have public sewers to treat wastewater; therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they might be a potential source of microbial contamination.

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catchbasins transport stormwater from roadways and adjacent properties to the ground and streams. Flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

## Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

## 4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Please review and adopt the key recommendations above and the following:

### Priority Recommendations:

- ✓ Incorporate IPM into course management.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well. Secure caps, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Re-grade the area around the wellhead and ensure it slopes away from well casing. Any natural periodic drainage or runoff near the well should be controlled and directed away from the well.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.

### Planning:

- ✓ Work with local officials in Southwick to include the IWPA's into the Aquifer Protection District.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory

to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

Copies of this report have been forwarded to the water supplier and Town officials.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Springfield Water and Sewer Commission**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Springfield Water and Sewer Commission
<i>PWS Address</i>	P.O. Box 955
<i>City/Town</i>	Springfield
<i>PWS ID Number</i>	1281000
<i>Local Contact</i>	Mr. Douglas Borgatti
<i>Phone Number</i>	413-787-6256

### Introduction

We are all concerned about the quality of the water we drink. Drinking water reservoirs may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

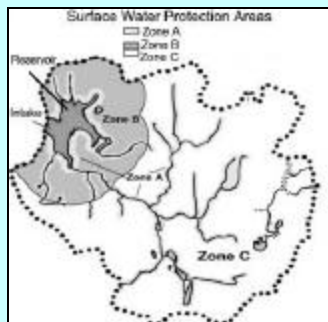
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

### *System Susceptibility:*

Moderate

<i>Source Name</i>	<i>Source ID</i>	<i>Susceptibility</i>
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Cobble Mountain Reservoir	1281000-02S	Moderate
Borden Brook Reservoir	1281000-04S	Moderate
Sedimentation Basin	1281000-05S	Moderate

Springfield, the largest municipality in western Massachusetts, is located in the Connecticut River Valley near the Connecticut border. Springfield Water and Sewer Commission (SWSC) provides water for the greater Springfield metropolitan area including Springfield, Agawam, Longmeadow, East Longmeadow and Ludlow; it also provides a back-up/supplemental supply for Southwick, Westfield and West Springfield. The SWSC utilizes the Cobble Mountain Reservoir system located in the Little River watershed partially located in the towns of Russell, Tolland, Blandford, Granville, Westfield and Otis. The system includes Cobble Mountain Reservoir (1281000-02S), the adjacent Borden Brook Reservoir (1281000-04S) and Sedimentation Basin (1281000-05S) located at the in-take to the water filtration plant, the West Parrish Filters. SWSC also maintains Ludlow Reservoir 1281000-01S as an Emergency Source. As a reserve for severe drought conditions, the SWSC also has water rights to 86 feet of water elevation from the Littleville Reservoir which is designated as an Emergency Source of water 1281000-03S. This report does not address the land uses in the Emergency Source watersheds.

The Cobble Mountain/Borden Brook watershed is located in the foothills of the Berkshires on the eastern side of the Berkshire Massif. The topography of the watershed consists primarily of steeply sloping brook valleys and rolling hills. The overburden material within the watershed is predominantly a thin cover of glacial till, often referred to as hard pan, with significant areas of exposed bedrock. Some of the brook valleys have limited deposits of glacial, stratified drift (sand and gravel) or recent alluvium which are locally mined. The bedrock in the watershed is mapped as several formations consisting of igneous and metamorphic rocks. The structural geology of the region is highly complex with four stages of folding and several faults resulting in numerous unconformities between rock types in the area.

The SWSC owns approximately 47% of the Cobble Mountain/Borden Brook system watershed; an additional 25% of the remaining watershed is forest or agriculture land (Chapter 61). Land use within the Cobble Mountain/Borden Brook watershed is primarily forested upland (nearly 80%) with the remaining watershed consisting of residential and agricultural activities (both commercial and non-commercial) such as crop land, animal husbandry and forestry; a small percentage of land is utilized as commercial and transportation related land use. The SWSC owns about 97% of Sedimentation Basin watershed; about 80% of the watershed is forest and the remaining land use is associated with water supply related activities. Please refer to the attached map to view the boundaries of the protective zones.

Water from the reservoirs is treated through a rapid sand or slow sand filtration



system, then chlorinated for disinfection and pH adjusted with soda ash for corrosion control. For current information on water quality monitoring results and treatment processes, please contact Katherine Pederson at 413-787-6256 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies the source is considered highly vulnerable to natural and anthropogenic potential contamination. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Residential land use
3. Transportation corridors and Rights-of-way
4. Agriculture and Golf course
5. Hazardous material handling
6. Protection planning

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone A** - The Zone A for a reservoir includes all areas within 400 feet of the reservoir shoreline and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Zone A is the area closest to the reservoir and its tributaries, therefore land uses within the Zone A are of particular concern. Activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc.

The SWSC owns or controls 95% of the Zone A land around the reservoirs and 47% of the total watershed lands. The following activities occur in the Zone A of the system's reservoirs:

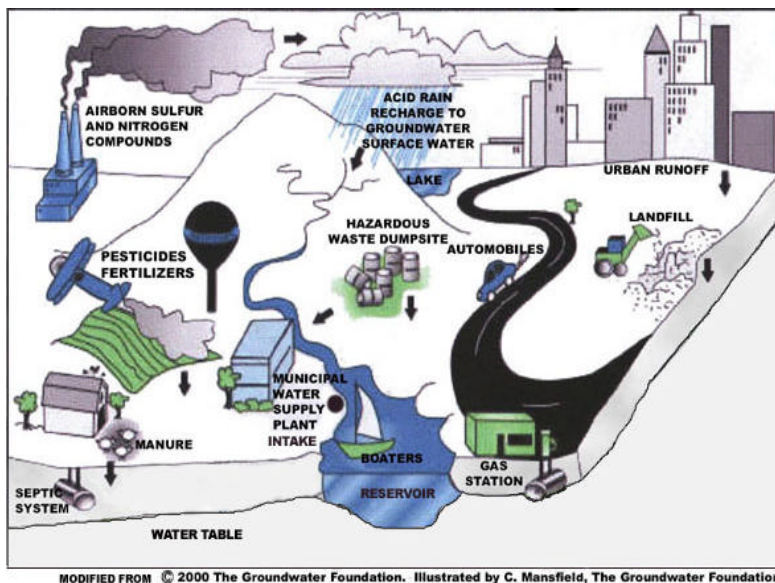
**Cobble Mountain Reservoir (02S)** - Activities include: state and interstate highways, local roads, agriculture, residential homes (all of which are on private septic systems), utility rights-of-way, a hydroelectric generation station, two gravel pit operations and a few commercial facilities. Most of these activities, with the exception of the hydroelectric generation station and the SWSC gravel pit, occur within the Zone A of tributary streams remote from the reservoir. The transformers at the hydroelectric generation facility have been relocated outside of the Zone A and a

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Figure 1: Sample watershed with examples of potential sources of contamination

decreased hazard mineral oil is used in oil-bearing machinery. In addition, stormwater runoff at the facility has been addressed by reconstruction of the access road and the installation of an oil-water separator and deep sump catch basins. A tarmac drain still exists on the access road, posing a potential threat in the event of an accident. However, the facility upgrades have significantly improved source protection at the facility. The facility is a very small quantity hazardous waste generator and must maintain best management practices and exceptional housekeeping to protect the source.

The SWSC owns three gravel pits, but uses them infrequently. Two pits are located within the Zone A. The threat associated with gravel operations include: petroleum products from equipment used or stored on site, erosion and runoff from the facility, access by off-road vehicles and illegal dumping of potentially harmful materials.

**Borden Brook Reservoir (04S)** - Activities include local roads, agriculture, residential homes (utilizing private septic systems), and at least one small commercial facility. The resident manager's home is located within the Zone A of Borden Brook Reservoir. That facility has a single family residence and a maintenance garage with four above ground petroleum storage tanks. The two diesel tanks for equipment refueling located at the maintenance garage have secondary containment and a roof over the tanks; the other two fuel oil tanks located in the basement of the residence do not have containment and the fuel lines are not sleeved, however, the floor is cement, there are no cracks and there are no floor drains. There is only minor maintenance work conducted at the garage with waste oil stored on a containment pallet. The small amounts of fuel (gasoline) kept on-site is stored in a metal "flammables" cabinet. The Borden Brook garage is not a registered hazardous waste generator.

**Sedimentation Basin (05S)** - The Zone A extends 400 feet downstream of the intake structure on Sedimentation Basin. Therefore, the land use table on the

SWAP map indicates activities other than forest and water within the Zone A of Sedimentation Basin. However, only water supply activities are conducted in the watershed and all of the treatment facilities are located downgradient of the pond, outside of the watershed.

#### Zone A Recommendations:

- ✓ To the extent possible, remove all prohibited activities from the Zone A to comply with DEP's Zone A requirements.
- ✓ To the extent feasible, remove all petroleum products from the Zone A. For those facilities that are required, provide containment for fuel oil and sleeve delivery lines. Monitor delivery of products and removal of waste products.
- ✓ Review the use of hazardous materials and amount of waste generated to determine if registration is warranted.
- ✓ Continue the current use of BMPs for the storage, use, and disposal of hazardous materials such as maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road deicing materials within the Zone A should be covered and contained.



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### Source Protection Decreases Risk

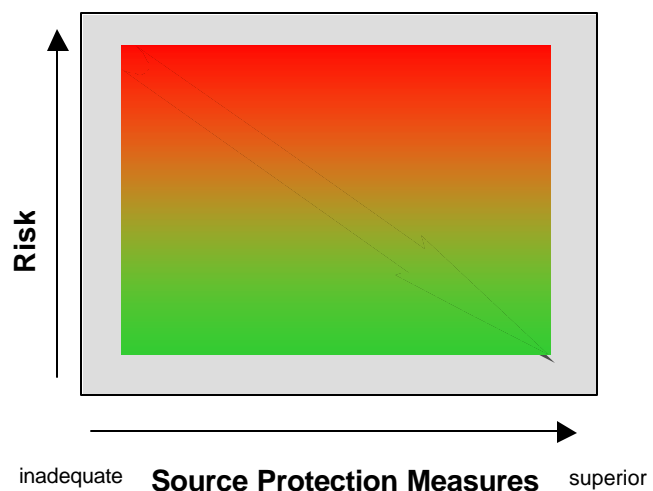


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watersheds**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
<b>Agricultural</b>				
Livestock Operations (commercial and non-commercial)	12	M	02S, 04S	Manure (microbial contaminants, nutrients): improper handling, erosion.
Forestry Operations	Numerous	M	02S, 04S	Leaks and spills, improper handling of petroleum products in equipment. Erosion.
Nurseries	1	M	02S	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application.
Agriculture—Pesticide/Fertilizer Storage or Use	Numerous	M	02S, 04S	Pesticides/fertilizers: leaks, spills, improper handling, or over-application. Petroleum products management for equipment.
<b>Commercial</b>				
Cemeteries	3	L	02S, 04S	Pesticide usage, historic embalming fluids. Spills from lawn equipment, management of petroleum products.
Confirmed Oil or Hazardous Material Release Sites	1	--	02S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Garage/Depots	3	M	02S	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage.
Schools	1	M	02S	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage.
Very Small/Small Quantity Hazardous Waste Generators	Few	M	02S	Hazardous materials and waste: spills, leaks, or improper handling or storage.
Quarry/Mining	4	M	02S, 04S	Petroleum products and waste: spills, leaks, or improper handling or storage. Illegal dumping and erosion.
Hazardous Materials Storage/Use	Few	M	02S	Hazardous materials and waste: spills, leaks, or improper handling or storage.

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
<b>Miscellaneous</b>				
Stormwater Drains/ Retention Basins	Numerous	L	02S, 04S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns.
Residential	Numerous	M	02S, 04S	Fuel oil: spills, leaks, or improper handling. Household hazardous materials, fertilizers, pesticides, etc.
Transportation Corridors	Numerous	M	02S, 04S	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling.
Underground Storage Tanks	12	M	02S	Stored materials: spills, leaks, or improper handling.
Aboveground Storage Tanks	Numerous	M	02S, 04S	Stored materials: spills, leaks, or improper handling.
Utility Rights-of-Way	2	L/M	02S, 04S	SWSC has requested that utilities do not use pesticides.

**Table 2 Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ To the extent possible, inform landowners within the Zone A regarding the use of BMPs.
- ✓ Prohibit all new non-water supply activities from the Zone A.
- ✓ Continue increased patrols and enforce the no trespassing requirement.
- ✓ Continue the practice of prioritizing land to be acquired. Acquiring land and/or acquiring conservation easements is critical to source protection.
- ✓ Closely monitor activities at the hydroelectric generation station to ensure the use of BMPs and good housekeeping practices.
- ✓ Review the Spill Prevention Control and Countermeasure Plan (SPCC) for the hydroelectric generation station with the utility to be sure it includes specific response plans in the event of an accident either inside or on the access road to the facility. Ensure the plan is readily available and staff are familiar with the plan.
- ✓ Carefully manage all activities at the gravel pit operations within the Zone A, specifically erosion. Implement BMPs for the storage, use, and disposal of hazardous materials related to equipment. Control access to prohibit off road vehicles and dumping.
- ✓ Where it is appropriate, consider developing a closure plan for unused portions of the gravel pits and for long term reclamation to minimize erosion and prevent trespassing.

**2. Residential Land Uses** – There are numerous residences located within the Cobble Mountain and Borden Brook Reservoir watersheds. None of the areas have public sewers to treat wastewater, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Continue current efforts of negotiating fee simple purchase, Right of First refusal agreement, conservation restrictions and Memorandum of Understanding for land not currently owned or controlled by the SWSC.
- ✓ Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**Top 5 Reasons to Develop a Local Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

**3. Transportation Corridors and Rights-of-way** - The Massachusetts Turnpike runs through the northern edge of the Cobble Mountain watershed. There are also numerous local roads throughout both the Cobble Mountain and the Borden Brook watersheds, including many dirt roads. Although most roadways in the watersheds are relatively low-use, even typical roadway maintenance and low use pose a potentially significant source of contamination from accidents and washouts along both the paved and dirt roads, especially in the Zone A. Larger, heavily traveled roads pose a greater threat. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater, washed and discharge into the feeder streams and reservoirs. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the reservoirs. Clandestine dumping is identified as a significant threat to water supplies because roadways can be sites for illegal dumping of hazardous or other potentially harmful wastes. The SWSC has closed off access to one of the roadways near the reservoir, reducing illegal dumping that had occurred at that location.

There are numerous unpaved roadways as well as legal (authorized) and illegal (unauthorized) trails throughout the watershed. Erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs,



potentially resulting in additional water treatment costs if they continue unchecked. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. SWSC does not allow public access to their watershed land except by License Agreement, or under the terms of the Massachusetts Department of Environmental Management (DEM) Conservation Restriction purchased on 1,450 acres. Unmanaged access may result in vandalism and/or illegal dumping which might cause water quality impairment.

The SWSC has an approved Surface Water Protection Plan and a Watershed Management Program. The SWSC's watershed management strategy included hiring a forester who also is the resident site manager and conducts watershed inspections. The plan also includes continued forest management, prioritizing road and trail maintenance, and watershed access control. The team is preparing an inventory of the existing conditions within the watershed and it has determined numerous areas of uncontrolled access and erosion problems. The team will develop and implement BMPs including the replacement of culverts or the use of temporary bridges. The SWSC maintains a "no access without written permission" policy for all but the 1,450 acres of land most recently purchased through the Aquifer Land Acquisition (ALA) program. Access to the land purchased through ALA funding is governed by the DEM Conservation Restriction that details allowable activities and public access to that land; there is no formal access management plan.

Electric and natural gas rights-of-way also run through the watershed. Normal maintenance of any right-of-way can introduce contaminants to a water supply through herbicide application for vegetation control. The SWSC has requested that utilities use only mechanical methods to control vegetation on rights-of-way within the Little River watershed.

#### **Transportation Corridor Recommendations:**

- ✓ Continue regular inspection of watersheds for signs of access, illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Continue current efforts toward working with host communities and the MAHD to have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps are not yet available, work with town and State officials to investigate mapping options. This recommendation applies primarily to Route 23 and the Turnpike.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Continue increased patrols of watershed land and enforce no trespassing.
- ✓ Notify community officials within your watershed of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural Development Manager at the local office in Hadley at 413-585-1000. Review the fact sheet available online and call the NRCS office in Amherst 413-253-4350 for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Continue investigating disposition of all roads, ways and "trails" and pursue as appropriate, closing or controlling access.
- ✓ Evaluate existing conditions throughout the watershed with respect to current illegal use of watershed land. Determine where access is being gained and the destination points to facilitate development of a management

#### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

strategy to eliminate or control access. As appropriate, coordinate management strategies with the communities within the watersheds.

- ✓ Continue to evaluate past forest management practice and update a water supply forest management plan as appropriate.

#### **Rights-of-way Recommendations:**

- ✓ Continue current practice of reviewing the right-of-way Yearly Operating Plan (YOP) for utilities to ensure they continue use of only manual control of vegetation and that the utility has accurate information regarding the locations of the protection zones. Review the maps the utilities use.
- ✓ Continue current efforts toward working with local emergency response planners. Be sure that local emergency response teams are aware of the protection areas and coordinate Emergency Response Drills.

#### **4. Agricultural Activities and Golf Course** – The watersheds include a small



percentage, approximately 3%, of land for agricultural activities and a golf course. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Frequently, farms and golf courses have maintenance garages for equipment and storage tanks.

**Agricultural Activities and Golf Course Recommendations:**

- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online and call the local office of the NRCS in Hadley at 413-585-1000 for assistance or online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers and golf course managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Continue your current work with farmers, and include nurseries and the golf course to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. This may be appropriate for host communities.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**5. Protection Planning** – The SWSC has an approved Water Supply Protection Plan, however, plans periodically require updating to reflect completed tasks and new conditions. An updated plan has recently been submitted to the Department for review. An effective overall protection plan will not only include detailed land use, but also includes: coordinated community efforts which identify protection strategies, establishing a timeframe for implementation, and provides a forum for public education and outreach. The watershed is primarily woodland with a large portion of the land managed through forestry operations. Good forest management of both SWSC land and private land can beneficially impact water quality and health of the watershed forests.

**Protection Planning Recommendations:**

- ✓ Continue active watershed protection planning and forest management for water supply protection in a comprehensive watershed plan.
- ✓ Encourage and support efforts by private land owners in active forest management for water supply protection.
- ✓ Continue working with communities and their local officials and boards in the watershed in active watershed protection planning and education efforts.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step toward protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- re-establishing a resident manager at the reservoir,
- investigating the legal disposition of roads and ways in the watershed and controlling access to the watershed,
- active involvement in inspecting and inventorying land uses in the watershed,
- proactive involvement with host communities by assisting with grant proposals for watershed protection projects,
- proactive land acquisition and acquisition of conservation restrictions to control activities in the Zone As, and
- fostering cooperative relationships with communities and land owners within the watersheds.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue inspection of the Zone A protection areas regularly, and when feasible, remove or manage any non-water supply activities, specifically the maintenance activities and fuel oil storage in Zone A.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue cooperation and communication with emergency response teams to ensure that they are aware of the boundaries of the watershed for notification of spills or accidents.
- ✓ Continue working with landowners in your protection areas to make them aware of your water supply and to encourage the use of best management practices for residential and recreational uses.
- ✓ Update the Watershed Protection Plan for water supply protection to include a management plan for the areas open to public access.
- ✓ Evaluate stormwater drainage specifically in the Zone A along roads throughout the watershed. Make every effort to ensure stormwater discharges and run-off is detained prior to release to protection areas. Consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of tributaries and the reservoirs.
- ✓ If local controls do not regulate floor drains, encourage communities to adopt floor drain controls and hazardous waste management strategies.
- ✓ Request that local highway departments inspect, maintain, and clean catch basins on a regular schedule.
- ✓ Continue a forest management program to establish a healthy and ideal watershed forest, which will buffer anthropogenic and natural environmental impacts on water quality and quantity.
- ✓ In locations where residential and commercial land uses are within the Zone A, consider conducting stream flow and water quality monitoring to determine potential effects of these activities on water quality.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues, above and in Appendix A.

#### ➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### ➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to water supply contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

#### ➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the source protection areas are located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

#### ➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use and regulations related to watershed protection. These controls may include health regulations, discharge prohibitions, general ordinances, and zoning bylaws/ordinances that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=equip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office (Hadley 413-585-1000) of the NRCS for assistance or online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. The Department's Grant Programs provide funds to assist public water suppliers and their partners in addressing various local projects. Protection recommendations discussed in this document may be eligible for funding under these grant programs. If funds are available, each spring DEP posts a new Request for Response (RFR) for the grant programs. Visit the DEP online at <http://www.state.ma.us/dep/brp/mf/othergrt.htm> and <http://www.state.ma.us/dep/brp/dws/grants.htm> for information about available funds.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help establish local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to establish priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Areas
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>YES (95%)</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue efforts to acquire critical land for protection.
Is the Zone A posted with "Public Drinking Water Supply" or "No Trespassing" signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue regular inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone As.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, Ordinances and General Bylaws)		
Do the watershed municipalities have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>NO</b>	Granville is working on an Open Space Plan to address land use in the town. The Blandford Watershed Protection bylaw for the Long Pond watershed complies with DEP's regulation. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws, health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include the watershed in their protection controls.
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>YES</b>	Update the Plan as appropriate to address newly identified threats and to adjust protection priorities as tasks are completed.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Update the Plan as appropriate by developing a joint emergency response plan with the Fire Department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. Complete vulnerability assessment as appropriate for the system.
Does the municipality have a watershed protection committee?	<b>NO</b>	Consider establishing a committee that includes representatives from citizens' groups, communities that your watershed is within, and the business community.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . However, there are very few hazardous materials users in the watershed.
Does the PWS provide watershed protection education?	<b>YES</b>	Aim additional efforts at commercial, industrial and municipal uses within the watershed.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
38152	Ma Turnpike Auth	Old Chester Rd Blandford Maint	Blandford	Hazardous Waste Generator	SQG-MA	Highway Maintenance Garage
				Hazardous Waste Generator	VSQG	
178320	Mobil Oil Corp SS Ken	Mm 29 - Ma Tnpk East Bound	Blandford	Hazardous Waste Generator	VSQG	Garage
38152	MTA Blandford Maintenance Depot	Mass Tnpk East Mm 26, Old Chester Rd	Blandford	Fuel Dispenser	Fuel Dispenser	Gasoline Station
366334	Circle K Store 2704492	Mass Turnpike East Mm 29.1	Blandford	Fuel Dispenser	Fuel Dispenser	Gasoline Station
MAV000016827	Town Of Blandford, Hwy Dept.	Otis Road	Blandford	Hazardous Waste Generator	VSQG	Garage
	Chester Granite Company	Algerie Road	Blandford	Hazardous Waste Generator	VSQG	Earth Removal/ Mining
MAV000018678	Northeast Generation Services Co.	Cobble Mountain Station	Granville	Hazardous Waste Generator	VSQG	Power Generation Station

## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Blandford Maintenance Depot	Old Chester Rd	Blandford	Mass Turnpike Authority			6,000	Waste Water
				2 Walls	Interstitial Monitoring	4,000	Heating Oil
				2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000	Diesel
Tosco #2704492	Mm 29 Mass' Pike Eastbound	Blandford	Tosco Refining Lp	2 Walls	Interstitial Monitoring	6,000	Diesel
				2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000	Gasoline
				2 Walls	Interstitial Monitoring	10,000	Gasoline
						550	Waste oil
Town Of Blandford Hwy Dept	114 Otis Rd	Blandford	Town Of Blandford Hwy Dept	2 Walls	Interstitial Monitoring	1,000	Diesel
				2 Walls	Interstitial Monitoring	1,000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site:

<http://www.state.ma.us/dfs/ust/ustHome.htm>

Additional information provided by individual owners

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000877	MTA Maintenance Depot	Blandford	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for

**Stockbridge Water Department**

**What is SWAP?**

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

**Susceptibility and Water Quality**

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Stockbridge Water Department
<i>PWS Address</i>	6 Main Street
<i>City/Town</i>	Stockbridge
<i>PWS ID Number</i>	1283003
<i>Local Contact</i>	Mr. Michael Buffoni
<i>Phone Number</i>	413-298-4067

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

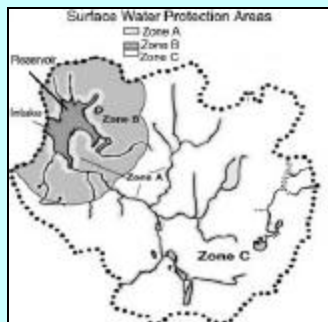
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes the following sections:**

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



## Glossary Protection Zones

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

## Section 1: Description of the Water System

*System Susceptibility:*

*Moderate*

*Source Name*

*Source ID*

*Susceptibility*

Lake Averic

1283003-01S

Moderate

Stockbridge is a small rural and residential community located in southwestern Massachusetts in the Berkshire Hills. Stockbridge is located within the Taconic-Hoosic 'bowl' surrounded by West Stockbridge Mountain to the west, Rattlesnake Hill to the east and Bear Mountain and Monument Mountain to the south. The Housatonic River flows west through the southern section of the town before it turns to flow south again through Great Barrington. The town center is located along the Housatonic River valley.

Stockbridge Water Department supplies water to the town center from Lake Averic Reservoir located in the west central section of town. The watershed for the reservoir is located on West Stockbridge Mountain. The topography of the watershed is steep sloped valley with one small feeder brook. The overburden material within the watershed is predominantly a thin cover of glacial till, often referred to as hard pan, with significant areas of exposed bedrock. The brook valley has limited deposits of recent alluvium and swamp deposits. The bedrock in the watershed is mapped as several formations consisting of metamorphic rocks and igneous intrusive rocks of the Walloomsac and Stockbridge Formations, predominantly schist and marble, respectively part of the Berkshire massif. The structural geology of the region is highly complex with several stages of folding, faulting and significant structural movement. The watershed is located within an area of faulted, overturned synclines and anticlines.

Approximately 99% of the watershed is protected from development through Town or State ownership or land held in conservation restrictions. Land use within the Lake Averic watershed is primarily forested upland (86%) with the remaining watershed consisting of water, wetland and residential activities. Please refer to the attached map to view the boundaries of the protective areas.

Water from the reservoir is treated through a Trident, rapid sand filtration system, then chlorinated for disinfection and pH adjusted with sodium hydroxide for corrosion control. For current information on water quality monitoring results and treatment processes, please refer questions for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

There are few activities that pose significant anthropogenic threats to the reservoirs. However, due to the nature of surface water supplies, these sources are considered highly vulnerable to potential contamination threats. Land uses and activities that are considered potential sources of contamination are listed in Table 2.

### Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Residential land use
3. Transportation corridors
4. Forestry
5. Protection planning

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone A** - The Zone A for a reservoir includes all areas within 400 feet of the reservoir shoreline and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Zone A is the area closest to the reservoir and its tributaries. Therefore, land uses within the Zone A are of particular concern. Activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. Beavers periodically populate the watershed.

Overall, the watershed is sparsely populated; approximately 90% of the watershed is forested. Averic Road crosses through the Zone A of the reservoir. The area is patrolled by police and the land and reservoir are posted for no trespassing. The lower reservoir, south of Lake Averic is no longer used, eliminating some residential and agricultural land uses within the Zone A. Although Averic Road is the only non-conforming land use within the Zone A, due to its proximity to the reservoir, use should be strictly monitored and the road closed to traffic if access cannot be controlled.

### Zone A Recommendations:

- ✓ Direct all stormwater to the south, outside of the watershed. Inspect the roadway for susceptibility to erosion. Determine what, if any BMPs are needed and implement improvements as required.
- ✓ Prohibit all new non-water supply activities from the Zone A on land within your control.
- ✓ Maintain patrols and enforce the no trespassing requirement. Consider requesting that the road be closed to public access and gated if access cannot be controlled.
- ✓ The Department has a policy for responding to beavers that may threaten water quality in a watershed. Please refer to the website for guidance at <http://www.state.ma.us/dep/brp/dws/protect.htm>.

**2. Residential Land Uses** – There are only a few residences located within the watershed in a small development on the east side of the watershed. None of the

### Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

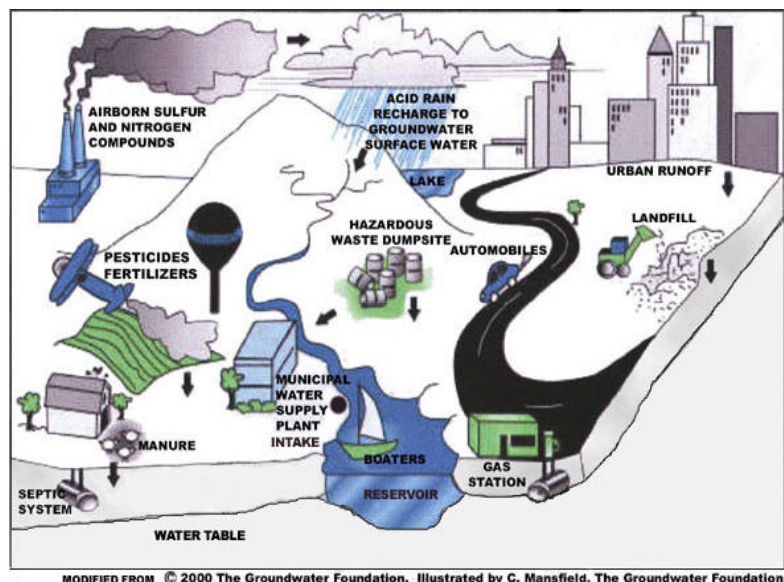


Figure 1: Sample watershed with examples of potential sources of contamination

areas have public sewers to remove wastewater, therefore on-site septic systems are used. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Establish efforts for negotiating fee simple purchase, Right of First refusal agreement, conservation restrictions and Memorandum of Understanding for land not currently owned or controlled by the District.
- ✓ Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.
- ✓ Educate residents regarding the no trespassing policy of the Water Department.

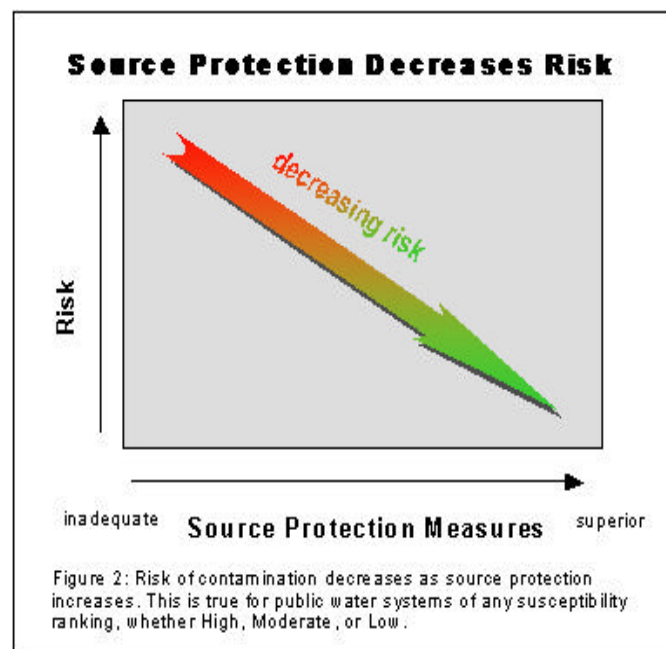
**3. Transportation Corridors** - There are very few roads within the watershed. Averic Road passes over the lower section of the watershed and there is one development on the eastern edge of the watershed with very few trails into the watershed. Even typical roadway maintenance and low use pose a potentially significant source of contamination from accidents and washouts and pesticide application for vegetation control along both the paved and dirt roads, especially in the Zone A. Erosion poses a potentially significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, by contributing sediment, various contaminants and pathogens which may result in additional water treatment costs if they continue unchecked.

The Water Department does not allow public access to watershed land that it owns, however, Averic Road is a public way. The road has been closed to truck traffic and is patrolled at least twice per day. There is



#### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watersheds**

Activities	Quantity	Threat*	Source ID	Potential Source of Contamination
<b>Agricultural</b>				
Forestry Operations	Few	M	01S	Leaks and spills, improper handling of petroleum products in equipment. Erosion.
<b>Residential</b>				
Fuel oil storage (at residences)	Few	M	01S	Fuel oil household hazardous materials: spills, leaks, or improper handling
Lawn care / Gardening	Few	M	01S	Pesticides: over-application or improper storage and disposal
Septic systems	Few	M	01S	Microbial contaminants and improper disposal of hazardous chemical
Transportation corridors	Few	M	01S	Potential threats: petroleum products and transported hazardous materials—accidental leaks or spills; pesticides—over-application or improper handling; erosion.

#### Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

little evidence of illegal access to the watershed on trails by ATVs. The Water Department has an approved Surface Water Protection Plan that addresses patrolling of the watershed. Recently, the Water Department has implemented forestry in the watershed and the Department recommends that the Water Department prepare a forest management plan that incorporates BMPs in forestry operations to protect water quality.

#### Transportation Corridor Recommendations:

- ✓ Continue regular inspections of the watershed for signs of access, illegal dumping and spills and continue to enforce the no trespassing policy.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively



contained.

- ✓ Inspect Averic Road to determine if improvements to the road are required to prevent stormwater runoff and erosion to the reservoir. If it is determined that road improvements are necessary, develop a plan and implement improvements. USDA funding may be available for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.rurdev.usda.gov](http://www.rurdev.usda.gov) or call the Rural Development Manager at the local office in Hadley at 413-585-1000. Alternatively, review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> or call the NRCS office in Pittsfield 413-443-6867 ext. 3 for assistance.
- ✓ Visit the DEP Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm> for more information on other grants and loans.

**4. Forestry and Protection Planning** – The Water Department has an approved Water Supply Protection Plan. However, plans periodically require updating to correct errors in the original plan, to reflect completed tasks and new conditions. The watershed is primarily woodland and the Water Department owns nearly 100% of the watershed. Good forest management of watershed land can beneficially impact water quality and health of the watershed forests. The Water Department recently has implemented a forest cutting policy in the watershed and is working with a contract forester. According to the Water Department, a forest management plan will be developed.

**Forestry Protection Planning Recommendations:**

- ✓ Establish active watershed protection planning and forest management for water supply protection in a comprehensive watershed plan. Update the current plan to include the comprehensive forest management plan specifically designed for a water supply watershed. Implement the plan including BMPs for wetlands and stream crossings and in compliance with forestry regulations as appropriate.
- ✓ Encourage and support efforts by private land owners in active forest management for water supply protection as appropriate.
- ✓ Continue to monitor all activities on privately held land within the watershed.

Land uses and activities within the watershed that are potential sources of contamination are included in Table 2. Identifying potential sources of contamination is an important initial step toward protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

**Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's watershed contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Preparing and implementing a Water Supply Protection Plan (WSPP),
- Detailed knowledge of the watershed and active involvement in inspecting and inventorying land uses in the watershed, and
- Working with the community to prohibit truck traffic from Averic Road.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue inspection of the Zone A protection area and watershed regularly, and when feasible, remove or manage any non-water supply activities.
- ✓ Continue cooperation and communication with emergency response teams to ensure that they are aware of the boundaries of the watershed for notification of spills or accidents.
- ✓ Through the implementation of the WSPP, provide information to landowners in your protection areas to make them aware of your water supply and to encourage the use of best management practices for residential and recreational uses and other ways they can help you to protect drinking water sources.
- ✓ Update the Watershed Protection Plan and include a review of Averic Road and a comprehensive forest management plan.
- ✓ As part of the stormwater evaluation and mitigation plans, identify problem areas specifically in the Zone A along

roads throughout the watershed. Make every effort to ensure stormwater discharge and runoff is detained prior to release to protection areas. Consider various strategies to detain/slow the flow and retain sediments to keep the runoff out of the reservoirs. Direct runoff out of the watershed if feasible.

- ✓ Once the forest management plan has been approved, implement the plan to establish/maintain a healthy and ideal watershed forest, which will buffer anthropomorphic and natural environmental impacts on water quality and quantity.

#### Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues, above and in Appendix A.

#### ➤ Provide Outreach to the Community:

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the source protection areas are located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

#### ➤ Other Funding Sources:

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS for assistance.

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection. The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help establish local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to establish priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

#### Section 4: Appendices

- A. General Protection Recommendations

#### Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

#### For More Information

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	<b>NO</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue to monitor activities on Averic Road and control access.
Is the Zone A posted with "Public Drinking Water Supply" or "No Trespassing" signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	<b>YES</b>	Continue regular inspections of drinking water protection areas. Increase patrols as appropriate and develop a plan to control access in critical areas.
Are water supply-related activities the only activities within the Zone A?	<b>YES</b>	Continue monitoring non-water supply activities in Zone A.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, Ordinances and General Bylaws)		
Do the watershed municipalities have Surface Water Protection Controls that meet 310 CMR 22.20C?	<b>NO</b>	The Water Department owns nearly the entire watershed. The small portions of the watershed that are privately held are at this time fully developed.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>N/A</b>	
<b>Planning</b>		
Does the PWS have a local surface water supply protection plan?	<b>YES</b>	Update the Plan as appropriate to address newly identified threats, inventories that may not been included and to adjust protection priorities as tasks are completed such as the stormwater management plan and the forest management plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Update the plan as appropriate by reviewing joint emergency response plans with the Fire Department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. Complete vulnerability assessment as appropriate for the system.
Does the municipality have a watershed protection committee?	<b>NO</b>	Consider establishing a committee that includes representatives from municipal and citizens' groups.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide watershed protection education?	<b>YES</b>	Continue efforts to provide information about BMPs to residents.



**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**For**  
**Berkshire Country Day School, Inc.**

**What is SWAP?**

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

**SWAP and  
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 6, 2004

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	Berkshire Country Day School, Inc.
<i><b>PWS Address</b></i>	State Route 183
<i><b>City/Town</b></i>	Stockbridge, Massachusetts
<i><b>PWS ID Number</b></i>	1283013
<i><b>Local Contact</b></i>	Mr. William Enser
<i><b>Phone Number</b></i>	413-243-1416

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well No. 1	1053007-01G	155	452	High

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes:**

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

**1. Description of the Water System**

Berkshire Country Day School, Inc. is located in the small, rural town of Stockbridge, in southwestern Massachusetts on State Route 183. The school is located immediately south of the Lenox town line. The school has a student and staff population of approximately 340 people. Although there is a municipal water system and wastewater treatment plants in both Stockbridge and in Lenox, they do not serve this section of town. Therefore, the school water is supplied through one on-site well and wastewater is discharged to an on-site septic system.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I protection area for a well is the area immediately around the well that is considered most vulnerable to contamination. The Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the facility require DEP approval and compliance with Zone I restrictions.

The school's well is located immediately adjacent to a soccer field, within 50 feet of one of the school buildings and within 20 feet of a brook. In the late 1990's the school constructed the soccer field and added and expanded buildings within the Zone I of Well #1. The DEP allowed the school to continue using the non-conforming Well #1, but required the school to decrease their water use to 1,250 gallons per day and to provide an alternate water source either by developing a conforming well through the New Source Approval Process or by connecting to an existing, adjacent municipal/public water supply. The school signed an Administrative Consent Order agreeing to these conditions. To date, the school has not reduced their water use, and has not developed a conforming well or secured an agreement to connect to a municipal/public water supply source.

The geologic mapping of the area indicates varying thickness of overburden material, primarily till, with numerous exposures of bedrock in the upland areas. Geologic mapping indicates a complex series of folds and faults within the Taconic-Berkshire Zone. The primary bedrock mapped in the vicinity of the school is the Wollumscac Formation, phyllite with limestone. Mapping indicates a dark grey calcitic schistose marble.

As noted, the DEP established the school well Zone I and IWPA protection area radii are 115 and 428 feet, respectively, based on the required maximum water use of 1,250 gallons per day. However, a review of the annual statistics reports from 1998 through 2002 showed the average daily water use for the two highest months of water use during that period was approximately 2,316 gallons per day. **Therefore, the DEP herein is reestablishing the Zone I and IWPA for Well #1 based on reported water use. The Zone I and IWPA protection area radii for that volume of water use are 155 feet and 452 feet, respectively.** The Zone I protection area of 155 feet

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to expanding the facility or conducting any work in the Zone I.
Fuel storage (AST/UST)	Yes	Yes	Moderate /High	Spills, leaks, or improper handling of fuel oil
Transportation corridors and parking	Yes	Yes	Moderate	Be sure emergency responders are aware of the location of your wells.
School	Yes	Yes	Moderate	Continue policy of not using pesticides and fertilizers. Manage septic system and facilities.
Floor drain in boiler room	No	Yes	Moderate	Contact UIC coordinator in the region to discuss compliance.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

includes many activities that pose a potential risk of contamination to the well such as the school's buildings and fuel storage tanks. The remainder of the school facilities including the 10,000-gallon underground fuel oil storage tank, parking, the school and headmaster's house leachfields are located within the IWPA of the well.

The water supplied to the school is not treatment at this time. The DEP requires public water suppliers to routinely monitor the quality of the water. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), EPA's Envirofacts website.

## 2. Discussion of Land Uses in the Protection Areas

There are numerous land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **School facilities and athletic field;**
3. **Fuel storage tanks (UST/AST);**
4. **Floor drain in boiler room; and**
5. **Transportation and parking.**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which require the system to own or control the entire Zone I area and allow only water supply related or other non-threatening activities in Zone I.

### Recommendations:

- ✓ Comply with the current requirements to provide an alternate source of water.
- ✓ Do not allow any new non-water supply activities in the Zone I.

- ✓ Monitor and control all activities near the well.
- ✓ Monitor all fuel deliveries.

**2. School facilities and athletic fields** – Elementary schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the well, including fuel oil tanks, parking, septic components and leachfields. Stormwater may also pose a risk. Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

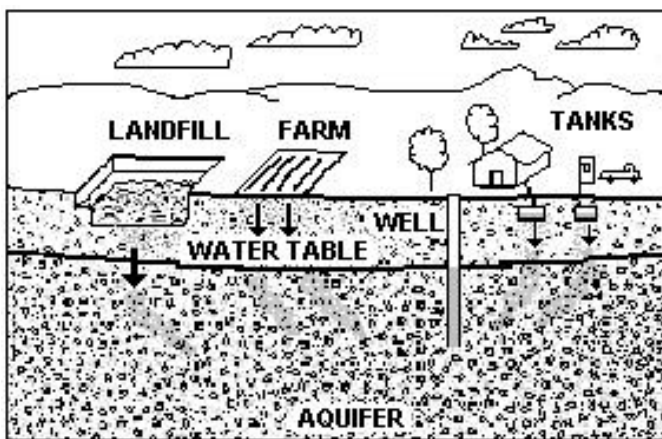


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use fertilizers and pesticides in the Zone Is.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- ✓ Refer to the Massachusetts Public Health Association's Healthy Schools website for additional information, online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**3. Fuel Storage Tanks– Underground/Aboveground Storage Tank (UST/AST) –** If managed improperly, underground fuel oil storage tanks and the associated fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store. The fuel oil lines from the UST to the buildings it serves are sleeved to protect against leaks in the lines. In addition, there is an AST fuel oil tank in the basement of the Administration Building boiler room along with a sump pump that reportedly discharges to the septic system. The school also has propane USTs that do not pose as significant a threat as the fuel oil UST.

### Recommendations:

- ✓ Any modifications to the UST/AST must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ Monitor deliveries of oil as many spills are related to delivery.
- ✓ Containment of the fuel system to prevent accidental releases to the floor is important. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require that your boiler maintenance contractor use containment, protect the well and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**4. Floor Drain in Boiler Room –** There is a floor drain in the boiler room in the Administration building that reportedly discharges to the septic system; there is also an AST fuel oil storage tank in the basement. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

### Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - ◆ Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
- ✓ Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the

UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- ✓ Determining the discharge location of the drains. Seal all cracks in the floor and the floor drain if it is not needed to protect the building from flooding and if it cannot be adequately protected to prevent a prohibited discharge.

**5. Transportation corridor and parking** – Internal roadways and facility parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

**Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- ✓ Continue to manage on-site stormwater to ensure it flows away from the well.

In addition, at the time of the assessment, the DEP noted three pole-mounted transformers within the Zone I that appeared to be relatively old and did not carry a label identifying them as being free of PCBs. If those transformers have not yet been replaced, contact the local utility company and request that they confirm the transformers are in compliance with current requirements or have them replaced.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The school is commended for utilizing propane for one building's fuel source, however there are significant threats that need to be addressed at the school. The water supplier should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- ✓ Provide an alternate water source for the facility as required.
- ✓ Monitor fuel oil delivery and activities within close proximity to the wells. Do not use or store hazardous materials in the vicinity of the wells.

**Zone I:**

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Post the area with "Public Drinking Water Supply Recharge Area" signs at appropriate locations away from the actual wells.
- ✓ Monitor all existing activities within the Zone I.
- ✓ Inspect the well and the cap regularly. Ensure the cap is watertight and secure and that there is no standing water at the well.

**Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into the school curriculum and community.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

**Facilities Management:**

- ✓ If it is feasible in the future, consider upgrading all of heating systems to propane for the purpose of removing fuel oil storage from the school.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Keep the area near transformers free of tree limbs that could endanger the transformer in a storm.
- ✓ Contact the UIC coordinator to address any floor drains in areas where hazardous materials could discharge to the ground or to a septic system.

**Planning:**

- ✓ Work with local officials in town to develop an Aquifer Protection District with bylaws and include the facility's IWPA in the District, along with other public water supply wells in town and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



**Massachusetts Department of Environmental Protection**  
**Source Water Assessment and Protection (SWAP) Report**  
**For**  
**Kripalu Center for Yoga & Health**

**What is SWAP?**

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

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Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 21, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	Kripalu Center for Yoga & Health
<b>PWS Address</b>	West Street
<b>City/Town</b>	Stockbridge, Massachusetts
<b>PWS ID Number</b>	1283014
<b>Local Contact</b>	Mr. John Schneyer
<b>Phone Number</b>	(413) 232-7741

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>IWPA (in feet)</b>	<b>Source Susceptibility</b>
Well #1	1283014-01G	283	769	High
Well #2	1283014-02G	283	769	High
Well #3	1283014-03G	100	422	Moderate
Well #4	1283014-04G	100	422	Moderate

**Introduction**

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

**Purpose of this report:**

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

**This report includes:**

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

**1. Description of the Water System**

Kripalu is a yoga and holistic health center located in Stockbridge, on the Lenox town line, overlooking Stockbridge Bowl in south Berkshire County. Kripalu has a residential community and accommodates day and overnight visitors and students year round; the facility can accommodate up to 450 people. The facility previously

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

functioned as a Jesuit Monastery, Shadowbrook. Kripalu owns and maintains its own water supply system and wastewater disposal facility; to supplement their water supply, Kripalu purchases water from the Lenox Water Department. At one time, Kripalu had six wells. Wells #1 and #2 are currently the only active potable water supply wells. Wells #3 and #4 have been inactive since 1992 and Well #5 was abandoned and physically decommissioned to accommodate expansion and repair of a parking area. Well #6 was installed in 1988 but was never activated due to low productivity. The facility's wastewater is discharged to a wastewater treatment facility southwest of the main campus.

Well #1 is a 6-inch diameter, 162 feet deep bedrock well that is located immediately adjacent to the parking area behind the main building. Well #2 is a 6-inch diameter, 242-foot deep bedrock well that is located west of the maintenance building formerly the printing shop. In mid-November 2003, Kripalu was in the process of deepening Wells #1 and #2 due to a loss of capacity in those wells. At the time this report was prepared, the DEP did not have final completion depths of those wells. Wells #3 and #4 are located within 100 feet of each other, adjacent to the old greenhouses along Richmond Road. Well #3 is a 6-inch diameter, 382 feet deep bedrock well and Well #4 is a 6-inch diameter, 402 feet deep bedrock well.

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's wells are as follows: Well #1 – Zone I is 283 feet and IWPA is 769 feet; Well #2 – Zone I is 283 feet and IWPA is 769 feet; Well #3 – Zone I is 100 feet and IWPA is 422 feet Well #4 – Zone I is 100 feet and IWPA is 422 feet respectively. These protection area radii are based on the historic water withdrawal rates from these wells.

The Zone I area for Well #1 includes approximately half of the main facility, including parking, transformers and compactor/composter. The Zone I for Well #2 includes roadways, the maintenance/printing shop, vehicle storage and deicing materials (covered). The Zone Is for Wells #3 and #4 include a former very small, non-commercial greenhouse and a residence. The IWPAs for Well #1 and #2 include the rest of the main campus facilities except the wastewater treatment plant, which is topographically downgradient from the wells and outside of the protection areas.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Maintenance garage/print shop	Well #2	Well #2	High	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Underground and Above Ground Storage Tanks	No	Well #1	High	Proper maintenance and upgrades to fuel tanks to prevent releases from occurring
Institution Uses	Well #1	Well #2	Moderate	Encourage residents and staff in proper storage, disposal, and application of pesticides
Transportation Corridors/Parking	Well #1	All	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The geologic mapping of the area indicates varying thickness of overburden material, primarily till with numerous exposures of bedrock in the upland areas. Data from the water supplier indicate casing lengths of over 100 feet in Wells #1 and #2, while Well #3 and #4 have approximately 25 feet of casing. Geologic mapping indicates a complex series of folds and faults. The primary bedrock is the Wollumsac Formation, a phyllite with limestone, with nearby contacts with the Everett Formation, chloritoid-rich schist and carbonates of the Stockbridge Formation.

Although wells #3 and #4 are free flowing artesian wells, there is no evidence of a continuous hydrogeologic barrier (clay layer) in the vicinity of the wells. Therefore, the aquifer is considered to have a high vulnerability to contamination. Nonetheless, the hydrogeologic barrier that does exist provides some protection relative to impeding the downward migration of contaminants from areas overlying the barrier. Please refer to the attached map of the Zone I and IWPA.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses;**
3. **Institutional Uses;**
4. **Underground and Above Ground Storage Tanks and,**
5. **Transportation Corridor**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use or activity in the protection areas of at least one of the wells, as seen in Table 2.

**1. Non-conforming Zone I** – Currently, none of the wells meet DEP's Zone I restrictions, which allow only water supply related activities or other non-threatening activities within the Zone I. The Zone I contains driveways, roads, parking spaces, institutional facilities, maintenance facilities and a residence. Systems not meeting DEP Zone I requirements must notify the DEP, receive approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Although it is impossible to remove all activities within the Zone Is, Kripalu should continue to work toward prohibiting/limiting/impeding parking in close proximity to the well and using BMPs to protect the water supplies.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Continue to direct driveway and parking lot drainage in

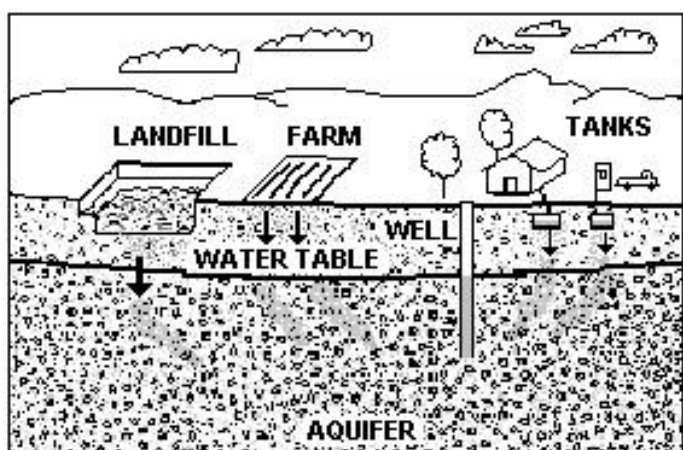


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

the Zone I away from the well.

- ✓ Continue investigating options for development of additional sources.

**2. Institutional use** – The facility is a residential and institutional facility with all associated activities including dormitories, an infirmary, recreational facilities, classrooms, dining commons, etc. In addition, there are all of the accompanying activities associated with maintenance and services provided to the facility including fuel oil storage, gasoline, transformers, maintenance facilities, roads and lawn maintenance.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Recommendations:

- ✓ Continue the use and maintenance of BMPs for activities within close proximity to the wells.
- ✓ Continue monitoring and managing stormwater runoff, directing it away from the wellhead.
- ✓ Do not use pesticides or fertilizers within the Zone I of the wells. Consider the use of Integrated Pest Management on campus to minimize the use of pesticides and nutrients in fertilizers.
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Underground Storage Tanks (UST)** – There are four USTs located on the campus within the IWPA of the Well #1. All but one of the tanks contain fuel oil; one tank (a double walled tank with interstitial monitoring) is for gasoline storage. The tanks are approximately 17 years old, are double walled and have over-fill containment.

### Recommendations:

- ✓ USTs in close proximity to the water supply should be closely monitored, especially during deliveries. Review stormwater flow direction and anticipate control of a potential spill during delivery. Replace and upgrade tanks as appropriate.
- ✓ Continue to evaluate and consider a replacement well location and use of alternative fuel, as is feasible.
- ✓ Any upgrades and modification to fuel storage facilities must meet current construction standards and be done consistent with Massachusetts’ plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ Require that fuel lines are sleeved to protect from leaks.
- ✓ Review construction details for the tanks to ensure that they include overfill protection. Retrofit those without containment, as is feasible.
- ✓ Ensure that a spill response plan is included in the school emergency response plans and ensure spill containment equipment is available. Include plans of storm drain systems in the emergency response plan.

V Monitor deliveries so that any spills can be readily contained.

**4. Transportation corridors and parking** – Even minor roads and internal facility roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

**Recommendation:**

- ✓ Contact the local fire department to ensure that the IWPA is included in Emergency Response Planning.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Kripalu is commended for past efforts to protect water supplies through management of hazardous materials and controlling stormwater runoff. The facility should continue efforts in water supply protection through reviewing and adopting the key recommendations above and the following:

**Zone I:**

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**Training and Facilities Management:**

- ✓ Continue proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ As is feasible, replace the supply wells or remove threats such as the USTs.

**Planning:**

- ✓ Work with local officials in town to include the facility's IWPA in Aquifer Protection District Bylaws if the town establishes such bylaws in the future.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the wells and is treated according to DEP guidance.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Source Water Assessment Program (SWAP) Report For White Pines Condominiums

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 3, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	White Pines Condominiums
<i>PWS Address</i>	P.O. Box 570
<i>City/Town</i>	Stockbridge, Massachusetts
<i>PWS ID Number</i>	1283015
<i>Local Contact</i>	Douglas A. Weaver
<i>Phone Number</i>	413-637-1140

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1283015-01G	288	800	High
Well #2	1283015-02G	288	800	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The White Pines Condominiums, located in Stockbridge, has its water supply for 70 connections: 68 condominiums, office building, and pool building. The condominium community is served by on-site septic disposal systems. The two wells that serve the facility are nearly identical, 6-inch in diameter and 310 feet deep. Both wells are lined to a 210-foot depth with 4-inch casing to prevent surface water infiltration through the well casing annulus to minimize historical bacterial contamination. The Zone I and Interim Wellhead Protection Area (IWPA) radii for both wells are 288 feet and 800 feet, respectively.

The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The protective areas have been calculated based on the

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

highest volume pumped as reported to the Department in the 1996 Annual Statistics Report. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. USGS mapping shows the bedrock of the area as carbonate rock, mainly biotite-rich quartzose schist. The water from the two wells is treated by reverse osmosis (with pre-filtration) for hardness removal. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Nonconforming activities in the Zone I;**
2. **Underground Storage Tank;**
3. **Septic System;**
4. **Internal Transportation Corridors; and**
5. **Storm Water Catch Basins.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of two high threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

**1. Nonconforming activities in the Zone I** – Currently, the water supplier does not own or control the entire Zone I area. Please note that systems not meeting DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. There are non-water supply activities occurring within the Zone I, such as structures (indoor pool), parking, and fertilizer use (Scott's Turf Builder).

### Recommendations:

- ✓ Control access to the wellhead area and make every effort to acquire Zone I control or ownership.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Road Salt and Sand Storage	Well #2	All Wells	Moderate	Use containment
Low Density Housing	All Wells	All Wells	Moderate	Use BMPs, encourage participation in household hazardous waste collection days
Internal Transportation Corridors and Parking	All Wells	All Wells	Moderate	Limit road salt usage and provide drainage away from wells
Hazardous Materials Storage	All Wells	No	High	Use containment or store outside of Zone I
Septic System	No	All Wells	Moderate	See attached brochure
Underground Storage Tank	Well #2	No	High	300-gallon tank, monitor for leaks, overfills.

\* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 feet to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

**2. Underground Storage Tank (UST)** – There is a UST located on the southeast side of the office building, with a maximum content of 300 gallons of #2 fuel oil, within Zone I. If managed improperly, USTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

### Recommendation:

- ✓ USTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**3. Septic Systems** – The facility's septic system is located within the IWPA. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

### Recommendations:

- ✓ Provide residents and staff with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

**4. Internal Transportation Corridors** -- The Zone I and IWPA contain roads and parking areas developed and maintained by the White Pines Condominiums. Transportation corridors can be a potential source of contamination from road salt and automotive leaks or spills.

### Recommendations:

- ✓ Monitor parking areas and roads for accidental leaks and spills.
- ✓ Do not use salt or deicers within the Zone I.
- ✓ Restrict access where possible.

**5. Storm Water Catch Basins** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of

contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

### Recommendation:

- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Other potential threats noted during the site visit include sand and salt storage in the IWPA, low-density housing, and potentially hazardous materials stored in the Zone I. The salt and sand mixture is covered with a tarp and enclosed within a wooden fence. The condominiums are all located within the IWPA, some within the Zone I. Encourage residents to utilize local household hazardous waste collection days, and supply information about BMPs for household hazardous waste management. Chlorine for the pool is stored in the west side of the pool building. Secondary containment is recommended for this storage if removing it from the Zone I is not feasible.

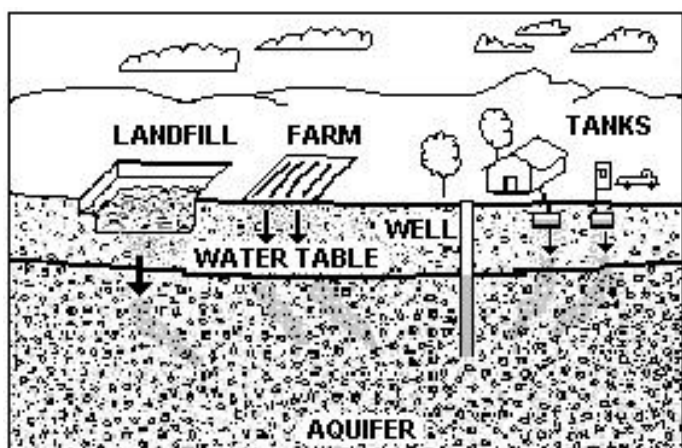


Figure 1: Example of how a well could become contaminated by different land uses and activities.



#### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. White Pines Condominiums is commended for using natural gas as the heating source. White Pines Condominiums should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Remove all reasonable non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities and posting signs.

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Use BMPs within the Zone I and restrict activities that could pose a threat to the water supply.
- ✓ Do not use pesticides and fertilizers in Zone I.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for power sources in areas utilizing fuel oil.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

#### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides

and pesticides on facility property.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and regulatory requirements.



**Planning:**

- ✓ Work with local officials in Stockbridge to include White Pines Condominiums' IWPA in Aquifer Protection District Bylaws, and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Shaggy Dog Studios

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 11, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Shaggy Dog Studios
<i>PWS Address</i>	Wallace Road
<i>City/Town</i>	Stockbridge, Massachusetts
<i>PWS ID Number</i>	1283017
<i>Local Contact</i>	Mr. William Enser
<i>Phone Number</i>	413-243-1416

<i>Source Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1283017-01G	114	428	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Shaggy Dog Studios complex is located off of Route 7 in the town of Stockbridge in south Berkshire County. The facility served by the public water system consists of two buildings: a 10 unit, 18-bedroom apartment building and the barn, a former music studio that is now vacant. Stockbridge does have a municipal water and wastewater treatment system but they do not serve this section of town. There is no municipal sewer available and therefore all of the facilities are served by on-site wastewater disposal.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Water is supplied by a single source, Well #1 that is located between the barn and the pond, approximately 60 feet south of the barn. Well #1 is a 720 feet deep, 6-inch diameter well drilled into the bedrock aquifer. There are two other wells on site that are both severed from the system. Well #2 is located east of the facility across the access road; Well #3 is located immediately west of the apartments and was abandoned as a source to accommodate an expansion of the facility. Only Well #1 is addressed in this report; both of the other wells should be secured at all times to ensure no down-hole contamination is possible. The facility is served by an on-site wastewater disposal system located northeast of the facility.

The Zone I is the area immediately around the wellhead, while the Interim Wellhead Protection Area (IWPA) is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be smaller or much larger than the IWPA. The Zone I and IWPA radii for Well #1 are 114 feet and 428 feet, respectively. The protective radii were based on maximum water use at the facility. Please refer to the attached map that shows the Zone I and IWPA radii.

The complex is located in an area where the geologic mapping indicates thin till overburden covering the bedrock. The bedrock at the site is mapped as carbonate rocks, primarily quartzite and dolomitic marble of the Stockbridge Formation. There is no evidence of a protective till or clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The facility's well water is treated through an ion exchange unit to remove iron and hardness utilizing potassium chloride. Public water suppliers are required to monitor water quality at the facility. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP before expanding or modifying the facility.
Transportation corridors/parking	Yes	Yes	Moderate	Manage stormwater and limit road salt usage.
Above ground storage tank (fuel oil)	No	Yes	Moderate/High	Fuel lines are sleeved but the basement floor is dirt under the tanks and there is a sump and pump in the basement.
High density/low density residential	No	Yes	Moderate	Provide BMPs for household hazardous waste management. Use IPM for lawn maintenance.
Septic system components	Yes	Yes	Moderate	Leachfield is located outside of the protection areas. Some components are within the Zone I and IWPA.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

1. **Non-conforming Zone I;**
2. **Transportation corridors/parking; and,**
3. **Residential development.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land use or activity in the Zone I and/or IWPA, as seen in Table 2.

**1. Non-conforming Zone I** – Zone I restrictions allow only water supply related activities or other non-threatening activities in Zone I. Currently, the system does not meet DEP's Zone I requirements as the Zone I includes road, parking, housing, fuel oil tanks and septic system components. Although the fuel lines from the oil tanks are sleeved, part of the basement is dirt and a potential conduit for oil to seep into the ground in the event of a spill.

## Recommendations:

- ✓ Do not allow any additional non-water supply activities in the Zone I.
- ✓ Inspect the casing regularly to ensure the integrity of the cap and seal and to ensure there is no standing water near the casing.
- ✓ Continue to prohibit storage and use of hazardous materials in Zone I.
- ✓ Control activities in Zone I as is reasonable.
- ✓ Provide containment for the oil tanks in the basement to prevent a release from an overflow or leak.

**2. Transportation corridor/parking** – Wallace Road and the facility roadways and parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

## Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- ✓ Continue to manage on-site stormwater to ensure it flows away from the well.

**3. Residential Land Uses** – The apartment complex consists of 18 units and there are a few private homes within the protection areas. The facility utilizes a single on-site septic disposal system; the leachfield is outside of the IWPA although some components are within the Zone I. The private homes use private septic systems located within the IWPA. The complex utilizes oil for heat and although the tanks are new and the lines are sleeved, the two storage tanks are located in a partially dirt floored basement. If a release occurred in the basement, the dirt floor would act as a direct conduit to the ground. It is unknown what fuel sources the surrounding residences utilize. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

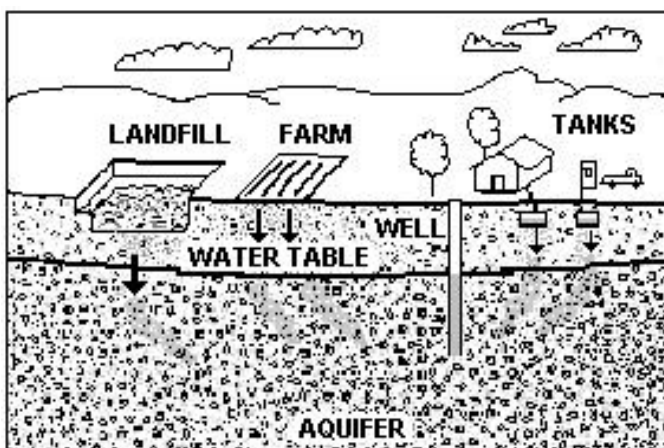


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their piping can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” attached to this report and at the DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Provide containment for the tanks and the furnace to prevent potential for a leak. A dirt floor and the sump and pump in the basement may be pathways for an accidental release of oil to migrate into the environment. Consider alternatives for containment of the tanks.
- ✓ Contact the Underground Injection Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - ◆ Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Containment of the fuel system to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. Oil lines from the tank to the boiler are presently sleeved so that any leaks would drain back to the tank or minimal oil would leak to the room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Review and adopt the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Direct stormwater away from well.
- ✓ Conduct regular inspections of the Zone I.

- ✓ Do not use or store pesticides, fertilizers, petroleum products or road salt within the Zone I.
- ✓ Consider providing containment for the oil tanks.
- ✓ Ensure that Well #2 is secured or decommission the well in accordance with the DEP guidance.

#### **Facilities Management:**

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Continue to educate the residents and control the use of household hazardous materials in the Zone I.

#### **Planning:**

- ✓ Request that the Planning Board include your IWPA in the Aquifer Protection District along with IWPA's for other public water supplies in town.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Continue long term planning for the system that includes maintenance of the water and wastewater systems.

#### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Sunderland Water District**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Sunderland Water District
<i>PWS Address</i>	12 School Street
<i>City/Town</i>	Sunderland, Massachusetts
<i>PWS ID Number</i>	1289000
<i>Local Contact</i>	Stanley Wasilauski
<i>Phone Number</i>	(413) 548-9362

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

*System Susceptibility;* High

*Zone II #: 446* *Susceptibility:* Moderate

Well Names	Source IDs
Ralicki Well	1289000-01G

*Zone II #: 445* *Susceptibility:* High

Well Names	Source IDs
Hubbard Well	1289000-02G

Sunderland is a small, but growing, agricultural, rural/residential community in the central Connecticut River Valley in western Massachusetts. The Sunderland Water District maintains and operates two gravel packed wells and a reservoir. The reservoir is maintained as an emergency source only and will not be further addressed in this report. The wells for Sunderland Water District are located in two different aquifers and have two distinct Zone II recharge areas. Both wells are located east of Route 116 with the Ralicki Well located approximately in the center of town while the Hubbard Well is located in the south of town near the borders of Leverett and Amherst. The Zone II for the Hubbard Well extends in to Leverett while the Zone II for the Ralicki well lies entirely within Sunderland. The wells are located within stratified drift, sand and gravel deposited during the retreat (melting) of the glaciers some 10,000 years ago. The Ralicki well is located at the edge of the buried valley near Dry Brook at the base of a bedrock hill. The Zone II recharge area for the well is fairly limited in extend. The Hubbard well is located at the base of a large glacial delta, a sand and gravel deposit created by meltwater flowing into a lake that formed along what is now the Connecticut River valley. Glacial Lake Hitchcock was formed during the glacial retreat and fine grained lake bottom clays were deposited further into the lake. Fast moving water, deposited sand and gravel in the delta and along the lake edge. There is no evidence of a confining clay unit above the productive sand and gravel in either the Ralicki or the Hubbard well. The bedrock in the area is mapped as the sedimentary rocks of the turners falls and Sugarloaf formations and the metamorphic Joshua Schist to the west of long Plain Brook in Leverett.

Each well has a Zone I protective radius of 400 feet. The aquifers utilized by the wells are considered to have high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

The Zone IIs for Sunderland Water District are a mixture of forest, cropland,

sand and gravel mining, and residential land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

**Key Land Uses and Protection Issues include:**

1. Nonconforming Zone I
2. Residential land uses
3. Transportation corridors
4. Sand and Gravel Mining
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The two (2) Zone Is for the wells are not entirely owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I for Ralicki Well (01G) - contains parts of two residential lots.

Zone I for Hubbard Well (02G) - contains small portions of few local roads.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and household chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

**2. Residential Land Uses** – Approximately 9% of the Zone II for the Ralicki well (01G) and 28% of the Zone II for the Hubbard well (02G) consist of residential land use areas. The residential areas near the Ralicki well (01G) have public sewers available however, the residential areas near the Hubbard well (02G) all utilize septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

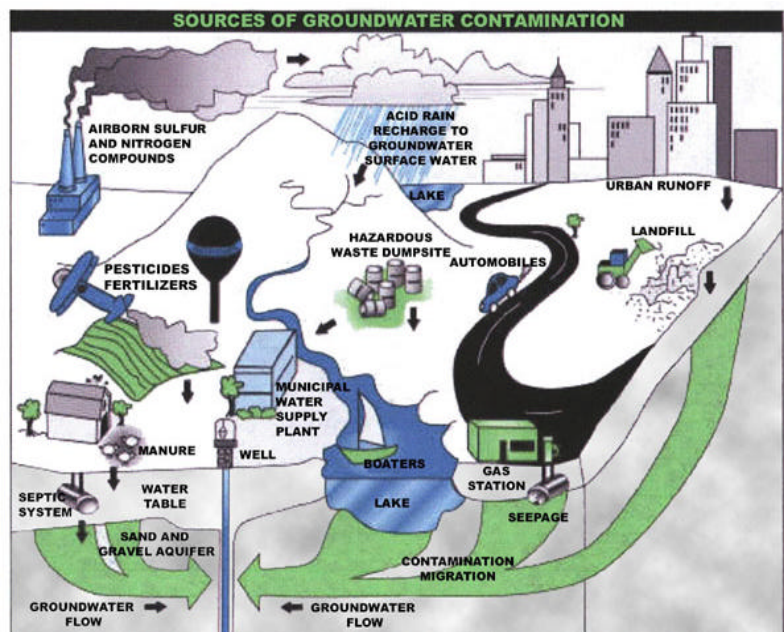
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of

**Benefits  
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can also be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

**3. Transportation Corridors** - Routes 116 and Route 63 run through the Zone II for the Hubbard Well (02G). Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Railroad tracks run through the Zone II for the Hubbard Well (02G). Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If

(Continued on page 6)

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### **For More Information**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

#### **Source Protection Decreases Risk**

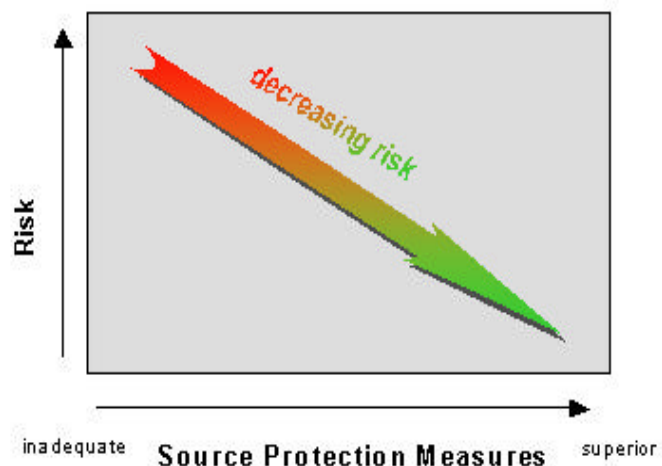


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas (Zones I and II)**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Zone II	Threat*	Potential Source of Contamination
<b>Agriculture</b>				
Fertilizer Storage or Use	Several	#445	M	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	3	#445	M	Manure (microbial contaminants): improper handling
Landscaping	Several	#445	M	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Manure Storage or Spreading	3	#445	H	Manure (microbial contaminants): improper handling
Nurseries	1	#445	M	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	Several	#445	H	Pesticides: leaks, spills, improper handling, or over-application
<b>Commercial</b>				
Cemeteries	1	#445	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Railroad Tracks	1	#445	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	2	#445	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
<b>Industrial</b>				
Asphalt, Coal Tar, And Concrete Plants	1	#445	M	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Hazardous Materials Storage	1	#445	H	Hazardous materials: spills, leaks, or improper handling or storage
Hazardous Waste Storage, Treatment and Recycling	1	#445	H	Hazardous materials: spills, leaks, or improper handling or storage



Activities	Quantity	Zone II	Threat*	Potential Source of Contamination
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous	Both	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	Both	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	Both	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>				
Clandestine Dumping	1	#445	H	Debris containing hazardous materials or wastes
Stormwater Drains/ Retention Basins	Several	#445	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	2	#445	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Several	Both	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
<b>Notes:</b> <ol style="list-style-type: none"> <li>When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.</li> <li>For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.</li> <li>For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.</li> </ol> <p>* <b>THREAT RANKING</b> - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

**4. Sand and Gravel Mining** – Eight percent (8%) of the land area within the Zone II for the Hubbard Well (02G) is sand and gravel mining. Sand and gravel mining, like many small businesses and industries uses hazardous materials, produces hazardous waste products, and/or store large quantities of hazardous materials in UST/AST or on-site equipment. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Continue working with local businesses that use hazardous materials/generate hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water



- ✓ protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ Review local by-laws controlling sand and gravel mining operations. The Department advocates prohibiting excavation within 10 feet of the historic high water table.

**5. Agricultural Activities** – There are several farms throughout the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

**Agricultural Activities Recommendation:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Be sure that all facilities that may be regulated under the DFA pesticide regulations are aware they are in the Zone II.

**7. Protection Planning** – Currently, the Town does not have water supply protection controls that meet the Department’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells. Leverett does have water supply protection bylaws in place to control activities with the Zone II.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls in Sunderland and Leverett with current MA Wellhead Protection

**Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Regulations 310 CMR 22.21(2). If the local controls do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

- ✓ If local controls in Leverett and Sunderland do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ As noted previously, review local by-laws controlling sand and gravel mining operations. The Department’s regulations require local bylaws to have a minimum separation from groundwater of 4 feet in sand and gravel operations. However, the Department advocates more stringent controls and refer to the Cape Cod Commission’s recommendation of prohibiting excavation within 10 feet of the historic high water table as a more protective measure.
- ✓ For existing facilities, be sure that the enforcement authority conducts inspections as appropriate. Continue working with the businesses to support their continued use of BMPs to minimize their liability and protect the environment.

Other land uses and activities within the Zone II are listed in Table 2. Refer to

*(Continued on page 8)*

Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through local bylaws and regulations providing guidance for gravel removal.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Ensure that all farms within the Zone IIs are aware they are in the protection area to assist them in complying with pesticide regulations.
- ✓ Develop and implement a Wellhead Protection Plan.

#### ➤ **Partner with Local Businesses:**

Since many businesses and industries, including small businesses, use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### ➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection. Work with neighboring communities.

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is planning, such as the adoption of local controls to protect watersheds and ground water. These controls may include health regulations, general ordinances, and zoning by laws that prohibit potential sources of contamination from wellhead protection areas. Encourage and support the use of BMPs.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

**Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	When possible, purchase Zone I lands, pursue conservation restrictions, or otherwise work to keep non-water supply activities out of the Zone Is.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	The Town does not have controls that meets DEP’s requirements for wellhead protection. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with Leverett to include Zone IIs in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>NO</b>	Develop a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams in Sunderland and in Leverett.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>YES</b>	For more guidance see “Hazardous Materials Management: A Community's Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at residential, commercial, and municipal uses within the Zone II.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
132830	Warner Brothers	RTE 116	Sunderland	Recycler of Hazardous Waste	Large Quantity Generator of Hazardous Waste	Sand and Gravel Mining
				Plant	Restricted Air Emission Status Approved	Sand and Gravel Mining

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



# Source Water Assessment and Protection (SWAP) Report For Cliffside Apartments

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 2, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Cliffside Apartments</b>
<i>PWS Address</i>	<b>248 Amherst Road</b>
<i>City/Town</i>	<b>Sunderland, Massachusetts</b>
<i>PWS ID Number</i>	<b>1289001</b>
<i>Local Contact</i>	<b>Ms. Diane Hamill, Manager</b>
<i>Phone Number</i>	<b>413-665-3958</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone 1 (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1289001-01G	310	953	Moderate
Well #2	1289001-02G	310	953	Moderate
Well #3	1289001-03G	310	953	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Cliffside Apartments complex is located on Route 116 in the center of the rural/residential and agricultural community of Sunderland. The complex has 280 residential units within nine buildings. Municipal sewer serves the community and there is natural gas pipeline and electric heat available; there is no on-site heating oil although there is an above ground propane tank. The facility is served by three bedrock wells



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

located on the side of the hill behind the facility. Although there is no information about Well #1, data indicate Well #2 is approximately 260 feet deep while Well #3 is approximately 277 feet deep. Well #3 serves as the main well with Well #1 and Well #2 supplementing the lead well. Historical information indicates casing to depths of approximately 50 feet in both wells #2 and #3 and all three wells have 5 hp pumps installed.

The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. Actual recharge areas to the wells may be significantly larger or smaller than the IWPA. The size of the Zone I and IWPA protective radii are based on the volume of water withdrawn from the well. Since there is only a master meter recording total usage, the Zone I and IWPA radial areas are based on an estimated withdrawal of approximately 17 gpm from each well. The Zone I and Interim Wellhead Protection Area (IWPA) radii for all three wells are 310 feet and 953 feet, respectively.

The apartments are located on the edge of the Connecticut River valley floor with the majority of the facility located within the valley and the sources located on the hill behind the facility. The valley is a bedrock valley filled with sand and gravel during the glacial retreat (melting) some 10,000 years ago. The bedrock in the area is mapped as the sedimentary rocks of the Turners Falls and Sugarloaf Formations and the metamorphic Joshua Schist to the west of long Plain Brook in Leverett. There is no evidence of a protective confining unit in the vicinity of the wells. Wells located in this type of an aquifer are considered to be highly vulnerability to contamination due to the absence of hydrogeologic barriers, such as clay, that can prevent contaminant migration from the surface.

At the time this report was prepared, the water at Cliffside Apartments did not require treatment. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are several activities within the drinking water supply protection areas that are potential sources of contamination.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
High density residential housing	No	Yes	Moderate	Use BMPs, encourage participation in household hazardous waste collection days. Prohibit vehicle maintenance.
Transportation corridors and parking	No	Yes	Moderate	Limit road salt usage and provide stormwater drainage away from well.
Public access	Yes	Yes	Moderate	Secure wellheads from vandalism and access.
Maintenance garage	No	Yes	Moderate	Use BMPs, review usage to determine if hazardous waste generator registration is required.

\* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

1. **Nonconforming Zone 1**
2. **High density residential housing,**
3. **Transportation corridors/parking,**
4. **Maintenance garage.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the IWPA, as seen in Table 2.

**1. Nonconforming Zone I** – Currently, the water supplier does not own or control the entire Zone I area for the wells. Please note that systems not meeting DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. There are only passive non-water supply activities occurring within the Zone I, such as trails. However, there is evidence that hiking and trail bikes are used along the trails. There is also anecdotal information about incidents of minor vandalism to the wellheads.

## Recommendations:

- ✓ Control access to the wellheads. Consider fencing in the wellheads and prohibiting access to the wells.
- 2. Residential Land Uses** – The entire facility is located within the IWPA of the wells. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
  - **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

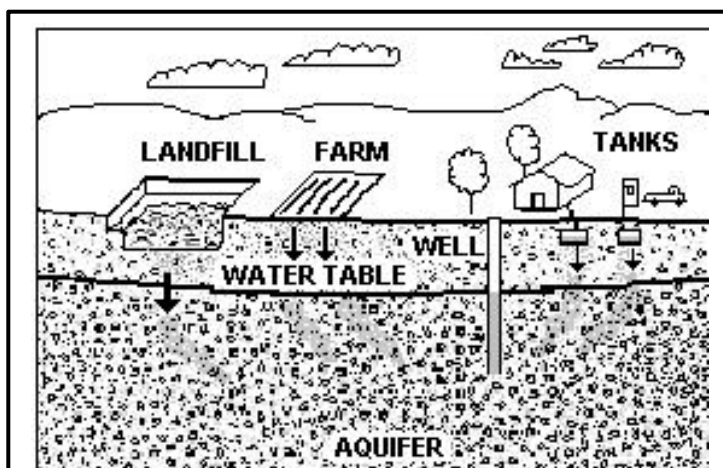


Figure 1: Example of how a well could become contaminated by different land uses and activities.

## Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

**4. Transportation corridors/parking** -- The Zone I and IWPA contain a municipal road, internal roads and parking. Transportation corridors can be a potential source of contamination from road salt and automotive leaks or spills. As storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, etc.

#### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and the town boards.

#### Recommendations:

- ✓ Monitor parking areas and roads for accidental leaks and spills.
- ✓ Do not allow vehicle maintenance at the facility unless strictly limited and controlled.
- ✓ Continue the current practice of not using salt or deicers within the Zone I.

Encourage residents to utilize local household hazardous waste collection days and supply information about BMPs for household hazardous waste management.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Cliffside Apartments is commended for initial design of the system and efforts to minimize access to the wellhead efforts to protect the water supply. You are encouraged to review and adopt the key recommendations listed in the Wellhead Protection Plan, those listed above and those following:

#### Priority Recommendations:

- ✓ Prohibit public access to the well by locking facilities and installing a fence as necessary. Fencing is an eligible project under the Department's competitive Wellhead Protection Grant Program. If funds are available, each spring DEP posts a new Request for Response for the grant program (RFR). Visit the DEP websites for information at <http://www.state.ma.us/dep/brp/mf/othergrt.htm> and <http://www.state.ma.us/dep/brp/dws/grants.htm>.

#### Zone I:

- ✓ Prohibit any new non-water supply activities in Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism.
- ✓ Use BMPs within the Zone I and restrict activities that could pose a threat to the water supply.
- ✓ If it is not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and the certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the wellhead.

#### Facilities Management:

- ✓ Review uses within the maintenance department and facilities and implement standard operating procedures regarding proper storage, use and disposal of hazardous materials.
- ✓ Upgrade all hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Encourage or supply opportunities for use of household hazardous waste drop off.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in Sunderland to include Cliffside Apartments IWPA in Aquifer Protection District Bylaws, and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available. Refer to the Wellhead protection Plan prepared for your facility and follow the recommendations.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding Sources:**

The Department's Source Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. Please note: if funds are available, each spring DEP posts a new Request for Response for the grant program (RFR). Visit the DEP <http://www.state.ma.us/dep/brp/mf/othergrt.htm> and <http://www.state.ma.us/dep/brp/dws/grants.htm> for information about available funds.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to promote discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Pond Ridge Condominium Association

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 11, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Pond Ridge Condominiums
<i>PWS Address</i>	Montague Road
<i>City/Town</i>	Sunderland, Massachusetts
<i>PWS ID Number</i>	1289002
<i>Local Contact</i>	Mr. William Barton
<i>Phone Number</i>	(800) 340-6041

<i>Source Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1289002-01G	240	600	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Pond Ridge Condominium complex is located on the east side of Route 47, Montague Road, in Sunderland. The facility served by the public water system consists of three buildings: the Mt. Toby Apartments, the condominiums and the "farm house", with a total of 30 units that are heated by a natural gas fuel source. Currently, approximately 90 people reside at the complex. Sunderland does have a municipal water system but it does not serve this section of town. There is no municipal sewer available and therefore all of the facilities are served by on-site wastewater disposal.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Water is supplied by a single source, Well #1. Well #1 is located immediately adjacent to the Pond Ridge Condominium building and is a 400 feet deep, 6-inch diameter well drilled into the bedrock aquifer. The well is set within an underground pit. The casing extends 8-inches above the floor of the pit which is cement.

The Zone I is the area immediately around the wellhead, while the Interim Wellhead Protection Area (IWPA) is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be smaller or much larger than the IWPA. The Zone I and IWPA radii for Well #1 are 240 feet and 600 feet, respectively. The protective radii were based on maximum water use at the facility. Please refer to the attached map that shows the Zone I and IWPA radii.

The complex is located in an area where the overburden is mapped as sand and gravel less than 50 feet deep. The bedrock is mapped as the Mt. Toby Formation, Jurassic age sedimentary rocks, conglomerate and arkosic sandstone. There is no evidence of a protective till or clay layer in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Condominium well water is not treated at this time. Public water suppliers are required to monitor water quality at the facility. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **Transportation corridors/parking; and,**
3. **Residential development.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and/or IWPA, as seen in Table 2.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP before expanding or modifying the system.
Transportation corridors/parking	Yes	Yes	Moderate	Continue working with the community to manage stormwater and limit road salt usage.
High density/low density residential	No	Yes	Moderate	Provide BMPs for household hazardous materials management. Use IPM for lawn maintenance.
Septic system components	Yes	Yes	Moderate	Maintain systems and educate residents regarding disposal of waste.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**1. Non-conforming Zone I** – Zone I restrictions allow only water supply related activities or non-threatening activities in Zone I. Currently, the system does not meet DEP's Zone I requirements as the Zone I includes a road, parking, housing and septic system components.

### Recommendations:

- ✓ Do not allow any additional non-water supply activities in the Zone I.
- ✓ Inspect the casing regularly to ensure the integrity of the cap and seal and to ensure there is no standing water near the casing.
- ✓ Continue to prohibit storage and use of hazardous materials in Zone I.
- ✓ Control activities in Zone I as is reasonable.

**2. Transportation corridor/parking** – Montague Road and residential and facility parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.

### Recommendations:

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- ✓ Continue to manage on-site stormwater to ensure it flows away from the well.

**3. Residential Land Uses** – The condominium complex consists of 30 units and there are approximately 6 other residences. All utilize on-site septic disposal systems, which are within the IWPA with some components within the Zone I. The complex utilizes electric heat. However, it is unknown what fuel sources the surrounding residences utilize. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained,

they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

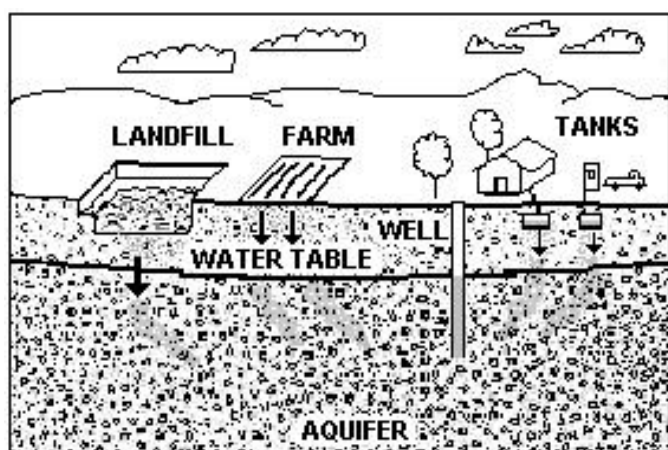


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

#### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" attached to this report and at the DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Pond Ridge Condominium is commended for current practices of limiting access to the wellhead area and not using pesticides or fertilizers near the well. Review and adopt the key recommendations above and following:

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Direct stormwater away from well.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers, petroleum products or road salt within the Zone I.

#### Facilities Management:

- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Continue to educate the residents and control the use of household hazardous materials in the Zone I.

#### Planning:

- ✓ Work with your community to include your IWPA in the water supply protection district along with other public water supplies in town.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Consider long term planning for the system that includes maintenance of the water and wastewater systems.

#### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the

attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
TWIN BROOK CAMPING AREA



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Twin Brook Camping Area
<i>PWS Address</i>	1234 Colebrook River Rd
<i>City/Town</i>	Tolland, Massachusetts
<i>PWS ID Number</i>	1297002

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Spring #1	1297002-01G	112	427	High	Moderate
Spring #2	1297002-02G	150	448	High	Low

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

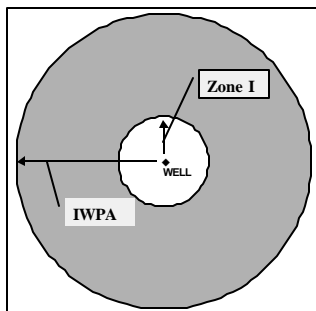
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for  
SPRING #1 (1297002-01G)**

Zone I = 112 ft.  
IWPA = 427 ft.



### How Was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the construction and vulnerable nature of the shallow dug wells and past incidents of bacteria reported in the samples from the sources. Water from both sources is disinfected prior to distribution. The **moderate** susceptibility to potential non-microbial threats for 01G is based on the buildings, activities and local roads within the Zone I and the IWPA. The non-microbial threat susceptibility for source 02G is **low**.

This source water assessment report is based on information provided by you on your Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, a Sanitary Survey, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Brookside Village

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 10, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	Brookside Village
<i><b>PWS Address</b></i>	Stafford Road
<i><b>City/Town</b></i>	Wales, Massachusetts
<i><b>PWS ID Number</b></i>	1306001
<i><b>Local Contact</b></i>	Mr. David Anderson
<i><b>Phone Number</b></i>	413-245-9300

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well # 2	1306001-02G	250	784	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Brookside Village is a mobile home park for retired citizens and is located in Wales, a small town in southwestern Massachusetts along the Connecticut border. The park accommodates 64 units with a total population of approximately 80 to 90 residents. There is no municipal water system or wastewater disposal in Wales, therefore, the facility is served by one on-site well with one emergency well and individual septic disposal systems (some are shared systems). The facility is presently proposing upgrades to the wastewater disposal system.



### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

This report addresses only the active Well #2 (02G) which is located southeast of the main residential area. Well #1 (emergency source) is a 15 feet deep, 9-feet in diameter (caisson type) well located in the center of the facility that was replaced in 1983 with Well #2. Well #2 is an infiltration area that is 46 x 24 x 14 feet deep, (8 feet deep at the shallow end). The area was excavated and backfilled with 1.5-inch stone. In the deeper half of the infiltration area, nine, 6.5 feet diameter well tiles were installed with the source intake set in the center tile. The construction was within an unconfined sand aquifer with an "impervious" material backfilled from 6 feet below grade to the surface with a topsoil finish to grade. The intake is set in the center tile and the centrifugal pump is located in the adjacent pump house.

There is no surficial geology map available for the area; however, based on observations, the source is located on the edge of a narrow valley filled with sand and gravel and wetland deposits. The source construction diagrams indicate the source is on the edge of the bedrock valley and the deposits are primarily fine-grained material underlain by till. The USGS state bedrock map shows metamorphic rock, sulfidic mica schist and amphibolite of the Partridge Formation. There is no record of a confining, protective clay layer in the protection area of the source. Sources located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The Zone I is the area immediately surrounding the well and the Interim Wellhead Protection Area, (IWPA) provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I for an infiltration system, such as this one, is a 250 feet radial area from the outside edges of the source area. The IWPA for the source is a radius of 784 feet centered on the source. The IWPA radius is based on the maximum average daily water use as reported by the system. A review of the annual reports indicates that the system use fluctuates seasonally and is also related to leaks. Although water use has decreased somewhat due to diligence in leak detection and repair, the IWPA remains at 784 feet. Please refer to the attached map of the Zone I and IWPA.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Aquatic wildlife	Yes	Yes	Moderate /High	Control beaver activity to protect the source from flooding.
Fuel Storage Above Ground	Yes	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Transportation Corridor	Yes	Yes	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brn/dws/](http://www.state.ma.us/dep/brn/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-feet to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The well serving the facility has no treatment at this time however, water is disinfected prior to distribution. The DEP requires public water suppliers to monitor the quality of the water frequently. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Zone I;**
2. **Aquatic wildlife;**
3. **Residential Land Uses; and**
4. **Transportation Corridor.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – The facility owns the Zone I area around the source and the land uses include an access road, woods, water storage tank and wetland. The system is in compliance with Zone I restrictions.

### Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the source.
- ✓ Control beaver activity to prevent flooding near the source.

2. **Aquatic wildlife** - A wetland and pond are located within the Zone I and IWPA. Beavers, ducks and other wildlife waste in and around the pond is a potential source of contamination to the water supply.

### Recommendation:

- ✓ Control the beaver activities to prevent flooding of the source area. Contact DEP

for assistance in permitting beaver controls.

3. **Residential Land Uses** – Brookside Village utilizes on-site septic disposal and is presently working with the DEP to stay in compliance with wastewater requirements. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store. Require that fuel lines are sleeved to protect from leaks.

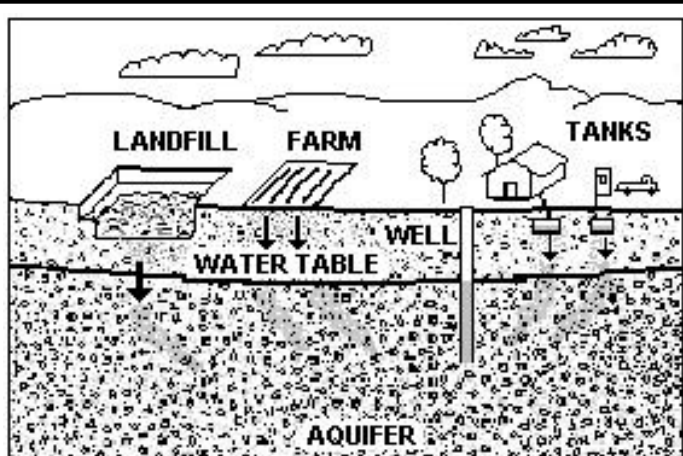


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on the following DEP website [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider a bylaw requiring that replacement heating/hotwater systems not be fueled by fuel oil or kerosene. Encourage maintenance of those tanks that exist and encourage conversion to propane.

4. **Transportation Corridor** – Even minor roads and parking areas are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

### Recommendation:

- ✓ Contact the local emergency responders to ensure that the IWPA is included in Emergency Response Planning and monitor activities in Brookside to ensure residents manage hazardous household waste.

Implementing the following recommendations will reduce the system’s susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the source’s susceptibility to contamination. Brookside Village is commended for past efforts to protect the sources by posting signs in the Zone I and educating tenants on wellhead protection issues. The facility should continue efforts in water supply protection through reviewing and adopting the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict the use of salt within Zone I and drain stormwater away from the source.
- ✓ Conduct regular inspections of the Zone I especially with respect to beaver activity and the integrity of sanitary seals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider well relocation or installation of a deep well if water quality at the source deteriorates or land uses cannot be controlled.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement.

Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

- ✓ Continue to educate residents regarding BMPs for household hazardous waste management and septic management.
- ✓ Maintain septic systems.

### Planning:

- ✓ Work with local officials in town to assist in the development of an Aquifer Protection District with appropriate Bylaws and include the facility’s IWPA within the district.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the wells and is treated according to DEP guidance.
- ✓ Continue efforts to maintain and upgrade wastewater disposal systems.

**Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at the following DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Source Water Assessment Program (SWAP) Report for Wales Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
May 31, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Wales Elementary School
<i>PWS Address</i>	41 Main Street, State Route 19
<i>City/Town</i>	Wales, Massachusetts
<i>PWS ID Number</i>	1306004
<i>Local Contact</i>	Ms. Rosemary Joseph, Superintendent
<i>Phone Number</i>	508-347-3077

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well 1	1306004-01G	140	442	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Wales Elementary School, an elementary school with a total staff and student population of approximately 230 people, is located immediately on the west side of Main Street, State Route 19 in the center of Wales, a rural, residential setting. Well 1 is the sole source of water for the school and is on the northeast side of the school, within 12 feet of the school wall. The Zone I protective radius for Well 1 is 121 feet and the Interim Wellhead Protection Area (IWPA) radius is 430 feet. The protective radii were based on metered usage for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller. The actual recharge area for the Wales Elementary

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

School well is likely larger than the mapped IWPA, at least in the northeasterly direction. A confirmed hazardous materials release site located at 12 Haynes Hill, has been identified by the DEP as the source of volatile organic compounds reported in the school water supply as well as several other private wells in the immediate vicinity. That location is outside of the mapped IWPA.

Well 1, a 6-inch diameter well, is reportedly drilled to a final depth of approximately 240 feet. The well is located in a 5-foot deep pit, with a locking bulkhead cover; the wellhead extends approximately 4 feet above the bottom of the pit. A drain was installed to prevent flooding of the pit. There is no record of final construction of the well or of the materials encountered during drilling. Geologic mapping of the area indicates the overburden material at the school consists of undifferentiated sand and gravel deposits but does not indicate the depth of the deposits. Because of the depth of the well, it is assumed to be a bedrock well. The bedrock is mapped as quartzofeldspathic gneiss and sillimanite schist, the upper schist member, of the Hamilton Reservoir Formation. Bedrock wells drilled in these conditions are considered to be highly vulnerable to potential contamination from the ground surface because there is no significant barrier to prevent surface contamination from migrating into the bedrock aquifer.

### Water Quality

The Wales Elementary School well water is treated for removal of volatile organic compounds and disinfected prior to distribution. In 1997, 1,1-Dichloroethylene and trichloroethylene (TCE) were reported in the water supply at the school. MA DEP conducted an investigation, which identified a source location of a TCE release that also impacted several private wells initiating a "clean-up" at the release site. The water at the school is treated and filtered to remove naturally occurring iron and manganese and then passes through granular activated carbon adsorption filters to remove the volatile organic compounds then is disinfected by an ultraviolet disinfection unit. The sediment filter backwash water is stored in a tight tank that is pumped out approximately once per month. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1. For further information on the status of the release site, refer to the information in Appendix A and contact the Bureau of Waste Site Cleanup (BWSC) at 413-784-1100 about Tier 1B site Release Tracking Number (RTN – 1-11899).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
Confirmed hazardous materials/oil release site, septic system	No	No	**	Tier 1B - RTN 1-11899 disposal of TCE through septic system (see Appendix A)
Fuel Storage Below Ground (UST)	Yes	No	High	Underground heating oil tank
Auto repair/body shop (Very Small Quantity Generator – VSQG)	No	Yes	High	Petroleum products use and storage
Septic tank & Tight tank	No	Yes	Moderate	See septic systems brochure in the attachments
Low density residential w/septic	No	Yes	Moderate	See septic system/pesticide attachments
Floor drain	Yes	No	Moderate	Boiler room
School Structures, athletic fields Parking lot & roads	Yes	Yes	Moderate	Fertilizer and pesticide usage. Road salt and disposal of household type hazardous waste

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/). \*\* See Appendix A



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½-mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material, such as clay, that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## 2. Discussion of Land Uses in the Protection Areas

Several land uses and activities within the drinking water supply protection areas are potential sources of contamination.

### Key issues include:

1. **Non-conforming Activities in Zone I**
2. **Confirmed Release Site RTN 1-11899**
3. **An Underground Fuel Oil Storage Tank in Zone I**
4. **Auto Repair/Body Shop**
5. **Floor drain in boiler room**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high and several moderately ranked land uses or activities in the IWPA, as seen in Table 2.

**1. Non-conforming activities in Zone I** – Currently, the well does not meet DEP's restrictions that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, roads, parking areas, and property owned by an auto repair and autobody repair facility. The public water supplier does not own all land encompassed by the Zone I and therefore has no control over some of the activities. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well.

**2. Confirmed Release Site RTN 1-11899** – The location identified by the DEP as the source of the TCE impacting the school well as well as several other nearby wells was a residential septic system through which solvents were improperly disposed of. The site 12 Haynes Hill Road is located approximately 2,300 feet from the school.

### Recommendation:

- ✓ For complete information regarding this site, contact the DEP BWSC and ask about Tier 1B site RTN 1-11899. Periodically monitor the status of the site.

**3. Underground Fuel Oil Storage Tank (UST)** – The fuel oil storage tank was replaced in 1994 in compliance with current requirements for double wall construction and leak detection. An UST in the Zone I containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel.

### Recommendations:

- ✓ Closely monitor activities associated with the fuel tank refilling and usage.
- ✓ Any further modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**4. Auto Repair/Body Shop** - Part of the Zone I extends to the adjacent property, which is an auto body shop. The potential threats are from petroleum products, solvents and paints stored and used on site as well as the vehicles parked on site. Proper management of hazardous materials

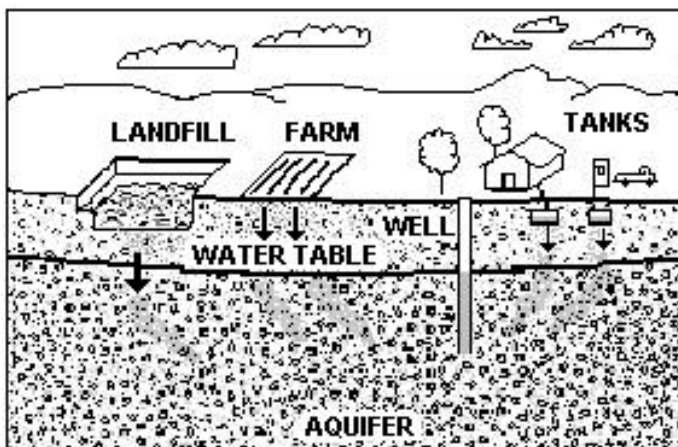


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

minimizes the threat from commercial activities. Currently, there is no evidence indicating adverse environmental impact from this facility. The facility is a registered Very Small Quantity Generator of Hazardous Waste (VSQG) – MAV000015464.

### Recommendations:

- ✓ Maintain communication with the business owner and support their efforts to use Best Management Practices for the handling of hazardous materials and salvage vehicles.

**6. Floor Drain** - The floor drain in the boiler room may be required to protect the school from accidental plumbing failure. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and requires other discharges to go either to a tight tank or to a sanitary sewer. There is no sanitary sewer available in Wales. Therefore, the floor drain must be protected to prevent discharges through the floor drain such as boiler blowdown or accidental release of oil during maintenance. There are no hazardous materials stored in the boiler room and an outside contractor maintains the boiler.

### Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any oil line leaks would drain back to the tank or minimal oil would leak to the boiler room. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blowdown generated during maintenance.

Other activities noted during the assessments were parking, roadways and storm water catch basins. Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Work with the Town to have the catch basins maintained and cleaned. In addition, residential homes surround the school. Residential homes pose minimal threat to public and private water supplies provided home owners use Best Management Practices with respect to septic system maintenance and disposal practices, household hazardous waste, auto car and lawn and pest control. Work with your community to continue providing information regarding the use of Best Management Practices. The DEP can provide your community with information on how to develop public outreach and support local protection measures.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The staff of the Wales Elementary School is commended for their current attention to detail regarding the treatment unit and protection

measures. The Wales Elementary School in conjunction with the district and local officials should review and adopt the key recommendations above and the following:

### Zone I and IWPA:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Maintain the tight tank as appropriate.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Monitor all non-compliant activities in the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

- ✓ Prohibit public access to the well by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check area for accidental spills and leaks, etc.
- ✓ Maintain road and parking lot drainage and catch basins.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider raising the wellhead above grade to prevent flooding of the wellhead.

### **Training and Education:**

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies or other references).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### **Facilities Management:**

- ✓ Monitor water quality from the treatment unit regularly to determine efficiency of the treatment. Conduct diligent maintenance on the units and recommend alternative treatment as required to maintain water quality.
- ✓ Prohibit non-sanitary wastewater discharges to on-site septic systems. Post sinks as appropriate.
- ✓ Do not store any hazardous materials in rooms with floor drains that drain to the ground or septic systems.
- ✓ Generally there is little use of hazardous materials in an elementary school. However, periodically during cleaning or maintenance, household hazardous waste is generated. Contact the Massachusetts Office of Technical Assistance at 617-626-1061 regarding proper hazardous material use, storage, disposal, emergency response, and best management practices. Develop a procedure for storage and disposal of any hazardous materials either through the Town's hazardous waste collection days or through other appropriate means. Make the process simple to ensure participation of all appropriate custodial staff. The school will have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ Septic system components should be inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Wellheads should be raised above grade to prevent accidental flooding of the well.
- ✓ Concrete wellhead protective pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers, including pole mounted transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Contact the utility if the area near the transformer has tree limbs that could endanger the transformer in a storm.

### **Planning:**

- ✓ Work with local officials in Wales to encourage the development of and implementation of Aquifer Protection Bylaws that would include the school's IWPA. The Department can assist your community in developing wellhead protection bylaws.
- ✓ Review and update as appropriate, your plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers address Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Wellhead Protection Grant or the Source Water Protection Technical Assistance/Land Management Grant Program. For additional information, please refer to the attached program fact sheet. Please note that each year the program is funded, the Department posts a new Request for Response (RFR – grant application form) for the Grant programs on the internet on or about May 1; the due date is generally on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Making Wellhead Protection Work in Massachusetts
- Preparing a Wellhead Protection Plan
- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

## **5. Appendices**

1. APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites

# **APPENDIX 1**

## **Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Sites Within or Proximal to Wellhead Protection Areas**

DEP's data layer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Tier Classification</b>	<b>Town</b>	<b>Contaminant Type</b>
1-11899	12 Haynes Hill	Tier 1B	Wales	Solvents

For more location information, please see the attached map. The map lists the release sites by RTN.



# Source Water Assessment Program (SWAP) Report For Silver Meadow

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 10, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Silver Meadow</b>
<i>PWS Address</i>	<b>Monson Rd.</b>
<i>City/Town</i>	<b>Wales, Massachusetts</b>
<i>PWS ID Number</i>	<b>1306006</b>
<i>Local Contact</i>	<b>Larry Nelson, HAP Inc.</b>
<i>Phone Number</i>	<b>413-785-1251 x291</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1306006-01G	172	467	Low
Well #2	1306006-02G	172	467	Low

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Silver Meadow is a residential complex for the elderly, serving 40 residents in the rural community of Wales. The community is served by on-site septic disposal systems and two, 6-inch diameter bedrock water supply wells. Well #1 is 342-feet deep with an approved daily withdrawal rate of 3,046 gallons per day (GPD). Well #2 is 242-feet deep with an approved daily withdrawal rate of 2,970 GPD. The Zone I and Interim Wellhead Protection Area (IWPA) radii for both are 172 feet and 467 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

As previously mentioned, both wells are bedrock-drilled wells. There is no surficial geology map available; however, based on the observed bedrock outcrops and topography at the site, it is assumed the surficial geology is a thin layer of till. The bedrock in the area USGS maps as metamorphic rocks, mainly gneisses and schists. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well water serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

Both wells for Silver Meadow were approved through the DEP NSA (New Source Approval) in 2000. As a result, the Zone I is in full compliance and the IWPA has few activities that are potential sources of contamination.

### Key issues within the IWPA include:

1. **High density housing with associated septic system;**
2. **Floor drains in boiler rooms; and**
3. **Internal transportation corridors and parking.**

The overall ranking of susceptibility to contamination for wells 1 and 2 is low, based on the presence of few threatening land uses or activities in the Zone I and IWPA.

**1. High density housing with associated septic system** – Most of the facility is located within the IWPA of the wells, along with associated parking, driveways and sewer lines to the septic. The most significant threats from residential areas are the septic systems due to lack of maintenance and improper disposal of non-sanitary waste. Another potential threat from residential users is mismanagement of household waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Encourage residents to utilize local household hazardous waste collection days.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
High density housing with associated septic system	No	Well #1	Low	See septic system brochure, leach field outside IWPA
Floor Drains in Boiler Rooms	No	Well #1	Low	Leach field outside IWPA, be sure the floor drains are in compliance with Department Regulations
Internal Transportation Corridors and Parking	No	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Underground Storage Tank (Propane)	No	Both Wells	Low	Propane storage less of a threat
Herbicide and Pesticide use	No	Both Wells	Moderate	Do not use herbicides or pesticides in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



- ✓ Supply residents with information about BMPs for household hazardous waste management.

**2. Floor Drains in Boiler Room** – Oil storage is in aboveground tanks located in the boiler room with adequate secondary containment. Floor drains in the boiler room, discharge to the septic system and are equipped with oil/water separators. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be protected to prevent boiler blow down or other prohibited discharges through the floor drain. Oil/water separators must be maintained to provide adequate protection. In addition, in the case of a catastrophic failure the separator may be overwhelmed.

**Recommendations:**

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
- ✓ Maintain oil/water separator and keep any hazardous materials from the septic system.
- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Require a policy and a plan should be in place during maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

**3. Internal transportation corridors and parking** – Within the IWPA of both wells, there are roadways into and around the facility and parking. Potential exists for hazardous material spills or leaks from any vehicle traveling in these areas.

**Recommendations:**

- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Monitor roadside for spills and leaks.

Other potential threats in the IWPA at the time of the site visit include an Underground Storage Tank (UST) for propane fuel, and herbicide and pesticide use. A UST is categorized as a high potential threat for contamination; however, since the fuel stored is propane the threat is minimal. Pesticide and herbicide use is prohibited in the Zone I, and should be used minimally if at all in the IWPA.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Silver Meadow is commended for the facility design that directs storm water runoff away from the wells, utilizing propane fuel and fully complying with DEP's Zone I requirements. Silver Meadow should review and adopt the key recommendations above and the following:

**Priority Recommendations:**

- ✓ Lock all raw well water sample stations.
- ✓ Consult your cross connection inspector regarding the integrity of the sampling taps.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Consult with the regional UIC program coordinator.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

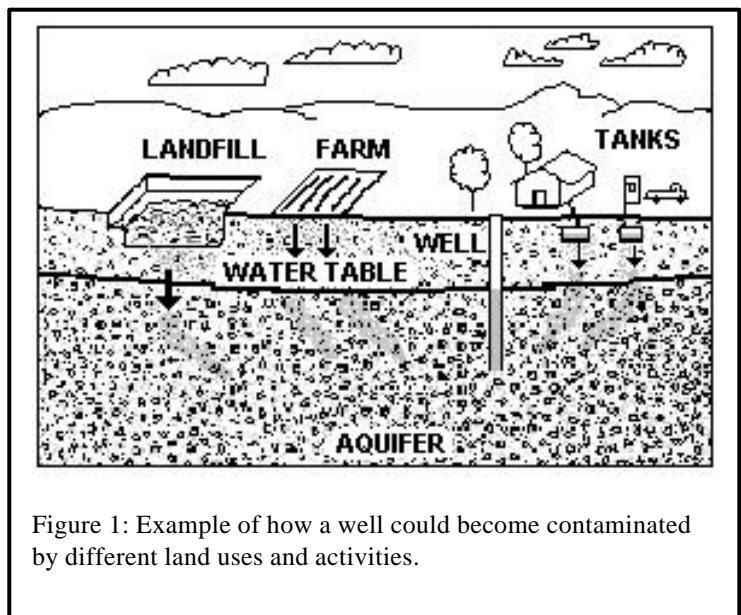


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, leaks of above ground tanks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator.
- ✓ Post drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer (refer to attachment "Industrial Floor Drain Brochure").
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete or earthen protective wellhead collars should slope away from well and well casing.
- ✓ Keep the area near electrical transformers free of tree limbs that could endanger the transformer in a storm.

### Planning:

- ✓ Work with local officials in Wales to develop wellhead protection bylaws and include the Silver Meadow IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed

Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Ware Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	Ware Water Department
<i>PWS Address</i>	Ware Department of Public Works 4 ½ Church Street
<i>City/Town</i>	Ware, Massachusetts
<i>PWS ID</i>	1309000
<i>Local Contact</i>	Mr. Gilbert St. George-Sorel
<i>Phone Number</i>	(413) 967-9620

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells and reservoirs may be threatened by many potential contaminant sources, including stormwater runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

The attached map shows Zone I and II protection areas for your groundwater supplies.

### System Susceptibility:

**High**

### Groundwater Sources

MA GIS Zone II ID #: 490

Susceptibility: High

Well Name	Source ID#
Wells 1/2/3	1309000-01G
Well #4 — Snow Pond	1309000-02G
Cistern	1309000-04G

MA GIS Zone II ID #: 193

Susceptibility: High

Well Name	Source ID#
Dismal Swamp Well	1309000-03G

Ware is a medium sized, west-central Massachusetts town located just south of the Quabbin Reservoir in the foothills of the central highlands. The town developed primarily as an industrial mill center in the mid-1800s utilizing waterpower from the Ware River. A few of the mills still exist, but Ware is now primarily a rural, residential community. The Ware Water Department maintains and operates four groundwater sources located within two distinct sand and gravel aquifers. Wells 1/2/3 (01G) is a set of three, 8 x 18-inch diameter, gravel packed wells installed in 1978 to replace a shallow tubular wellfield just north of Pines Pond. Well #4, Snow Pond Well (02G), is an 18 x 24-inch diameter, gravel packed well located just north of Pines Pond and just south of Snow Pond.

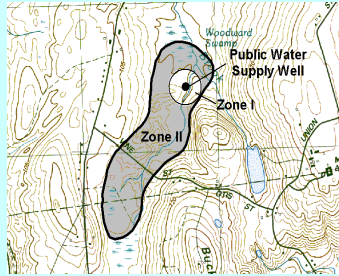
The Cistern (04G) is a 41-foot diameter, caisson (collection cistern) located adjacent to the Pines Pond that served as the original water source for the Town for a few years in the late-1800s. These three sources (01G, 02G and 04G) are located within the same relatively shallow, unconfined sand and gravel aquifer along the Muddy Brook valley. The Zone II (GIS ID # 470) for wells (01G, 02G and 04G) was delineated as part of the SWAP program utilizing empirical data, analytical modeling and geologic mapping. Part of the Zone II #470, in the Muddy Brook valley for sources 01G and 02G, is served by municipal sewer, however, there is no sewer in the northern part of the Zone II. The Zone II #470, (upgradient extent terminates at the positive recharge boundary, Hardwick Pond.)

The Dismal Swamp well (03G), is a 12 x 18-inch diameter gravel packed well located immediately adjacent to the Ware River. The Ware River valley is also a relatively shallow, unconfined sand and gravel aquifer. The Dismal Swamp Well (03G) was developed to supplement the existing wells during times of peak demand. The Zone II #193, in the Ware river valley for the Dismal Swamp well, was delineated as part of the New Source Approval Process utilizing empirical data from an extended pumping test, geologic mapping and a numerical model. The Zone II area includes a small private airstrip, the river, a few residences, a propane distributor and a small office. There are no municipal sewers in this area.

Data from well development and geologic mapping indicate both aquifers are glacially deepened bedrock valleys that were filled with sand and gravel during the glacial recession (melting) some 12,000 years ago. The sand and gravel deposits in the narrow bedrock valley aquifers utilized by these wells are mapped as glacial outwash deposits of kames, kame terraces and recent stream outwash deposits. Boring logs indicate some local, isolated fine sand, silt or clay deposits overlying the coarse aquifer sand and gravel, however, there is no indication of a continuous confining unit.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



The bedrock underlying the area is primarily mapped as schist of the Littleton Formation, the Monson Gneiss and the Hardwick Quartz Diorite.

Wells located in unconfined aquifers are considered to be highly vulnerable to contamination because the hydrogeologic barrier (i.e. clay) is not continuous throughout the developed recharge area. Please refer to the attached map to view the boundaries of the Zone II for each well.

Water from the wells is not treated. A chlorinator is available for disinfected prior to distribution if it is required.

For current information on monitoring results and treatment and for a copy of the most recent Consumer Confidence Report, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

### Section 2: Land Uses in the Protection Areas

The Zone II area (# 490) for the wells located in Muddy Brook valley is 55%

forest, water or wetland, with the remaining area a mix of low to high density residential land use (22%), a few commercial activities and agricultural activities. The most densely developed southern portion of the Zone II near the wells in the Muddy Brook valley is served by municipal sewer. However, the area immediately upgradient of the Snow Pond Well (04G) is not served by municipal sewer. The Zone II (# 193) for the Dismal Swamp well is primarily wetland, forest and open land (57%). The proximity of recreational, residential and commercial activities that utilize

on-site septic disposal pose the greatest threat to the water sources. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

#### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Residential Land Uses
3. Transportation Corridors/Utility Right-of-way
4. Hazardous Materials Storage and Use
5. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the entire system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for the wells is a 400-foot radial area around each of the wellheads. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Activities other than those directly related to the public water supply are prohibited within the Zone I. However, many public water supply sources were developed prior to promulgation of the Department's regulation and contain non-water supply activities such as homes and public roads. The Town owns the entire Zone I for the recently developed Dismal Swamp well (03G). The wells in the Muddy Brook valley are non-conforming, with residential and recreational land uses in the Zone I. The Zone I of the Cistern source has a baseball field with vehicle parking, residential homes that are connected to the sewer system and the Water Department's maintenance garage.

### What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.



The following non-conforming activities are located within the Zone I of the wells:

**Wells #1, 2 and 3 (01G)** - Wells #1, 2 and 3 (source 01G) are located within a residential area of town. A portion of Pleasant Street, two homes and portions of two other lots are located within the Zone I of source 01G; the three lots with homes are served by Town sewer and water. There is also a town baseball field within the Zone I; parking occurs within the Zone I during events at the field.

**Well #4 (02G)** - Well #4 is located north of the source 01G (Wells 1, 2 and 3). A portion of Pleasant Street, two homes (one served by a private septic system and one served by the Town sewer system) are located within the Zone I.

**Cistern (04G)** - The Cistern (04G) is located south of source 01G. The baseball field and parking area, the Water Department's motor control building (old pumping station), the storage (maintenance) garage and residential backyards are within the Zone I of the Cistern. The motor control building has secondary containment for the petroleum products stored on site.

### What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

### Zone I Recommendations:

- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- ✓ Ensure that residents are aware of best management practices (BMPs) with respect to household hazardous materials and lawn chemicals.
- ✓ Where it is feasible, remove all hazardous materials from the Zone I of the cistern. Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals, specifically at the maintenance garage.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I. Ensure that the Town does not use pesticides or fertilizers on the baseball field.
- ✓ Periodically inspect the stormwater runoff in the vicinity of the sources to ensure the runoff is directed away from the sources.
- ✓ Agreement Options - Until land is available for acquisition or preservation, attempt to obtain a Memorandum of Understanding and Right of First Refusal. A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system,

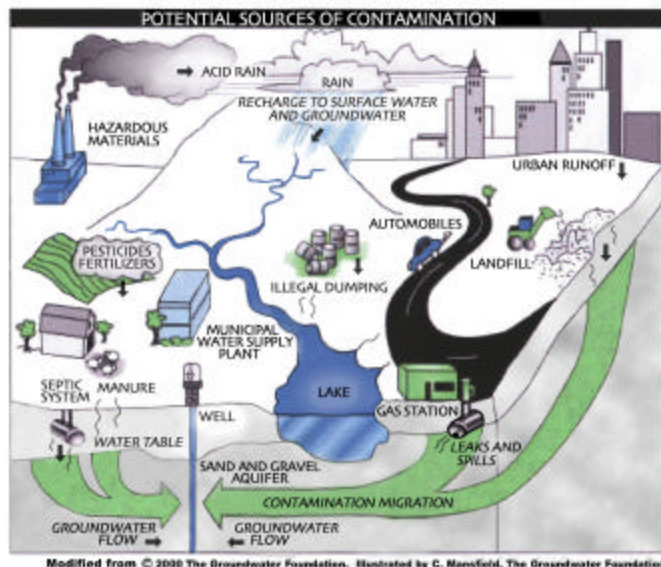


Figure 1: Sample watershed with examples of potential sources of contamination

the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. See Right of First Refusal in the Appendices.

**3. Residential Land Uses** – The Muddy Brook Zone II (#470) area has 20% residential land use; the Ware River Zone II (#193) has 6% residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Water Supply Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II	Potential Contaminant Sources*
<b>Agriculture</b>				
Dairy Farm	1	H	470	Improper handling of manure (microbial contaminants); pesticides, petroleum products (handling, storage)
Crop land	Few	H	470	Pesticides, petroleum products from farm equipment
Livestock Operations (Non-commercial)	1	M	470	Improper handling of manure (microbial contaminants) pesticides, petroleum products (handling, storage)
<b>Miscellaneous</b>				
21E Release sites	2	-	470	Refer questions to the Bureau of Waste Site Cleanup for current status of sites
Aquatic Wildlife	Occasional	M/H	470	Microbial contaminants
Transportation Corridors/Utility Right-of-way	Numerous	M/H	Both	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Sand & Gravel operations	2	M	470	Accidental leaks or spills of fuels and other hazardous materials; clandestine dumping
Cemeteries	2	M	470	Leaks and spills of petroleum products (lawn care), historic and recent embalming fluids
Auto Repair Shops/Construction	1	H	470	Leaks and spills of petroleum products and other hazardous materials
Airport (private small grass strip)	1	L/M	193	Leaks and spills of petroleum products and other hazardous materials
Railroad Tracks	1	H	193	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Propane distributor	1	M	193	Delivery vehicles
Auto Sales	1	H	470	Accidental leaks or spills of fuels and other hazardous materials
<b>Residential</b>				
Fuel Oil Storage (at residences)	Numerous Few	M/H	470 193	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening/ Hay	Numerous Few	M	470 193	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Few	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

**\*THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with the Board of Health, the DPW and the Department to identify areas within the Zone I and Zone II where source protection would occur if municipal sewer was available.

**4. Transportation Corridors and Utility Rights-of-way** - There are numerous roads and a utility right-of-way through the Muddy Brook Zone II (#470). There are roadways, railroad tracks, and an airport (private with a short, grass runway) in the Ware River Zone I (#193). Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, or accidental spills. Clandestine dumping is identified as a significant threat to the water supplies and roadways; remote roadways in particular, are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Right-of-way maintenance can also be a source of contamination. Water suppliers should ensure that the utility managers are using accurate maps of source protection areas.

Railroad tracks run directly through the Zone II and Zone III of the Dismal Well. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

**Transportation Corridor Recommendations:**

- ✓ Regularly inspect Zone IIs for illegal dumping and spills.
- ✓ Continue working with local emergency response (ER) teams to ensure that any spills within the protection areas can be effectively contained. Be sure that ER teams for the highway, fire and police departments and the railway company are aware of the protection areas. Provide them with an updated map, if necessary.
- ✓ Work with the municipality or MA Highway to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Consider working with local watershed groups to institute a Storm Drain Stenciling Program, if there is not a local program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet

available, work with town officials to investigate mapping options such as the upcoming NPDES Phase II Stormwater Rule requiring some communities to complete stormwater outfall mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.

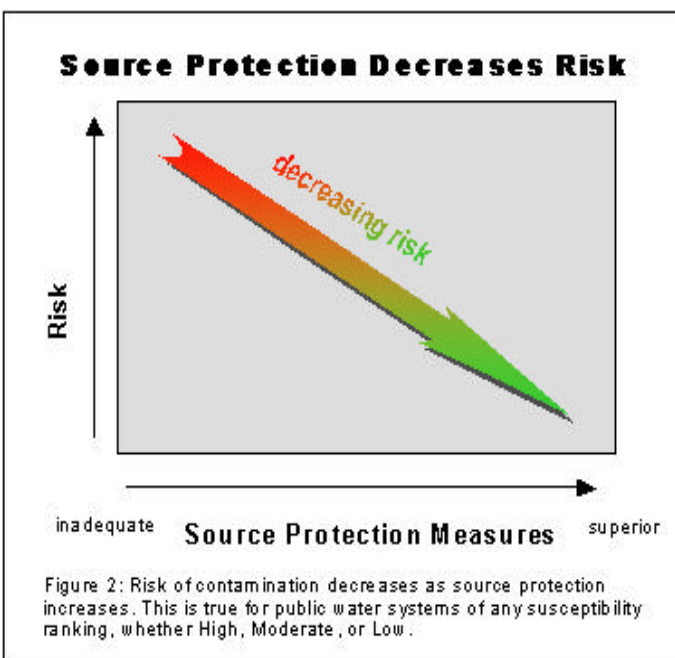
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad and other utility right-of-way Yearly Operating Plans (YOP) to ensure that water supplies are protected during vegetation control or maintenance of the utility.
- ✓ Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call the local office in Hadley at 413-585-1000. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**5. Hazardous Materials Storage and Use** – Approximately 1% of the Muddy Brook Zone II (#470) is mapped as commercial/industrial land use. Many businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

Activities within the Zone III may also pose a potential threat to the water supply. Specifically, under conditions when the river contributes water to the aquifer, an accidental release to the river may pose a threat to water quality. This report does not include facilities located upgradient of the wells along the Ware River.

### Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



### Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with the local Board of Health and businesses to register facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts and local floor drain requirements. See the brochure "Industrial Floor Drains" for more information.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site <http://search.sc.egov>.



usda.gov/. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call the local office in Hadley at 413-585-1000.

**4. Agricultural Activities** – A small percentage, approximately 3%, of the watershed is agricultural land use. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. Frequently, farms and other large commercial facilities have maintenance garages for equipment and storage tanks. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the products they store.

**Agricultural Activities Recommendations:**

- ✓ Inform commercial farmers in your protection areas of your water supply protection area and encourage them to work with (or continue working with) the USDA Natural Resources Conservation Service (NRCS) and to have a farm plan to protect water supplies. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Hadley at 413-585-1000, for assistance
- ✓ Encourage farmers and any large commercial property owners to incorporate an Integrated Pest Management (IPM) approach into their pest (plant and insect) management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Very often farms and large commercial properties store maintenance equipment and associated petroleum products on site. Promote the use of BMPs for fuel storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Encourage farmers and property managers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One

program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

- ✓ Consider providing hobby farmers with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources. Planning Boards, Boards of Health and Conservation Commissions may be able to provide information on BMPs to hobby farmers as well.

**6. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. The Ware Planning Board recently adopted protective bylaws that area in compliance with DEP's Wellhead Protection regulation 310 CMR 22.21(2). A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Ware currently does not have a Wellhead Protection Plan.

In some circumstances, under stressed "pumping" conditions, rivers may "lose" or contribute water to an aquifer when the well is located near the river. Therefore, activities within the Zone III along a river that flows into the Zone II, may pose a potential threat to water supply wells adjacent to rivers. Specifically, under conditions when the river contributes water to the aquifer, a release of hazardous materials to the river from an industry or an automobile/train accident may pose a threat to water quality in the well. This report does not include facilities located upgradient of the Zone II along the Ware River or north of Hardwick Pond.

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

**Protection Planning Recommendations:**

- ✓ Prepare a Wellhead Protection Plan and establish a protection team. Refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan" and continue current efforts in wellhead protection planning.
- ✓ Inventory facilities upstream within the Zone III, and incorporate any potentially high threat facilities into your Emergency Response Action Plan.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses.

Contact facilities and industries on the river to be sure they include the Water Department in their Emergency Response contact list if there is a release to the river that may impact water quality. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

**Section 3: Source Water Protection Conclusions and Recommendations****Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- adopting protective bylaws, and
- proactive inspections and knowledge of the Zone II protection areas.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone Is regularly, and when feasible, remove any non-water supply activities.
- ✓ As funds are available and it is feasible, consider extending municipal sewer lines to areas within the Zone I and II that are closest to the wells.
- ✓ Educate residents on ways they can help protect drinking water sources.
- ✓ Continue working with emergency response teams to ensure that they are aware of the stormwater drainage in the Zone II and to cooperate on responding to spills or accidents.
- ✓ Consider working with the local fire department to inventory, as appropriate, non/commercial and residential USTs within the Zone IIs.
- ✓ Partner with local businesses in the Zone II and the Zone III areas to ensure the proper storage, handling, and disposal of hazardous materials and to include the Water Department in their emergency response plans.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Visit DEP's Nonpoint Source Pollution web site for additional information and assistance on NPS pollution at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and the town boards.



➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to water supply contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it is a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge areas are located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the grant program. Each spring, if funding is available, DEP posts a new Request for Response for the grant program (RFR) on the website <http://www.comm-pass.com/>.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection areas. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities
- C. Underground Storage Facility
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b> <b>01G, 02G and 04G</b> <b>YES</b> <b>03G</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Monitor activities in Zone I.
Are the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I regularly inspected?	<b>YES</b>	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Monitor non-water supply activities in Zone I; investigate options for removing these activities.
<b>Municipal Controls</b> (Zoning Bylaws/Ordinances, Health Regulations, and General Bylaws/Ordinances)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	<b>YES</b>	Reference <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model bylaws, health regulations, drinking water regulations and current/updated guidance documents.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Contact communities upstream of the sources on the Ware River and provide them with information that your sources are downstream. Assist and encourage them in the active protection of the watershed lands.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Consider augmenting the plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams. Communicate with facilities upstream of the Dismal Swamp well to be sure they are aware that the Water Department should be included in their ER plans in the event of a release to the river.
Does the municipality have a watershed and wellhead protection committee?	<b>YES</b>	Continue the committee and include representatives from citizens' groups, neighboring communities, and the business community.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	Request that the Board of Health consider adoption of hazardous materials handling regulations. For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> .
Does the PWS provide watershed protection education?	<b>YES</b>	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and Zone III.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Gilbertville Bottled Gas	109 Gilbertville Road	Ware	Hazardous Waste Generator	Very Small Hazardous Waste Generator	Propane delivery
	Hardwick Auto Sales	551 Greenwich Road	Ware	Hazardous Waste Generator	Very Small Hazardous Waste Generator	Auto Sales
	D. Petracon & Sons/ D & P Bus Co.	100 Pleasant Street	Ware	Waste Oil Generator	Very Small Hazardous Waste Generator/Oil	Sales Repair/Bus terminal
	Four Seasons Repair	53 Crescent Street	Ware	Hazardous Waste Generator	Very Small Hazardous Waste Generator/Oil	Sales Repair/Bus terminal
	Construction & Auto Repair Company		Ware	Not registered		Auto Body & Repair

For information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>  
Additional information provided by individual owners

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-12283	Residence	Ware	Oil
1-12042	Residence	Ware	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



# Source Water Assessment and Protection (SWAP) Report For Oakwood Park

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
April 18, 2002

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Oakwood Park</b>
<i>PWS Address</i>	<b>Monson Turnpike Road</b>
<i>City/Town</i>	<b>Ware, Massachusetts</b>
<i>PWS ID Number</i>	<b>1309001</b>
<i>Local Contact</i>	<b>Ms. Cecile Marquis</b>
<i>Phone Number</i>	<b>603-578-9200</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1309001-01G	266	683	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Oakwood Park is a residential, mobile home park, located in a rural section of Ware. The park has approximately 65 trailers with 211 residents. The community is served by an on-site septic disposal with individual septic tanks serving multiple trailers, force mains and a central leachfield located outside of the Zone I. There is a single, 6-inch diameter, 220 feet deep well that serves the facility. The Zone I and Interim Wellhead Protection Area (IWPA) radii for the well are 266 feet and 683 feet, respectively.

The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

area has not been delineated. The protective areas have been calculated based on the metered water usage reported to the Department. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

USGS mapping shows the area indicates coarse sand and gravel overburden with no indication of a confining, protective clay layer. The bedrock in the area is generally mapped as a biotite-feldspar rich gneiss of the Massabessic Gneiss Complex. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers, such as clay, that can prevent contaminant migration. At the time this report was prepared the water did not require and was not treated. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are several activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming activities in the Zone I;**
2. **Aboveground storage tanks;**
3. **Septic system;**
4. **Residential homes; and**
5. **Transportation corridor.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2. The facility does have a Wellhead Protection Plan prepared by Northeast Rural Water Association.

**1. Nonconforming activities in the Zone I** – Currently, the water supplier does not own or control the entire Zone I area. Please note that systems not meeting DEP Zone I requirements for ownership or control must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. There are non-water supply activities occurring within the Zone I, such as structures (residents), parking, roadway, sewer force main at the time of the visit there were several vehicles parked

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
High Density Housing	Yes	Yes	Moderate	Use BMPs, encourage participation in household hazardous waste collection days. Prohibit or control vehicle maintenance.
Transportation Corridors and Parking	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from well
Aboveground Storage Tanks	Yes	Yes	Moderate	Require replacement, maintenance, containment and monitoring of tanks. Consider conversion to propane.
Septic system components	Yes	Yes	Moderate	Tanks, pressure main, leach field. See attached brochure

\* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

behind the abandoned residence. In addition, there was standing water in the well house with the distribution line under water. The facility has located the emergency generator and fuel outside of the Zone I and has not permitted any new trailers within the Zone I. However, the generator is a diesel fuel generator. The Park has a policy to not use any salt, pesticides or fertilizers in Zone I.

### Recommendations:

- ✓ Continue the current controls for access to the wellhead area.
- ✓ Consider well replacement if existing threats cannot be mitigated.
- ✓ Continue current practice of no use or storage of pesticides, fertilizers or road salt within the Zone I.
- ✓ Raise the wellhead out of the pit and ensure that there is no standing water in the pit.

**2. Aboveground Storage Tank (UST)** – There are numerous ASTs located in the IWPA. Although the facility has been diligent in removing the emergency generator and fuel source to outside of the Zone I, the majority of the homes are located topographically upgradient of the well and have outdoor ASTs for fuel oil. If managed improperly, ASTs can be a potential source of contamination due to leaks, spills or overfills of the chemicals they store.

### Recommendation:

- ✓ ASTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Require all of the homes with tanks 10 years of age or older to be replaced or have secondary containment. All tanks must be painted and on a pad. Consider a requirement to convert to propane over time.

**3. Septic Systems** – The facility's septic system is located within the IWPA. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste.

### Recommendations:

- ✓ Provide residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and

maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

- ✓ Prohibit septic tank cleaners, especially those with acids and solvents.

**4. Transportation Corridors** -- The Zone I and IWPA contain a municipal road, internal roads and parking. Transportation corridors can be a potential source of contamination from road salt and automotive leaks or spills. As storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, etc.

### Recommendations:

- ✓ Monitor parking areas and roads for accidental leaks and spills.
- ✓ Do not allow vehicle maintenance at the facility unless strictly limited and controlled.
- ✓ Continue the current practice of not using salt or deicers within the Zone I.
- ✓ Restrict access as is feasible.

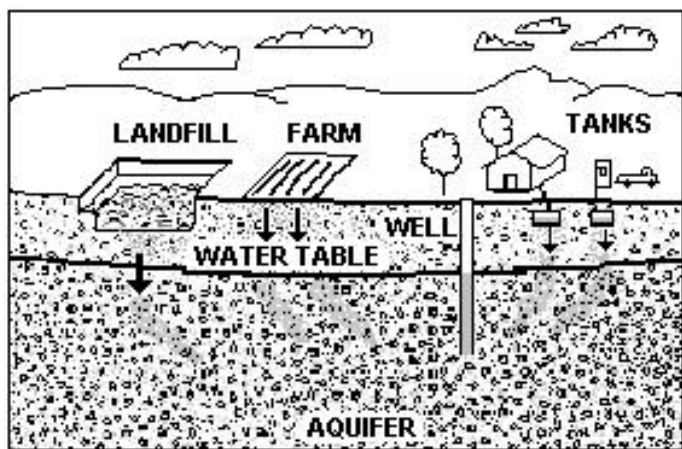


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and the town boards.

- ✓ Inspect the roadway near the water supply to ensure the runoff is directed away from the well.
- ✓ Work with the Town to have the road maintenance and runoff issues addressed as necessary.

Other potential threats noted during the site visit include vehicles stored within the Zone I behind the abandoned house. Encourage residents to utilize local household hazardous waste collection days and supply information about BMPs for household hazardous waste management.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Oakwood Park is commended for its staff's past efforts to protect the water supply. You are encouraged to review and adopt the key recommendations listed in the Wellhead Protection Plan, those listed above and those following:

### Priority Recommendations:

- ✓ Remove as is reasonable, all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated; investigate the potential to acquire land in the event a new source must be developed.
- ✓ Prohibit public access to the well by locking facilities and installing a fence as necessary. Fencing is an eligible project under the competitive grant program.

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Use BMPs within the Zone I and restrict activities that could pose a threat to the water supply.
- ✓ Continue policy of not using pesticides and fertilizers in Zone I.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane for power sources in areas utilizing fuel oil.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.

- ✓ Post drinking water protection area signs at key visibility locations away from the wellhead.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on all facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Provide technical information about proper disposal practices.
- ✓ Encourage the use of household hazardous waste drop off.

- ✓ Well casing should extend above ground and there should be no standing water around the wellhead. Install a passive drain if necessary. Take whatever steps are necessary to prevent flooding of wellhead.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

### **Planning:**

- ✓ Work with local officials in Ware to include Oakwood Park's IWPA in Aquifer Protection District Bylaws, and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available. Refer to the Wellhead protection Plan prepared for your facility and follow the recommendations.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Warren Water District

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

**Table 1: Public Water System (PWS) Information**

<b>PWS NAME</b>	Warren Water District
<b>PWS Address</b>	250 Comins Pond Road
<b>City/Town</b>	Warren, Massachusetts
<b>PWS ID Number</b>	2311000
<b>Local Contact</b>	Mr. John O'Neill
<b>Phone Number</b>	(413) 436-9819

<b>Well Name</b>	<b>Source ID#</b>	<b>Zone I (in feet)</b>	<b>Zone II #</b>	<b>Source Susceptibility</b>
Comins Pond Wellfield	2311000-01G	250	519	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Warren Water District obtain its water supply from a tubular wellfield located on the eastern shore of Comins Pond, approximately 9,000 feet north of Massachusetts Turnpike (Route I-90), and approximately 1,500 feet west of Bemis Road. The wellfield consists of twenty one 2-1/2 -inch wells and five (5) 8-inch wells. The wellfield has a Zone I which is essentially a 250 foot buffer around the perimeter of the wellfield. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II. The Warren Water District is currently in the approval process for another drinking water source which will

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date DRAFT Prepared:  
July 2, 2003

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

be located south of the current wellfield. An assessment of the proposed groundwater source is not included in this report.

The well is treated with sodium hydroxide solution for corrosion control. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment and for a copy of the most recent Consumer Confidence Report, please contact the Public Water System contact person listed above in Table 1.

Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

The majority of the land within the Zone II is forested with small areas of residential uses. Land uses and activities within the drinking water supply protection areas that are potential sources of contamination area as follows:

#### Key issues include:

1. **Inappropriate Activities in Zone I; and**
2. **Aquatic wild life.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of only moderate threat land use or activity in the Zone II, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains a home which is on town sewer, and some parking areas used by beach goers. Portable bathrooms are used on the town beach, which belongs to the town. The public water supplier owns and controls all land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking areas	Yes	Yes	Moderate	Provide drainage away from wells
Aquatic Wildlife	Yes	Yes	Low	Comins Pond
Structures (Served by public sewer)	Yes	Yes	Low	Non-water supply structures in Zone I

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

- ✓ Continue practicing the your no salt policy in the Zone 1.

2. **Aquatic wildlife** – Comins Pond lies in the protection area of the water supply. Ducks and other wildlife waste in and around the river are potential sources of contamination in the water supply.

### Recommendation:

- ✓ Discourage wildlife by prohibiting the feeding of ducks and wildlife.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Warren Water District should review and adopt the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ If the resident intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.

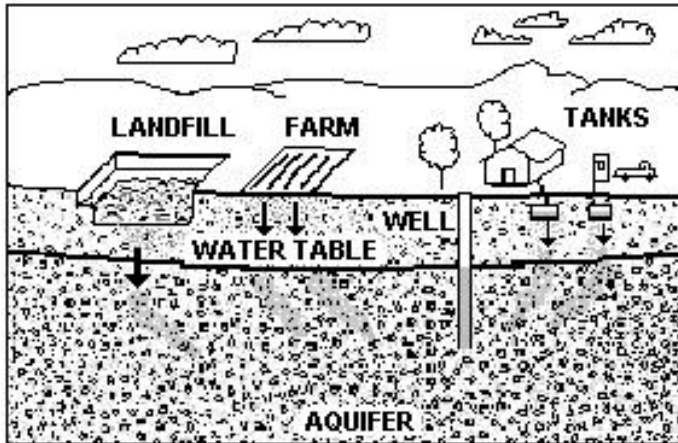


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Planning:

- ✓ Work with local officials in Warren to include the facility Zone II in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet.



### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Wellhead Protection Grant Program Fact Sheet

### **For More Information:**

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 4030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been made available to the public water supplier and town boards.



# Source Water Assessment Program (SWAP) Report for Warwick Community School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Warwick Community School
<i>PWS Address</i>	Winchester Road
<i>City/Town</i>	Warwick, Massachusetts
<i>PWS ID Number</i>	1312012
<i>Local Contact</i>	Ms. Dayle Doiron
<i>Phone Number</i>	413-498-2911

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1312012-01G	115	428	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

### The Well

Warwick Community School is a rural, elementary school located on the east side of Winchester Road (State Route 78) in Warwick. The school student and staff population is approximately 100 people per day and is served by a single potable supply well (Well #1) located south of the school.

The well has a Zone I protective radius of 115 feet and an Interim Wellhead Protection Area (IWPA) radius of 428 feet based on pumping test data and Zone I restrictions. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

well was tested and was shown to have a Safe Yield of 12,960 gallons per day (9.0 gpm) under the New Source Approval Process. However, due to Zone I land use restrictions that allow only drinking water activities within the Zone I, the approved rate for the well is restricted to 1,260 gpd (0.875 gpm). Well #1 is a 6-inch diameter well drilled to a depth of approximately 440 feet below ground. The driller's log states gravel and boulders were encountered from ground level to approximately 16 feet below ground, where bedrock was encountered. The bedrock was apparently highly weathered and the borehole was filled with cement to 70 feet and redrilled to stabilize the walls of the boring. Forty feet of casing was cemented into place with 24-inches above ground. The geologic mapping of the area identified the bedrock as a quartz-mica-sillimanite schist and gneiss of the Ammanousuc volcanics series dating from the Ordovician. Variable amounts of epidote, garnet and shpene are noted. The water does not require and is, at the time this report was prepared, not treated. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information. Please note that the "ortho-photograph" in the attached map was taken prior to the construction of the school and therefore does not show the school. The school is located north of the well and parts of the playing field, the basketball court and the leach field are within the IWPA.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, it was noted the few land uses and activities within the drinking water supply protection areas are potential sources of contamination.

#### Key issues include:

1. **Septic System components in the IWPA**
2. **Floor drain in boiler room**

The well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Septic systems** - The septic system leach field is located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems or discharge from the boiler room are also potential sources of contamination to the water supply.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System components (leachfield)	No	Yes	Moderate	Refer to attached septic system fact sheet.
Floor Drain in the boiler room to septic system	No	Yes	Moderate	Floor drain must be protected from accidental spills
Passive Recreation	No	Yes	Low	Athletic Fields

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator.
- ✓ Refer to the appendices for more information regarding septic systems. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine regulatory requirements. If you wish to participate in the Town household hazardous waste pick-up day.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

2. **Floor drain in the boiler room** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. Floor drains in an area that contains hazardous materials must be discharged to a sewer or a tight tank. The boiler room at the Warwick Community School has a floor drain that is assumed to discharge to the septic system.

## Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. A written policy and plan should be in place during maintenance operations, especially when oil filters are changed. Request that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.

Other activities that were noted during the assessment were the multiple earth removal operations. The sand and gravel mining operations appear to be located down gradient to the well. The school's oil tank was constructed in accordance with current standards for containment and is located outside of the IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Warwick Community School is commended for current protection measures.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply signs key location such along the access road and in the parking area.

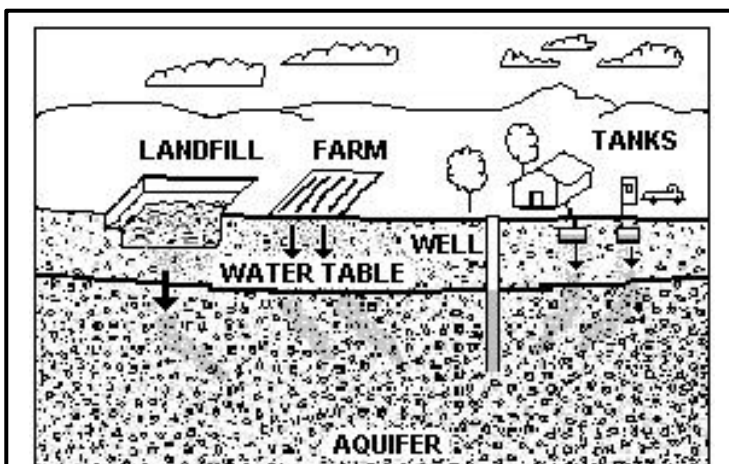


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.

### Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete or earthen collars around the wellhead should slope away from well.
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate.

### Planning:

- ✓ Work with local officials in Warwick to include the school well's IWPA in an Aquifer Protection District Bylaws and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at

<http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Grant Program Fact Sheet
- Source Protection Sign Order Form
- Very Small Quantity Generator (VSQG) information



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
BUCKSTEEP MANOR



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 27, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Bucksteep Manor
<i>PWS Address</i>	885 Washington Mountain Road
<i>City/Town</i>	Washington, Massachusetts
<i>PWS ID Number</i>	1313006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1313006-01G	100	410	High	High
Well # 2	1313006-02G	203	507	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



### What is Susceptibility?

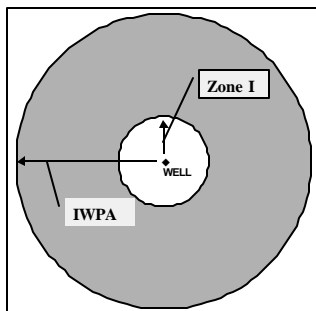
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #2  
(1313006-02G)**

Zone I = 203 ft.  
IWPA = 507 ft.



### How Was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the underground storage of fuel oil within the Zone I and IWPA. Other moderate non-microbial threats include buildings, local roads and vehicle parking within the Zone Is and IWPAs.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, Sanitary Survey, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone Is and IWPAs regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the wells (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone Is;
- ✓ do not use pesticides, fertilizers or road salt within the Zone Is;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
DEM WENDELL STATE FOREST



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 24, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	DEM Wendell State Forest
<i>PWS Address</i>	392 Montague Rd.
<i>City/Town</i>	Wendell, Massachusetts
<i>PWS ID Number</i>	1319001

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
HQ Bldg Well	1319001-01G	150	448	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

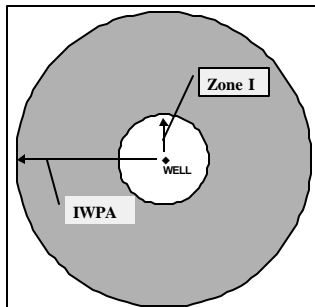
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for  
HEADQUARTERS BLDG  
WELL (1319001-01G)**

Zone I = 150 ft.  
IWPA = 448 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as gasoline, oil, or paint within the Zone I and the IWPA. Other moderate threats include local roads and parking areas within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection

## Source Water Assessment Program (SWAP) Report

### for

## Lake Grove School

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

#### SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 8, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Lake Grove School</b>
<i>PWS Address</i>	<b>6 Farley Street</b>
<i>City/Town</i>	<b>Wendell, Massachusetts</b>
<i>PWS ID Number</i>	<b>1319004</b>
<i>Local Contact</i>	<b>Mr. Drew Paton</b>
<i>Phone Number</i>	<b>978-544-6913</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well # 1	11319004-01G	143	443	High
Well # 4	11319004-04G	190	489	High

#### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. School officials, citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your school.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

### 1. Description of the Water System

Lake Grove School is a residential school located in the community of Wendell, for males age 12 to 18 with behavioral disabilities. Wendell does not have municipal water or wastewater disposal, therefore the facility is served by on-site water supply, and on-site septic disposal. The school maintains two active bedrock well sources, Well #1 (1319004-01G) and Well #4 (1319004-04G). Two wells, Wells #2 and #3 (02G and 03G), have been disconnected from the potable water system and reclassified as emergency sources. The school continues to maintain the wells and utilizes them as non-potable water sources. Emergency sources will not be addressed further in this

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

report. Well #1 is a 6inch diameter bedrock well, adjacent to the Administration Building and serves only day use facilities on the north side of Farley Street. Metered use for Well #1 is 1,932 gallons per day. Well #4 was installed and permitted through the New Source Approval Process in 2000 when the school expanded and renovated their facilities. Well #4 is a bedrock well, 440 feet deep and has an approved withdrawal rate of 3,981 gallons per day or 2.76 gallons per minute.

The Zone I for a well is the protected area immediately surrounding the wellhead while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPA for the Well #1 is 143 feet and 443 feet, respectively; the Zone I and IWPA radii for Well #4, as approved in 2000, are 190 feet and 489 feet, respectively. The Zone I radius for Well #1 was based on metered water use in 2000.

The school is located in the Massachusetts central highlands; the bedrock is mapped as the Poplar Mountain Gneiss. The overburden is a relatively thin layer of till (ground moraine) with bedrock commonly exposed. There is no record of a confining, protective clay layer in the vicinity of the wells. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

Water from the wells serving the facility is not treated at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone Is and IWPAs and Table 1 for additional information regarding the location of the wells and activities within the protection areas.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential High School	Well #1	Both	Moderate	Well #1 is non-conforming; all school facilities within IWPA Well #4.
Transformers	Yes	Both	Low	MODF (oil) – potential leaks. If there is any question about PCBs in the transformers oil, request confirmation from the electric company.
Maintenance facilities	No	Both	High	Use BMPs for handling, storage and use of hazardous materials.
Parking lots, internal transportation corridors	Well #1	Both	Moderate	Request limited use of road salt and provide drainage away from well.
Septic system components	Yes	Both wells	Moderate	Use BMPs to maintain system and prohibit disposal of non-sanitary waste to systems. School utilizes a Bioclere wastewater treatment system for wastewater disposal.
Athletic fields/landscaping	No	Well #4	Low	Do not use pesticides and fertilizers. Consider IPM if it is appropriate.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Institutional use - residential high school,**
3. **Transportation corridors, and**
4. **Hazardous materials management.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of one or more high ranking land uses or activities in the Zone I and IWPA of one of the sources, as seen in Table 2. The water use for development of the Zone I for Well #1 was based on data from 2000. The use has decreased since Well #4 has come on-line and it is anticipated that the Zone I radius will decrease to 100 feet and the IWPA will decrease somewhat to approximately 420 feet. In addition, the water supplier is planning to relocate the maintenance facility outside of the IWPA of both wells. If these changes occur, the system susceptibility could be lowered to moderate based on the removal of the high-risk threat (the maintenance facility) from the protection areas. The Department recommends the continued use of BMPs at that facility and that the new maintenance facility be designed with containment.

**1. Non-conforming Zone I**– Well #4, the school's main well, is in conformance with the Zone I requirements. Well #1, which has limited use, is non-conforming with respect to the Zone I requirements. DEP approval is required prior to increasing water use or modifying systems for sources that are not in conformance with Zone I requirements.

### Recommendations:

- ✓ Continue to monitor activities within the Zone I.
- ✓ Use Best Management Practices for handling all household hazardous materials, stormwater runoff, and septic system maintenance.
- ✓ Consider relocation of Well #1 if potential threats cannot be mitigated and water quality is impacted.

**2. Institutional use – Residential high school** - The facility is a residential school with all associated activities including dormitories, infirmary, recreational facilities, classrooms, maintenance facilities, parking, etc. Maintenance and services provided to the facility include all household hazardous materials including petroleum products for maintenance vehicles (lawn mowers, tractors, etc) paints and cleaning materials.

### Recommendations:

- ✓ Use BMPs for activities within close proximity to the wells.
- ✓ Continue monitoring and managing stormwater runoff, directing it away from the wellhead.
- ✓ Do not use pesticides or fertilizers within the Zone I of the wells. Utilize Integrated Pest Management (as practical) on campus to minimize the use of pesticides and nutrients in fertilizers.

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

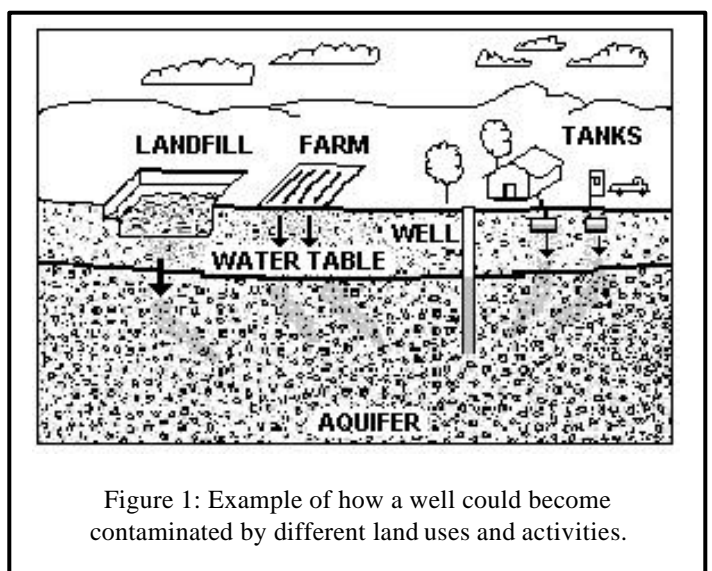


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

**3. Transportation corridors** – There are internal walkways/access roads within the IWPA of Well #4 and a main road through the protection area of Well #1. Roadway construction, maintenance, and typical use, even on low use roads can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals such as fuel oil. De-icing materials, automotive chemicals and other debris on roads and in parking areas, are picked up by stormwater and wash into catchbasins or to swales. Stormwater management issues on town roads should be addressed in cooperation with the Town.

#### Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Use minimal road deicers within the protective areas, and monitor the parking lot and roadside for spills and leaks.

**4. Hazardous Materials Storage and Use** – The school has small amounts of hazardous materials associated with maintenance at the school. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to discharge into a floor drain leading to the ground or directly to the ground. This includes floor drains in boiler rooms. The facility uses propane as a fuel source. However, floor drains in areas that hazardous materials make be discharged to, including boiler rooms, may not discharge to the septic system and should be connected to a tight tank. Contact the DEP Underground Injection Control Program (Rick Larson at 413-755-2207) if you require additional information.

#### Hazardous Materials Storage and Use Recommendations:

- ✓ Educate staff on best management practices for storage, use and handling of hazardous materials for protecting water supplies.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Lake Grove School is commended for developing Well #4 as an alternate source. Continue monitoring activities in the protection areas and review and adopt the key recommendations above and as follows:

#### Priority Recommendations:

- ✓ Review activities and practices at the maintenance facility. Continue use of BMPs for use and handling of hazardous materials.
- ✓ Maintain septic systems and prohibit inappropriate disposal into the systems.

#### Zone I:

- ✓ Prohibit any new non-water supply activities from the Zone I of Well #1.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of leaks or spills and regularly inspect the integrity of the well caps and seals around the wells.
- ✓ Do not use or store pesticides, fertilizers or hazardous materials within the Zone I.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices, including custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at locations where BMPs should be used.

**Facilities Management:**

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property. Do not use pesticide in Zone I. Incorporate an Integrated Pest Management (IPM) approach into their pest management programs. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Ensure that stormwater runoff is directed away from the water supplies.

**Planning:**

- ✓ Working with local officials in Wendell to include the Lake Grove School Zone I (Well #1) and the IWPA's in their emergency planning and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

**4. Attachments**

- ❖ Map of the Public Water Supply (PWS) Protection Area
- ❖ Recommended Source Protection Measures Fact Sheet



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**West Springfield Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i>PWS Name</i>	West Springfield Water Department
<i>PWS Address</i>	26 Central Street
<i>City/Town</i>	West Springfield, Massachusetts
<i>PWS ID Number</i>	1325000
<i>Local Contact</i>	Mr. Jeffrey Auer, Superintendent
<i>Phone Number</i>	413-263-3230

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells and reservoirs may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### System Susceptibility:

**High**

### Groundwater Sources

MA GIS Zone II #: 205

Susceptibility: High

Well Name	Source ID#
GP Well #1 Southwick	1325000-01G
GP Well #1 Southwick	1325000-02G
GP Well #1 Southwick	1325000-03G
GP Well #1 Southwick	1325000-04G

### Surface Water Sources

Source Name	Susceptibility: High
Bear Hole Reservoir	1325000-01S

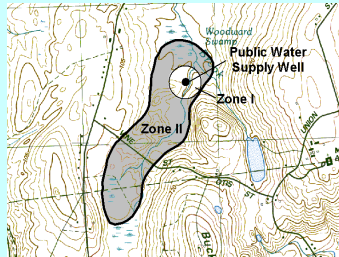
West Springfield is a mid-sized industrial, residential community in western Massachusetts. West Springfield Water Department receives its water from four wells and one reservoir, and also purchases water from the Springfield Water & Sewer Commission. A copy of the SWAP report for the Springfield system will be forwarded upon completion. The four wells for the West Springfield Water Department are located in the Town of Southwick near the border with Westfield. The wells are in relatively close proximity to each other within the same unconfined, sand and gravel aquifer. Each well has a Zone I of 400 feet and the Zone II recharge area was delineated utilizing empirical data, analytical modeling and geologic mapping. The aquifer is an extensive, very productive, sand and gravel, buried valley aquifer. The aquifer was formed during the recession of the glaciers about 14,000 years ago when the water from the melting glaciers deposited sand and gravel in the bedrock valleys. There are two other municipalities, Westfield and Southwick, that have wells located within the same aquifer. The Zone II for West Springfield's wells extends to the aquifer watershed boundary, south of the Congomond Lakes, and is partially within the town of Suffield, Connecticut. There is no evidence of a protective, confining clay layer above the sand and gravel aquifer. Wells located in this type of an aquifer are considered to be highly vulnerable to contamination from activities on the ground surface due to the absence of hydrogeologic barriers (i.e. confining clay layer) that can prevent contaminant migration. The water from the wells is

treated through a granular activated carbon unit to remove the pesticides (ethylene dibromide) EDB and (dichloropropane) DCP, and disinfected prior to distribution. EDB and DCP are chemical compounds that had been used on fields located adjacent to the wells. Please refer to the attached map of the Zone II.

The Bearhole Reservoir is located in West Springfield and its watershed extends into the cities of Holyoke and Westfield. The majority of the watershed includes steep-sided valley walls, although the center of the watershed lies within a broad, brook valley along the Paucatuck Brook and extending north into Holyoke. The Ashley Pond Reservoirs, part of Holyoke's water supply, are located in the northern part of the Bearhole Reservoir watershed. The overburden material in the valley is primarily stratified drift, composed of sand and gravel, while the steeper valley walls and in the upland areas there is a thin cover of glacial till or exposed bedrock. The bedrock in the watershed is

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



mapped as the volcanic and sedimentary rocks of the Hartford Basin. Please refer to the attached map of the watershed.

Water from the reservoir is filtered and disinfected prior to distribution. For current information regarding water quality monitoring results and treatment, please contact the Public Water System contact person listed in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

### Section 2: Land Uses in the Protection Areas

The Zone II and watershed for West Springfield are primarily a mixture of agriculture, forest and residential land uses, with smaller portions consisting of commercial and industrial land uses (refer to attached maps for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

#### Key Land Uses and Protection Issues include:

1. Non-conforming Zone I
2. Activities in Zone A
3. Residential Land Uses
4. Transportation Corridors
5. Hazardous Materials Storage and Use
6. Agricultural Activities
7. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. West Springfield owns or controls the Zone Is for Wells 01G and 04G, but does not own or control the Zone Is for Well 02G and 03G. Only water supply activities or non-threatening activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

**Well 02G** - A tobacco field extends into the Zone I for Well 02G.

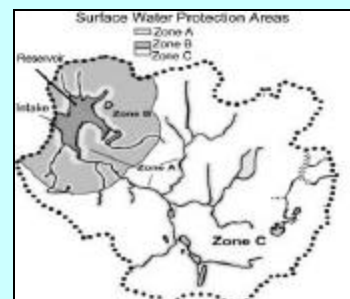
**Well 03G** - A hayfield extends into the Zone I for Well 03G.

#### Zone I Recommendations:

- ✓ To the extent possible, remove all activities from the Zone Is that are not related to water supply to comply with DEP's Zone I requirements.
- ✓ Notify landowners in the Zone Is to be sure they are aware they are in a Zone I and/or Zone II and comply with all regulations that may be applicable to activities they are conducting, such as the use of pesticides.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Enter into an agreement of Right of First Refusal with land owners in the Zone Is and/or try to acquire conservation restrictions.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone Is.

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.





- ✓ Prohibit new non-water supply activities from the Zone Is.

**2. Activities in Zone A** - The Zone A for reservoirs includes all areas within 400 feet around the reservoir and within 200 feet of either side of all streams that flow into the reservoir. Land use activities within the Zone A for Bear Hole Reservoir which may have an impact on surface water sources include: transportation corridors, including the Mass. Turnpike (I-90) and local roads; active railroad tracks; stormwater runoff; and aquatic wildlife. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc.

**Zone A Recommendations:**

- ✓ To the extent possible, remove all prohibited activities from the Zone A to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Prohibit new non-water supply related activities from the Zone A.

**What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**3. Residential Land Uses** – Approximately 16% of the Zone II and a small portion of the watershed consist of residential areas. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Some of the areas have access to public sewers, while other areas within the protection areas rely on septic systems for wastewater management. Common potential sources of contamination from residential areas include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they can be a source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the stored fuel oil.



Figure 1: Sample watershed with examples of potential sources of contamination

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Water Supply Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Land Uses	Quantity	Threat	Zone II	Watershed	Potential Contaminant Sources*
<b>Agricultural</b>					
Fertilizer Storage or Use	Numerous	M	Yes	-	Leaks, spills, improper handling, or over-application of fertilizers
Forestry Operation	Numerous	M	Yes	Yes	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Livestock Operations	Numerous	M	Yes	-	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	Numerous	H	Yes	-	Manure (microbial contaminants): improper handling
Pesticide Storage or Use (tobacco)	Numerous	H	Yes	-	Leaks, spills, improper handling, or over-application of pesticides, leaching
Slaughterhouse	1	M	Yes	-	Manure and other waste products (microbial contaminants): improper handling
<b>Commercial</b>					
Gas Stations	1	H	Yes	-	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Auto Repair Shops / Service Stations	4	H	Yes	-	Spills, leaks, or improper handling of automotive fluids, and solvents (1 in CT)
Boat Yards/Builders (Marina)	1	H	Yes	-	Fuels, paints, and solvents: spills, leaks, or improper handling
Bus Terminals	1	H	Yes	-	Fuels and maintenance chemicals: spills, leaks, or improper handling
Junk Yards and Salvage Yards	1	H	Yes	-	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Golf course	2	M	Yes	-	Leaks, spills, of hazardous materials, over application of pesticides and herbicides
Repair Shops (Engine, Appliances)	1	H	Yes	-	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Mining	2	M	Yes	Yes	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Railroad Track and Depot	1	H	-	Yes	Spills, leaks, or improper handling of maintenance and shipped materials

**Table 2: Land Use in the Water Supply Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat**	Zone II	Watershed	Potential Contaminant Sources*
<b>Industrial</b>					
Food Processors	2	L	Yes	-	Cleaners, other chemicals, microbial contaminants: spills, leaks, or improper handling or storage.
Metal Fabricators	1	H	Yes	-	Solvents and other chemicals: spills, leaks, or improper handling or storage
Fuel Oil Distributors	2	H	Yes	-	Fuel oil: spills, leaks, or improper handling or storage (1 in MA and 1 in CT)
Hazardous Materials Storage	1	H	Yes	-	Hazardous materials: spills, leaks, or improper handling or storage
Hazardous Waste Storage, Treatment and Recycling	1	H	Yes	-	Hazardous materials: spills, leaks, or improper handling or storage
Industry/ Industrial Parks	1	H	Yes	-	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	Yes	-	Solvents and metal tailings: spills, leaks, or improper handling
<b>Residential</b>					
Fuel Oil Storage (at residences)	Numerous	M	Yes	Yes	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Yes	Yes	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Yes	Yes	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>					
Aboveground Storage Tanks	Several	M	Yes	Yes	Materials stored in tanks: spills, leaks, or improper handling (1 in CT)
Aquatic Wildlife	Some	L/H	Yes	Yes	Microbial contaminants
Underground Storage Tanks	2	H	Yes	-	1 in CT (oil), 2 in MA (gasoline/diesel)
Clandestine Dumping	Some	H	Yes	Yes	Improper use or storage of fuels and other chemicals
Fishing/Boating	Some	L/M	Yes	-	Fuel and other chemical spills, microbial contaminants
Schools	3	M	Yes	-	Laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transportation Corridors	Numerous	H	Yes	Yes	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

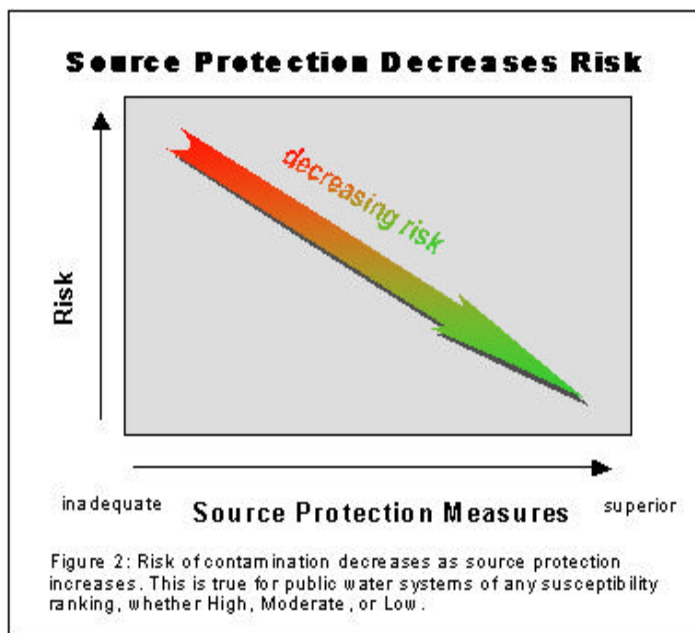
**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

**4. Transportation Corridors** - Interstate 90, the Mass. Pike, runs through the Zone A for Bear Hole Reservoir. Local roads and trails are common in the Zone II and watershed. Roadway construction, maintenance, typical highway use and illegal or inappropriate trail use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

There are numerous unpaved, roadways as well as legal (authorized) and illegal (unauthorized) trails throughout the watershed and Zone IIs. Most of these roadways and trails through the watershed are not maintained at all or are minimally maintained. The resulting erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoirs, potentially resulting in additional drinking water treatment costs if they continue unchecked and pose a potential threat to public health and safety. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Evidence of access to the watershed was observed and anecdotal information indicates access throughout the watershed. Unmanaged access may also result in vandalism, illegal dumping and access to the reservoir, resulting in water quality impairment.



Railroad tracks run through the Zone A and watershed. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

**Transportation Corridor Recommendations:**

- ✓ Regularly inspect the watershed and Zone II for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the City and Massachusetts Highway Department to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to

investigate mapping options such as the NPDES Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.
- ✓ Notify City and host town officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP).

**5. Hazardous Materials Storage and Use** – A small portion of the Zone II for West Springfield’s wells has commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in USTs/ASTs. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a septic system or floor drain leading directly to the ground.

There are mining operations within both the watershed and the Zone II. The MA DEP recommends continued vigorous monitoring of these activities with respect to hazardous materials management and closure activities at those facilities.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II .
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

**Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ The USDA has various funding sources for governmental agencies, non-governmental organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. If it is needed, funding may be available for the school and bus terminal in Southwick. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ext.4.

**6. Agricultural Activities, Hobby Farmers and Golf Course** – The Zone II consists of approximately 17% agricultural land use including animals and cropland. There are also two golf courses and several non-commercial farms. Please note that this percentage does not include the area located in Connecticut that contains large tobacco farms within the Zone II. Massachusetts pesticide regulations do not apply in Connecticut. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed and those permitted to be applied in protection areas are regulated by the MA Pesticide Bureau. Often farms and golf courses use and store hazardous materials. Proper handling, management and disposal of hazardous materials is imperative in protection areas. In addition, if managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the stored fuel oil.

**Agricultural Activities, Hobby Farmers and Golf Course Recommendations:**

- ✓ Work with farmers in your protection areas to make them aware of your

water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Recommend that they contact NRCS for assistance.

- ✓ Encourage the farmers and lawn and course managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of best management practices (BMPs) for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with farmers and lawn and course managers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.
- ✓ The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP), may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ A copy of this report will be sent to the planner in the Town of Suffield, CT.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

#### **For More Information**

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and the town boards.

**7. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, West Springfield has a watershed protection bylaw, but should update it to be in compliance with DEP's Surface Water Protection regulations 310 CMR 22.20 (b) and (c). Holyoke and Westfield do not have local controls that meet DEP's Surface Water Protection regulations 310 CMR 22.20 (b) and (c) to protect the watershed lands. Southwick's water supply protection district includes the West Springfield Zone II. The Southwick bylaws meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Wellhead Protection and Surface Water Supply Protection Plans coordinate community efforts, identify protection strategies, establish timeframes for implementation, and provide a forum for public participation. West Springfield has a Surface Water Supply Protection Plan which should be implemented and updated as necessary to reflect actions taken and new or changing conditions that occur. There are resources available to help communities develop plans for protecting drinking water supply sources.

#### **Protection Planning Recommendations:**

- ✓ Develop a Wellhead Protection Plan. Establish a protection team with officials from Southwick and Suffield, CT and refer to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ If local surface water supply protection controls do not meet the current regulations, adopt controls that meet 310 CMR 22.20 (b) and (c). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

- ✓ Work together with the Town of Southwick to establish a working relationship with the town of Suffield Connecticut regarding wellhead protection. Contact Lori Mathieu of the CT Department of Public Health at 860-509-7333 or the CT DEP for more information about how CT regulates activities within water supply protection areas. The MA DEP has forwarded an outline of the protection area within CT to the CT DPH and information regarding the land uses observed. A copy of this SWAP report has also been forwarded to the Suffield, CT Town Planner for their review and consideration.

During the SWAP assessment for Southwick and West Springfield, it was noted by the Southwick Water Department and confirmed through review of CT DPH online information, a public water system West Service Corp., is located within the West Springfield Zone II, and owns and operates two wells just over the CT border in Suffield. The MA DEP was not able to obtain any information about potential sources of contamination in this area other than what was observed through a windshield survey of the Zone II area. There is a metal building between what are believed to be the well houses for the system with several vehicles parked at the facility. A fuel pump was observed behind the metal building. It is not clear if the fuel pump was connected to an underground or aboveground storage tank. There is a crane parked immediately adjacent to what appeared to be the well house for one of the wells. The majority of the land use in the Zone II area within Connecticut is tobacco fields and residential development. There is one small commercial area that included an auto body repair shop with numerous stored vehicles on-site, a fuel oil business with service trucks and an office/garage. The fire department is also located within the Zone II and appears to have a UST on-site.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Facilities observed in Connecticut are also included in Table 2. Refer to Appendix B for more information about the land uses in Massachusetts. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### **Section 3: Source Water Protection Conclusions and Recommendations**

#### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone II and watershed contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Land acquisition within the watershed, protecting a total of 77% of the watershed lands.
- Adding gates to discourage unauthorized access to the watershed land, especially the use of All Terrain Vehicles.
- Working cooperatively with local quarries, railroad, and other businesses in the watershed.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone Is and Zone A regularly, and when feasible remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watershed and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.



➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination. Farmers may find BMPs helpful in managing manure, pesticides and fertilizers. Provide information or refer them to the DEP's website

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls of land use, regulations related to watersheds and groundwater protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning bylaws that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The Department's Source Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, each spring DEP posts a new Request for Response for the grant program (RFR). Visit the DEP <http://www.state.ma.us/dep/brp/mf/othergrt.htm> and <http://www.state.ma.us/dep/brp/dws/grants.htm> for information about available funds.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I and Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I ?	<b>YES</b> 01G, 04G <b>NO</b> 02G, 03G	Follow best management practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b> 02G, 03G <b>NO</b> 01G, 04G	Monitor non-water supply activities in Zone I (agricultural areas) and prohibited activities in Zone A, and investigate options for removing these activities.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	<b>YES - Zone II</b> <b>NO - Watershed</b>	Southwick has a bylaw in compliance with 310 CMR 22.21(2). Watershed lands in West Springfield are not protected by a Watershed Protection bylaw. Work with the Planning Board to compare land use controls to see that they meet current requirements of 310 CMR 22.20C. Refer to mass.gov/dep/brp/dws/ for model bylaw/ordinance and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>YES - Zone II in Southwick</b> <b>NO - Watershed</b>	Southwick actively protects the Zone II through bylaws and an active Board of Health. There is no information regarding Suffield's bylaws. Contact Suffield or CT DPH. Work with the communities of Holyoke and Westfield to encourage them to protect watershed lands.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>YES - Surface</b> <b>NO - Wellhead</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . Update Watershed Resource Protection Plan as noted in watershed inspection reports and as appropriate.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment the plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams in Southwick and in Holyoke as appropriate.
Does the municipality have a watershed and wellhead protection committee?	<b>NO</b>	Establish committee and include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Encourage and assist Boards of Health in conducting inspections of commercial and industrial facilities as appropriate.
Does the PWS provide watershed protection education?	<b>YES</b>	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and watershed.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
34340	Rods Customs & Restorations	106b Foster Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
131583	More Parts Of Southwick Inc	40 Sam West Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
50494	Powder Mill Middle School	94 Powder Hill Rd	Southwick	Plant	Air Quality Permit
50583	Western Mass Rendering Co Inc.	94 Foster Rd	Southwick	Generator Of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
211896	Bus Maintenance Garage	Powder Mill Rd	Southwick	Sewer Connection Or Groundwater Discharge	Industrial Waste Water To Sewer
275553	Southwick Tolland Regional High School	93 Feeding Hills Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
280450	B & E Tool Company Inc	10 Hudson Drive	Southwick	Generator Of Hazardous Waste	Small Quantity Generator
275553	Southwick Tolland Regional High School	93 Feeding Hills Rd	Southwick	Plant	Air Quality Permit
281212	Moosehead Harvesting Corp	49 Sam West Rd	Southwick	Generator Of Hazardous Waste	Small Quantity Generator Of Waste Oil Or PCBs
283488	Whalley Precision Inc	28 Hudson Dr	Southwick	Generator Of Hazardous Waste	Small Quantity Generator Of Waste Oil Or PCBs
324974	Thomcast Communications Inc - Comark Div	104 Feeding Hills Road	Southwick	Generator Of Hazardous Waste	Small Quantity Generator

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
MV4135695688	D&S Manufacturing Co	10 Hudson Dr	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
	Erik Shuette	90 Point Grove Rd	Southwick	Generator Of Hazardous Waste	Small Quantity Generator
MAV000011084	Lakeside Motors	96 Point Grove Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MAV000011495	New England Equipment	74 Foster Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MAD985267145	R. E. Humason Inc	56 Sam West Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MV4135695801	Rapid Oil Change	144 Berkshire Ave	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MV4135690988	Rare Auto Inc	11 Sam West Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MAV000010483	Ray's Automotive	49 Sam West Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
MV4135691254	Sheridan's Protech Auto	153 Point Grove Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
339044	Westfield Gage Co	34 Hudson St	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator
378898	Pioneer Dairy Inc	214 Feeding Hills Rd	Southwick	Generator Of Hazardous Waste	Very Small Quantity Generator

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Saunder's Boat Livery Inc.	120 Congamond Rd	Southwick	Boat Livery	1 Wall	Approved In-Tank Monitor	4,000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000536	81 Point Grove Rd	SOUTHWICK	Unlisted
1-0014428	97 Feeding Hills Rd	SOUTHWICK	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.





Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**West Stockbridge Water Department**

### What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<b>PWS Name</b>	West Stockbridge Water Department
<b>PWS Address</b>	9 Main Street, P.O. Box 525
<b>City/Town</b>	West Stockbridge
<b>PWS ID Number</b>	1326000
<b>Local Contact</b>	Mr. Preston Lockenwitz
<b>Phone Number</b>	(413) 232-0309

### Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

**System Susceptibility**

**High**

**Zone II #: 539**

**Susceptibility: High**

Well Names	Source IDs
Swamp Rd. Well #1	1326000-05G
Swamp Rd. Well #2	1326000-06G

The town of West Stockbridge is a small residential community in south Berkshire County, Massachusetts. West Stockbridge, settled in the 1700's, was established as an agrarian town, then developed with marble mining and mills along the waterways. Today the town hosts tourism and seasonal and year round residents. The West Stockbridge Water Department maintains two active water supply wells: Swamp Rd. Well #1 (05G) and Swamp Rd. Well #2 (06G). The Water Department also lists one surface water supply, Sartori Quarry 02S as an emergency source of water. The emergency source will not be addressed further in this report.

Wells #1 and #2 are located approximately 55 feet apart, within the same, relatively narrow, unconfined, sand and gravel aquifer that lies within the flood plain along the Cone Brook valley and are used alternately. Well #1 is a 6 x 12-inch diameter gravel packed well, 51 feet deep, installed in the 1993 to replace the surface water supply that was inadequate. Well #2, a back-up source, is an 8 x 12-inch diameter naturally developed well, approximately 48 feet deep, 55 feet from Well #1. Wells #1 and #2 are located within the same hydrogeologic regime, and therefore share the same Zone II contribution area. Well #1 was pump tested at a rate of approximately 100 gpm and has an approved withdrawal rate of 69.4 gpm (99,936 gpd). Well #2 was also tested at a rate of approximately 100 gpm and has an approved withdrawal rate of 30 gpm. The Town owns the 400-foot Zone I radial area around Well #1. However, the Town could not easily acquire additional land for the 400 foot Zone I radius for Well #2. Therefore, the approved withdrawal rate for Well #2 is limited to 30 gpm (43,200 gpd) by the Town's ownership of Zone I radial area of 345 feet. The Zone II (#539) is within the towns of West Stockbridge and Richmond.

The aquifer is a glacially deepened, bedrock valley that was filled in with sand and gravel deposited during the recession (melting) of the glaciers some 12-18,000 years ago. Streams and rivers have reworked and eroded the glacial deposits and recent streams have deposited additional alluvial material. Boring logs and maps in the Cone Brook valley indicate sand and gravel from ground surface to about 20-feet below grade underlain by a layer of silt and sand. That semi-confining layer of silt and fine sand is underlain by the principal aquifer which consists of channel deposits ranging from fine sand to coarse sand and gravel deposits up to 55 feet in depth. Although boring logs indicate silt and fine sand, there is no evidence of a continuous confining clay layer in the Cone Brook aquifer. Due to the proximity of wells to the Cone Brook, under extended duration pumping conditions it is likely that the Cone Brook contributes water to the aquifer supplying the wells.

The topography of the Zone II watershed is steep sloped valley with the narrow Cone Brook valley widening to the southwest at the confluence of Cone Brook and Furnace Brook at Shaker Pond. West Stockbridge Mountain borders on the southeast and Cone Hill on the northwest. The overburden material on the uplands in the watershed is predominantly a thin cover of glacial till, often referred to as hard pan, with significant areas of exposed bedrock. The brook valley has limited deposits of recent alluvium and swamp deposits underlain by stratified drift. The bedrock beneath the Zone II and Zone III is mapped as the Stockbridge Formation consisting of dolostone and marble. The structural geology of the region is highly complex with several stages of folding, faulting and significant structural movement with the Berkshire Massif to the east and the Taconic range to the west. The watershed is located within an area of faulted, overturned synclines and anticlines.

The Zone II for the wells was delineated as part of the SWAP program through the use of analytical modeling and geologic mapping. Aquifer characteristics were determined from data collected during extended duration pumping tests and borings drilled during groundwater exploration. The Cone Brook aquifer is considered to be highly vulnerable to contamination from land uses on the ground surface due to the absence of a hydrogeologic barrier (i. e. clay) that can prevent contaminant migration from activities on the land surface. Please refer to the attached map to view the boundaries of the Zone II and consult the Consumer Confidence report for current water quality data.

Water from the aquifer has a relatively high hardness and therefore Aqua-Mag phosphate sequestering agent is added to the water from the wells to prevent calcium precipitation in the distribution system. Water is also chlorinated for disinfection prior to distribution. For current information on water quality monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

## Section 2: Land Uses in the Protection Areas

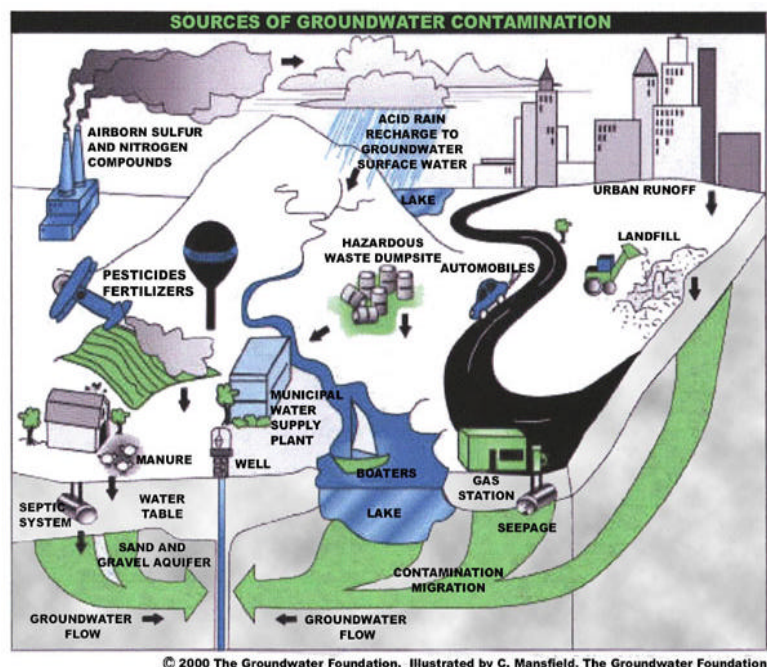
The land use within the Zone II for the Water Department wells is a mixture of forest, cropland, grazing and residential (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Zone I
2. Residential land uses
3. Transportation corridors
4. Agricultural activities
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Zone Is** – The Zone I for Well #1 is a 400 foot radius around the wellhead while the Zone I for Well #2 is 345 feet. Currently, Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction, Memorandum of Understanding or other legal mechanism as approved by the DEP. The public water supplier does own the entire Zone I for both of the wells but the



withdrawal is limited on Well #2 by the size of the Zone I. Only activities directly related to the water supply, or other non-threatening activities, as determined by the DEP, are allowed in the Zone I. The Department encourages ownership or control of the Zone I through various means as outline below.

The wells are located within the floodplain of Cone Brook and adjacent to a pasture for cattle. The Water Department applied for and was awarded a grant to improve the sanitary seals on the wells and observation wells, to construct a berm to protect the wells from flooding and ice damage, and to install a fence to prevent grazing animals from accessing the Zone I. The property immediately adjacent to the Zone I is part of a farm that has heavy equipment and associated petroleum and other products stored within the Zone II and Zone III of the wells. Although the facility is on the opposite side of Cone Brook and not within the Zone I, it is within close proximity to the wells.

#### **Zone I Recommendations:**

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Consider for future expansion, options for purchasing land and/or negotiating a conservation restriction for land adjacent to the existing Zone I.
- ✓ Agreement Options - Until land is available for acquisition or restriction, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
  - A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For example, if the land is residential with a septic system, the owner could agree to not place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. As another example, the portions of fields within the Zone I would not have manure, fertilizers or pesticides spread on them. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.
  - A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available. Please refer to the example of the Right of First Refusal documents attached in the Appendices.

The Department commends the West Stockbridge Water Department for its proactive efforts to acquire property and control activities within the Zone I and recommends continued efforts in establishing a program for planning to acquire ownership or control of additional property within the areas critical to protecting water quality. If there is no other reasonable method to secure rights and protect these sources, the Water Department may wish to consider taking necessary water supply land by

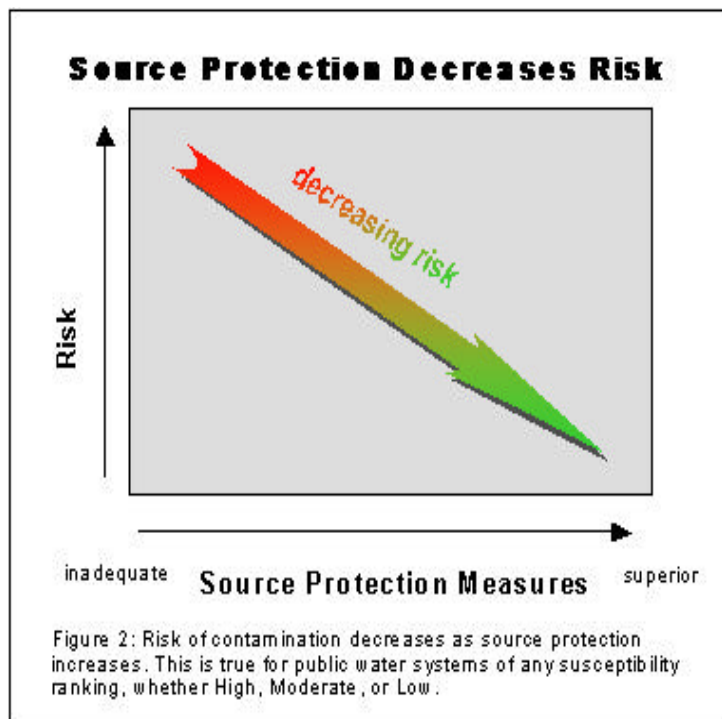
#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

#### **For More Information**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.



## Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Protection Areas**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Areas

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Agriculture</b>			
Fertilizer/Pesticide Storage or Use—Crops	1	H	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
Manure Storage	1	H	Microbial and nutrient contamination to surface and groundwater
Hazardous materials	Few	M	Fuel storage, petroleum products for equipment
<b>Residential</b>			
Fuel Oil Storage (at residences—ASTs/USTs)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Transportation corridors	1	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Pole mounted electrical transformers	1	L	MODF and possibly PCBs: spills, leaks, or improper handling. Contact the electric company to ensure there are no PCBs within the transformers.

### Table 2 Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



eminent domain to protect the sources. This recommendation is not only for the existing sources but also should be considered for future development of sources, if they are needed. We recommend consulting your Solicitor regarding land takings in another community.

**2. Residential Land Uses** – Approximately 20% of the Zone II consists of residential areas. The Zone II areas are not connected to municipal sewer and therefore utilize on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider working with the Fire Chief to inventory fuel sources and storage methods in the Zone II. Provide BMPs to homeowners for fuel oil storage.



**3. Transportation Corridors** - Swamp Road and several other local roads run throughout the Zone II protection area. Roadway construction, stormwater runoff, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are also frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing materials, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins or directly into streams and brooks.

**Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. Where it is practical, recommend water quality swales to slow stormwater flow and settle out sediments before they discharge to surface water.
- ✓ Contact the Town to ensure stormwater systems are inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Continue current efforts of working and planning with local emergency response teams to ensure that any spills within the Zone II can be effectively contained and the Water Department is notified.

**4. Agricultural Activities** – There are a few farms (crop, hay and pasture) throughout the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure piles and field application are potential sources of contamination to ground and surface water supplies. In addition, farms and large commercial facilities often conduct their own maintenance on their equipment and have storage of hazardous materials and waste.



### **Agricultural Activities Recommendation:**

- ✓ If appropriate, work with the DEP to negotiate Conservation Restrictions for these land areas.
- ✓ Work with commercial farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> and call the local office of the NRCS in Pittsfield at 413-443-6867 for assistance.
- ✓ Encourage farmers and property managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning. Request that farmers evaluate their status as hazardous waste generators and register with DEP, as appropriate.

### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

- ✓ Continue your current efforts with farmers to ensure that pesticides, fertilizers and manure are being stored within a structure designed to prevent runoff.

- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>, and call the local office of the NRCS for assistance.

- ✓ Work with hobby farmers by supplying them with information about protecting their own wells, surface waters and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**5. Comprehensive Protection Planning** – Currently, the Towns of West Stockbridge and Richmond do not have water supply protection controls that meet the requirements of the Department's Wellhead Protection regulation 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan can coordinate community and inter-community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

### **Top 5 Reasons to Develop a Local Wellhead Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased groundwater monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://mass.gov/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### **Protection Planning Recommendations:**

- ✓ Consider preparing a Wellhead Protection Plan. Establish a protection team that includes participants from the Town of Richmond, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Request that the West Stockbridge and Richmond Boards of Health adopt floor drain controls and hazardous materials handling regulations and that the Planning Boards propose wellhead protection bylaws for the Zone II.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply. Other land uses and activities within the Zone II are listed in Table 2.

## **Section 3: Source Water Protection Conclusions and Recommendations**

### **Current Land Uses and Source Protection:**

As with many water supply protection areas, the system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Proactively pursuing land acquisition and protection options in the Zone I,
- Maintaining detailed knowledge of activities within the protection areas,
- Efforts to work with land owners to control and manage manure and runoff.

### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and prohibit any non-water supply activities within the Zone I.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Consider inventorying USTs within the Zone IIs.
- ✓ Continue working with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan and continue efforts to include Richmond in source protection efforts.

### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. When funds are available, the Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Each spring, if funds are available, DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the protection area. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

### **A. Protection Recommendations and Additional Documents on Source Protection**

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Continue working with land owners to negotiate a Conservation Restriction or ownership to acquire additional land for protection.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b>	Continue to keep other land uses out of the Zone Is. Continue working with land owners to negotiate a CR, MOU and other forms of protection.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	Work with the community Planning Board and Board of Health to adopt wellhead protection measures.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Richmond does not have wellhead protection measures in place that meet 310 CMR 22.21(2). Continue efforts to encourage neighboring communities to adopt bylaws and regulations to protect resources.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Consider developing a plan and include strategies for future source development and protection. Refer to "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> . Include Richmond officials in the plan development and implementation.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Continue to work with the Fire Department, Board of Health, DPW, and local and state emergency officials.
Does the municipality have a wellhead protection committee?	<b>YES</b>	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>N/A</b>	
Does the PWS provide wellhead protection education?	<b>YES</b>	Aim additional efforts at residential and agricultural uses within the Zone II and as appropriate Zone III.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Mill Pond Trailer Park

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 29, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	Mill Pond Trailer Park
<i><b>PWS Address</b></i>	40 Albany Road
<i><b>City/Town</b></i>	West Stockbridge, Massachusetts
<i><b>PWS ID Number</b></i>	1326001
<i><b>Local Contact</b></i>	Victor Gennari
<i><b>Phone Number</b></i>	(413) 232-7741

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well No. 2	1326001-02G	250	622	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for Mill Pond Trailer Park is located northeast of Albany Road. There is municipal water and wastewater available in West Stockbridge, however only waste water disposal is available to the Mill pond facility. The Well No. 2 is a gravel developed well that was installed to replace a shallow dug well (Well No. 1). The well was installed and tested under the requirements of the New Source Approval Process. The well is within a confined aquifer, where there is a thick clay layer between the ground surface and the well screened in the sand and gravel.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well has a Zone I radius of 250 feet and an Interim Wellhead Protection Area radius of 622 feet based on a approved withdrawal rate. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. There is a hydrogeologic barrier (clay layer) at least in the immediate vicinity of the well. However, unless this hydrogeologic barrier is known to exist throughout the IWPA, the aquifer is considered to have a high vulnerability to contamination. Nonetheless, the hydrogeologic barrier that does exist provides some protection relative to impeding the downward migration of contaminants from areas overlying the barrier. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Non-conforming Zone I;**
2. **Residential Land Uses;**
3. **Railroad Tracks; and,**
4. **Transportation Corridor**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Non-conforming Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities or other non-threatening activities within the Zone I. The Zone I contains driveways, roads, parking spaces, and residences. Systems not meeting DEP Zone I requirements must notify the DEP, receive approval and address Zone I issues prior to increasing water use or modifying systems.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Railroad Tracks	No	Yes	High	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Fuel Storage Above Ground	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Transportation Corridor	Yes	Yes	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Recommendations:

- ✓ Based upon the current location of homes it may not be possible to prohibit vehicle parking within the Zone I; however, Mill Pond Trailer Park should work toward prohibiting/limiting/impeding parking in close proximity to the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway and parking lot drainage in the Zone I away from the well.

**2. Residential Land Uses** – Mill Pond Trailer Park and the surrounding residences are on town sewer. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store. Require that fuel lines are sleeved to protect from leaks.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

## Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Consider a bylaw requiring that replacement heating/hotwater systems not be fueled by fuel oil or kerosene. Encourage maintenance of those tanks that exist and encourage conversion to propane.

**3. Railroad tracks** - Railroad tracks cross the IWPA. Over-application or improper handling of herbicides on the railroad right-of-way is a potential source of contamination. Leaks or spills of transported chemicals or train maintenance chemicals are also potential sources of contamination to the water supply.

## Recommendations:

- ✓ Work with local officials during their review of the railroad right-of-way Yearly Operating Plans to ensure that the portion of right-of-way within the facility IWPA is not sprayed with herbicides.
- ✓ Work with your local fire department to ensure that the IWPA is included in Emergency Response Planning.

**4. Transportation Corridor** - Major roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

## Recommendation:

- ✓ Contact the local fire department to ensure that the IWPA is included in Emergency Response Planning.

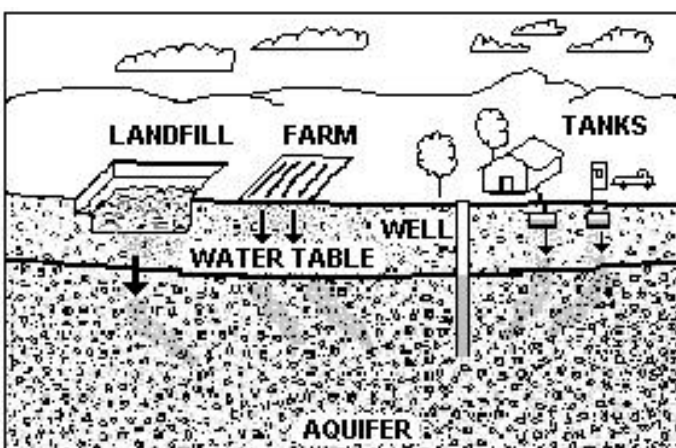


Figure 1: Example of how a well could become contaminated by different land uses and activities.

#### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

#### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Mill Pond Trailer Park is commended for their past efforts to utilize municipal wastewater disposal, replacing the shallow well with a deep well, posting signs in the Zone I, and educating tenants on wellhead protection issues. The facility should continue efforts in water supply protection through reviewing and adopting the key recommendations above and the following:

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

#### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

#### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

#### Planning:

- ✓ Work with local officials in town to include the facility's IWPA in Aquifer Protection District Bylaws if the town establishes such bylaws in the future.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the wells and is treated according to DEP guidance.

#### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the

attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

### 4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Westfield Water Department**

### What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Westfield Water Department
<i><b>PWS Address</b></i>	59 Court Street, City Hall
<i><b>City/Town</b></i>	Westfield, Massachusetts 01085
<i><b>PWS ID Number</b></i>	1329000
<i><b>Local Contact</b></i>	Mr. Charles Darling
<i><b>Phone Number</b></i>	(413) 572-6243

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

**Zone A:** is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

**Zone B:** is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

**Zone C:** is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

### System Susceptibility:

**High**

### Groundwater Sources

MA GIS Zone II ID #: 149

Susceptibility: High

Well Name	Source ID#
GP Well #1	1329000-01G
GP Well #2	1329000-02G
GP Well #7	1329000-07G
GP Well #8	1329000-08G

MA GIS Zone II ID #: 515

Susceptibility: High

Well Name	Source ID#
GP Well #3	1329000-03G
GP Well #4	1329000-04G

MA GIS Zone II ID #: 293

Susceptibility: High

GP Well #5	1329000-05G
GP Well #6	1329000-06G

### Surface Water Sources

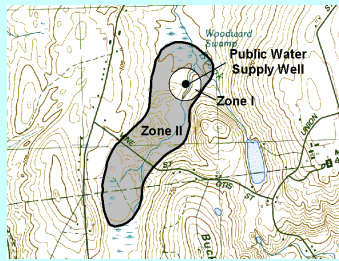
Source Name	Susceptibility: Moderate
Granville Reservoir	2153000-02S

Westfield is a mid-sized, residential and industrial city located in southwestern Massachusetts. Westfield Water Department receives its water from 8 wells and 1 reservoir. Westfield also purchases water from the Springfield Water & Sewer Commission supply. The Springfield system SWAP report will be forwarded to the Westfield water Department once it is completed.

The eight wells serving the Westfield Water Department are located in three different aquifers and therefore have different Zone II, recharge contribution areas. The aquifers utilized by the Westfield Water Department are part of a series of prolific, buried bedrock valley aquifer systems trending north-south. Portions of the aquifer flow north discharging into the Connecticut and Westfield River and some portions flow south discharging to the Westfield River. The aquifers were formed when bedrock valleys were filled with sand and gravel during the recession, (melting) of the glaciers approximately 14,000 years ago. The aquifer area north of the Westfield River is known as the Barnes Aquifer and the Broad Brook Basin of the Barnes Aquifer has been designated by EPA as a Sole Source Aquifer. Groundwater from the aquifer tapped by wells 01G, 02G, 07G, and 08G, flows south to the Westfield River while groundwater from the aquifer tapped by wells 03G and 04G, flows north to the Westfield River. There is no evidence of a protective clay

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



layer above the aquifer utilized by Westfield's wells. Wells located in this type of aquifer are considered to be highly vulnerable to contamination due to the absence of hydrogeologic barriers (i.e. confining clay layer) that can prevent contaminant migration from activities on the land surface. In fact, parts of the aquifer utilized by well #3 and #4 have been contaminated with compounds used as a fumigant on agricultural fields in the past. Drinking water supplies may be treated to remove contaminants prior to distribution. The bedrock beneath the sand and gravel aquifer is mapped as Triassic arkose, sandstone and siltstone.

Zone II #149 for wells 01G, 02G, 07G, and 08G extends from Westfield into Holyoke and Southampton in the sand and gravel aquifer and is part of the Barnes Aquifer. The Zone II #515 for inactive wells 03G and 04G extends from Westfield into the town of Southwick. This aquifer is also utilized as a public water supply for West Springfield and Southwick. Parts of this aquifer have been contaminated with ethyl dibromide (EDB) a soil fumigant and gasoline additive used until the 1980s. West Springfield currently treats the water from their wells while Southwick's wells are not impacted by the contamination in the aquifer. Westfield is required to treat the water prior to reactivating wells 03G and 04G. DEP has approved plans submitted by the Westfield Water Department to install granular activated carbon (GAC) units to remove the EDB and chlorinate the water prior to distribution.

Inactive Wells 05G and 06G are located in a small, unconfined sand and gravel aquifer near the municipal boundary with Russell. The Zone II (#293) for wells 05G and 06G, is largely within Westfield, with a small portion of the aquifer extending into the town of Russell. Well 06G has a Zone I protective radius of 400 feet while Well 05G has a Zone I radius of 300 feet. Please refer to the attached map of the Zone II.

The watershed for the Granville Reservoir lies almost entirely within the Town of Granville. The majority of the watershed is located in the steep sloped highlands west of the reservoir on a bedrock geologic formation known as the North Granby Dome. The bedrock includes the Collinsville Formation, a sequence of schist, granitic gneiss, amphibolites and coticles, the Straits Schist and the Hartland Formation composed of various types of schist. The

bedrock is primarily covered with a relatively thin layer of glacial till. Stratified drift (sand and gravel) deposits are mapped immediately surrounding the reservoir to the north, west and south and are associated with stagnant ice flows in the Dickinson-Holliston Brook area. Please refer to the attached map for an outline of the reservoir watershed.

The water from wells 01G, 02G, and 07G are pH adjusted for corrosion control. The water from the Granville Reservoir is filtered, disinfected, and treated for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

## Section 2: Land Uses in the Protection Areas

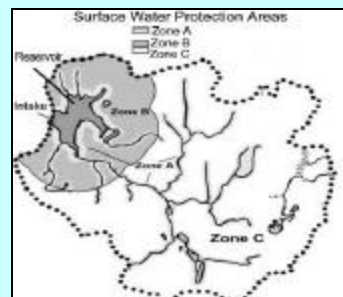
The land uses within the Zone II and watershed protection area for Westfield's water supplies are a mixture of forest, residential, commercial and agricultural land uses with some small areas of industrial use (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Activities in Zone I

### What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.





2. Activities in Zone A
3. Residential Land Uses
4. Transportation Corridors
5. Hazardous Materials Storage and Use
6. Agricultural activities and Golf Course
7. Confirmed Oil or Hazardous Material Contamination Sites
8. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

**1. Activities in Zone I** – The Zone I for each of the wells, except well #5, is a 400 foot radius around the wellhead. The Zone I radius for well #5 is 300 feet. Massachusetts drinking water regulation (310 CMR 22.00 Drinking Water)

requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Westfield owns or controls the Zone I for wells 01G, 03G, 04G, 05G, 06G, 07G and 08G. Westfield does not own or control the Zone I for well 02G. Regulation limits activities in the Zone I to only those related to water supply. However, many public water supplies were developed prior to promulgation of the Department's regulation and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

**Well 02G** - Two homes with on-site septic systems and two local roads are within the Zone I for Well 02G.

**Well 07G** - There is a mowed grassy area within the Zone I for Well 07G that acts as a buffer around Runway 33 for the City airport. There is also heavy illegal traffic around the wells resulting in vandalism of monitoring wells and the protective fencing.

**Well 08G** - A large beaver pond periodically has been flooded adjacent to the wellhead within the Zone I.

#### **Zone I Recommendations:**

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road deicing within the Zone I.
- ✓ Prohibit any new non-water supply activities from Zone I.



Figure 1: Sample watershed with examples of potential sources of contamination

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

- ✓ Increase patrols, educate the local population regarding the no trespassing policy and enforce no trespassing requirement. Anecdotally, other communities have had success in aggressively patrolling water supply areas, ticketing trespassers, pursuing violators and impounding vehicles used illegally on protected land.
- ✓ Monitor the extent of the beaver pond and take appropriate action to protect the wellhead from flooding.
- ✓ Consider a Memorandum of Understanding or a Right of First Refusal for Zone I land not currently owned or controlled. These legal agreements can secure the land uses for the future.

**2. Activities in Zone A** - A Zone A for a reservoir includes the area within 400 feet of the reservoir shore line and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. Because the Zone A is the area closest to



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II Number	Reservoir Watershed	Potential Contaminant Sources*
<b>Agricultural</b>					
Fertilizer Storage or Use	Numerous	M	515, 149	-	Leaks, spills, improper handling, or over-application of fertilizers
Livestock	Several	M	All	-	Manure, pesticides
Forestry Operation	1	M	515	-	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Pesticide Storage or Use	Numerous	H	515, 149	-	Leaks, spills, improper handling, or over-application of pesticides
<b>Commercial</b>					
Auto Repair/body Shops	9	H	149	-	Spills, leaks, or improper handling of automotive fluids, and solvents
Golf Courses	1	M	149	-	Over-application or improper handling of fertilizers or pesticides
Airport	1	H	149	-	Spills, leaks, or improper handling of petroleum fluids, and solvents, deicers
Junk Yards and Salvage Yards	1	H	149	-	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Landfill (closed)	1	H	149	-	There is an uninvestigated landfill at the east end of the runway. The other landfill on the west end of the runway has been removed. Leachate.
Medical Facilities	1	M	149	-	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Railroad Tracks and Yards	1	H	149	-	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Sand & Gravel	2	M	149, 515	-	Spills, leaks, or improper handling of petroleum fluids, and solvents
<b>Industrial</b>					
Food Processors	1	L	515	-	Cleaners, other chemicals, microbial contaminants: spills, leaks, or improper handling or storage
Industry/Industrial Parks	2	H	149, 515	-	Industrial chemicals and metals: spills, leaks, or improper handling or storage

Land Uses	Quantity	Threat*	Zone II Number	Reservoir Watershed	Potential Contaminant Sources*
Machine/ Metalworking Shops	6	H	149, 515	-	Solvents and metal tailings: spills, leaks, or improper handling
<b>Residential</b>					
Fuel Oil Storage (at residences)	Numerous	M	All	Yes	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Yes	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Yes	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>					
Aquatic Wildlife	Numerous	H	-	Yes	Microbial contaminants
Clandestine Dumping	Few	H	149, 515	-	Improper use or storage of fuels and other chemicals
Schools	3	M	515	-	Laboratories, cleaning, automotive
Oil or Hazardous Material Sites	2	--	515	-	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Maintenance De- pot	1	M	515	-	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way: <u>Electric</u>	4	H/L	149, 515	Yes	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	Numerous	H/M	All	Yes	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	Numerous	H	149	-	Spills, leaks, or improper handling or storage of hazardous materials and waste
Aboveground Storage Tanks	Numerous	M	149, 515	-	Spills, leaks, or improper handling or storage of hazardous materials and waste

**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

the reservoir and its tributaries, land uses within the Zone A are of particular concern. Therefore, certain activities that could potentially threaten water quality if improperly managed are restricted by 310 CMR 22.20B. Activities that store, use, or dispose of hazardous materials can be potential sources of contamination if improperly managed. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following activities occur in the Zone A of the system's reservoir:

**Granville Reservoir (01S)** - There is a local road and two or three private homes, that utilize onsite septic systems, in the Zone A of the reservoir. There is also evidence of extensive access by off road vehicles on both legal and illegal trails throughout the watershed, most notably near the reservoir.

#### **Zone A Recommendations:**

- ✓ To the extent possible, remove all prohibited activities from the Zone A to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.
- ✓ Increase patrols and enforce no trespassing requirement.
- ✓ Consider a Memorandum of Understanding or a Right of First Refusal for Zone A land not currently owned or controlled. These legal agreements can secure the land uses for the future.

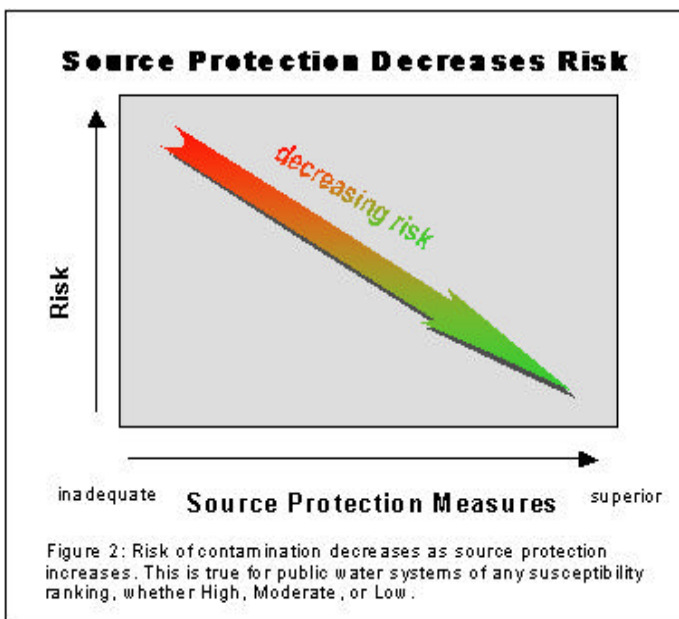
**3. Residential Land Uses** – The Granville Reservoir watershed is predominantly wooded with the City owning 82% of the watershed. Approximately 14% of the combined Zone IIs and watershed consists of residential areas; only 1% of the watershed has residential development. The few residences in the watershed use septic systems while some of the areas in the Zone IIs have public sewers, and

some use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not

#### **Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

**Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Continue working with City planners to control new and existing land uses and residential developments in the water supply protection areas.

**4. Transportation Corridors** - There are several local roads located throughout the watershed of the reservoir, including many dirt roads; there are numerous roads throughout the Zone IIs. Though most roadways in the reservoir watershed are low-use, even typical roadway maintenance and use pose a potentially significant source of contamination from accidents and washouts along the dirt road. Larger, heavily traveled roads pose a greater threat. De-icing materials, petroleum chemicals and other debris on roads are picked up by stormwater washed and discharge into the reservoirs. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the reservoirs. Additionally, illegal dumping is evident along some of the roads accessible by street vehicles. Clandestine dumping is a significant threat to the water supplies. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

There are numerous unpaved ways as well as legal (authorized) and illegal (unauthorized) trails throughout the watershed. Most of these roads and trails are not maintained at all or are minimally maintained. The resulting erosion poses a significant threat to water quality in areas that are proximal to feeder streams and the reservoir, potentially resulting in additional water treatment costs if it continues unchecked. Uncontrolled erosion contributes sediment, various contaminants and pathogens into the contributing waters and reservoirs. Access to the reservoir was observed and anecdotal information indicates evidence of

camping near the reservoir and throughout the watershed. Unmanaged access may result in vandalism, illegal dumping and access to the reservoir resulting in water quality impairment.

The Water Department has retained a consultant to prepare a watershed management plan to address stormwater management and erosion control on City property and throughout the watershed. The plan is to prepare an inventory of the existing conditions within the watershed, and determine numerous areas of uncontrolled access and erosion problems and propose BMPs.

Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

Railroad tracks run directly through one of the Zone IIs. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

There is also an airport within one of the Zone IIs. The airport has military, commercial and industrial activities as well as a working airport. The same threats associated with other transportation, commercial and industrial uses apply to the airport. Airports pose additional threats from large quantities of fuel stored on site, oil water separators and stormwater runoff.

**Transportation Corridor Recommendations:**

- ✓ Regularly inspect the watershed and Zone IIs for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the municipality or State to have catch basins inspected, maintained, and cleaned on a regular schedule.

**What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Regular street sweeping reduces the amount of potential contaminants in runoff. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.

- ✓ Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.
- ✓ Notify host community officials of potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ex.4. Review the fact sheet available on line and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Investigate disposition of all roads, ways and "trails".
- ✓ Increase patrols of watershed land and enforce no trespassing.
- ✓ Evaluate all options for management of access to ways. Include evaluation of continuing the current practice of full access, closing roads to all traffic, closing road to all commercial traffic and limiting access only to residents with a locked gate and key for residents only.
- ✓ Evaluate existing conditions throughout the watershed with respect to current illegal use of watershed land. Determine where access is being gained and what are the destination points. Develop a strategy and

management plan to eliminate or control access. Coordinate with the host communities for management strategies.

**5. Hazardous Materials Storage and Use** – Approximately 10 % of the Zone II for Westfield's wells is commercial or industrial land uses. Many areas presently are not served by municipal sewers. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground. There may be businesses within the water supply protection areas that are not aware that they should be registered as hazardous waste generators. Very often businesses that generate very small quantities of hazardous waste are not aware of the regulatory requirement.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- ✓ Work with local Boards of Health and businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.
- ✓ If it is needed, funding may be available for the school and bus terminal located in Southwick. The USDA has

**Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

**For More Information**

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and the town boards.

various funding sources for government, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. Additional information is available on the web site [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call Paul D. Geoffroy, Rural Development Manager at the local office in Hadley at 413-585-1000 ex.4.

**6. Agricultural Activities and Golf Course** – The Zone IIs for the wells include agricultural land uses and golf courses. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Very often farms and golf courses also store and use hazardous materials and generate hazardous waste through use and maintenance of equipment.

**Agricultural Activities and Golf Course Recommendations:**

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Review the fact sheet available online and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage the farmers and golf course managers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.
- ✓ Promote Best Management Practices (BMPs) for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with farmers, nurseries, and golf courses to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf>. This may be appropriate for host communities.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

**7. Confirmed Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 1-0000288, 1-0014428, 1-0000536 and 1-0012886. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites. Contact the Bureau of Waste Site Cleanup for more information on these sites.

**8. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, Westfield and Southwick do have water supply protection controls that meet DEP's Wellhead Protection regulation 310 CMR 22.21(2) and Surface Water Protection regulation 310 CMR 22.20 (b) and (c). Wellhead Protection and Surface Water Supply Protection Plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. Westfield does have a Surface Water Supply Protection Plan but does not have a Wellhead Protection Plan. Westfield is an active member of the Barnes Aquifer Protection Committee (BAPC) that coordinates efforts for water supply protection among the communities of Southampton, Westfield and Easthampton served by and overlying the aquifer. The BAPC is facilitated through the regional planning agency.

There are also many private wells for commercial and residential uses located within the aquifer protection areas. The State has guidance for development of local controls to manage private wells and educate owners regarding protection of water supplies. The DEP Drinking Water Program staff can assist communities in development and adoption of local controls.



**Protection Planning Recommendations:**

- ✓ Consider formalizing some of the efforts started in BAPC through the development of a Wellhead Protection Plan and include the area of the Southwick wells. Establish a protection team with Southwick and refer to current measures used by BAPC and the website <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan."
- ✓ If local controls in all communities that serve as hosts to Westfield's water supplies do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2) in all water supply protection planning.
- ✓ Work with City and Town boards to review and provide recommendations on proposed development within your water supply protection areas. Although there is only 18% of the watershed not owned by the City, work with the town of Granville to review information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/> and their planning efforts.
- ✓ Refer to the DEP website <http://www.state.ma.us/dep/brp/dws/privwell.htm> for private well guidelines and model regulations. The Department recommends methods for cataloguing existing wells and educating private well owners regarding supply protection.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

**Section 3: Source Water Protection Conclusions and Recommendations****Current Land Uses and Source Protection:**

As with many water supply protection areas, the system Zone IIs and watershed contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Aggressive land acquisition within the watershed for source protection,
- Pursuing the installation of sanitary sewers in existing residential areas within the City,
- Education about drinking water and source protection to elementary schools and the public,
- Extensive efforts to protect the Zone IIs through ordinances and active monitoring of hazardous waste generators and storage tanks (along with their removal) within the Zone II,
- Active involvement in review and comment on development plans within protection areas.

**Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Inspect the Zone Is and A regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone IIs and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

**Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships among businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is local planning, including adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health regulations, discharge prohibitions, general ordinances, and zoning by-laws/ordinances that prohibit or control potential sources of contamination within the protection areas.

➤ **Other Funding Sources:**

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. The USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online and call the local office (Amherst 413-253-4350) of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: if funds are available, each spring DEP posts a new Request for Response for the grant program (RFR).

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I and Zone A</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	<b>YES</b> 01G, 03G, 04G, 05G, 06G, 07G and 08G	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
	<b>NO</b> 02G, 02S	To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone A requirements. City owns 82% of the watershed.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>NO</b> 02G, 07G and 08G	Monitor non-water supply activities in Zone I (the electrical transmission line in the Zone I of 05G) and prohibited activities in Zone A, and investigate options for removing these activities. Plan to replace diesel drive generator at 01G with a propane generator.
<b>Municipal Controls</b> (Zoning Bylaws/Ordinances, Health Regulations, and General Bylaws/Ordinances)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	<b>NO</b>	Continue working with the Planning Boards to compare land use controls to see that they meet current requirements of 310 CMR 22.21(2) and 310 CMR 22.20C. Refer to <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model by-laws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>YES</b>	Work with the community of Southwick to assist and encourage them in the active protection of the Zone II lands.
<b>Planning</b>		
Does the PWS have a local surface water and wellhead protection plan?	<b>YES</b> - Surface <b>NO</b> - Well-head	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	<b>NO</b>	Develop a committee to include representatives from citizens' groups, neighboring communities, and the business community. Include the town of Southwick.
Do the Boards of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	Floor drain regulations are proposed. Conduct inspections in conjunction with DEP. For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a> . Work with your host communities for consistent management of hazardous materials.
Does the PWS provide watershed protection education?	<b>YES</b>	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs and watershed. Work with Southwick in this effort.

## APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
34340	Rods Customs & Restorations	106b Foster Rd	Southwick	Generator of Hazardous Waste	Very Small Quantity Generator
131583	More Parts Of Southwick Inc	40 Sam West Rd	Southwick	Generator of Hazardous Waste	Very Small Quantity Generator
50494	Powder Mill Mid School	94 Powder Hill Rd	Southwick	Plant	Air Quality Permit
50583	Western Mass Rendering Co Inc	94 Foster Rd	Southwick	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
211896	Bus Maintenance Garage	Powder Mill Rd	Southwick	Sewer Connection or Groundwater Discharge	Industrial Waste Water to Sewer
280450	B & E Tool Company Inc	10 Hudson Drive	Southwick	Generator of Hazardous Waste	Small Quantity Generator
275553	Southwick Tolland Regional High School	93 Feeding Hills Rd	Southwick	Plant/ Generator of Hazardous Waste	Air Quality Permit/ Very Small Quantity Generator
281212	Moosehead Harvesting Corp	49 Sam West Rd	Southwick	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
283488	Whalley Precision Inc	28 Hudson Dr	Southwick	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
324974	Thomcast Communications Inc - Comark Div	104 Feeding Hills Road	Southwick	Generator of Hazardous Waste	Small Quantity Generator
	Al's Tire	918 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Ames	1111 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
	Air Flyte Inc	32 Airport Dr	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Barnes USAF: 104th Ang	175 Falcon Dr	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Berkshire Industries	109 Apremont Way	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Brookside Automotive	233 Union St	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Charis Air Corp	110 Airport Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Cloot's Auto Body	825 North Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Dennis Fire Protection	29 Char Dr	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Industrial Precision	1014 Southampton Rd	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Westfield Grinding Wheel	135 Apremont Way	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Whip City Auto Service	919 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Yellow Freight	Falcon Dr	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Hyder's Safety Service Inc	979 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Instrument Technology	33 Airport Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Northeastern Avionics	Barnes Airport	Westfield	Generator of Hazardous Waste	Small Quantity Generator

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
	J. Dirats Co	41 Airport Rd	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Jarvis Surgical Inc	53 Airport Rd	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Jason's Auto Restoration	988c Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	KADMachine	121 Summit Lock Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	L & B Freightliner	910 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Mass Dem Hampden Ponds	North Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	McNairn Packaging	6 Elise St	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Monarch Company, Inc	34 Elise St	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	J & R Air	56 Airport Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Charm Auto Sales	962 Southampton Rd	Westfield	Generator of Hazardous Waste	Very Small Quantity Generator
	Oil Recovery Corp	415 North Rd	Westfield	Generator of Hazardous Waste	Small Quantity Generator
	Westfield Sand & Gravel	143 Papermill Rd	Westfield	Generator of Hazardous Waste	Small Quantity Generator

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



## Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Saunder's Boat Livery Inc.	120 Congamond Rd	Southwick	Boat Livery	1 Wall	Approved In-Tank Monitor	4000	Gasoline
Yellow Freight System Inc (Sms)	160 Falcon Dr	Westfield	Trucking Co.	1 Wall	Approved In-Tank Monitor	10,000	Diesel
		Westfield		1 Wall	Approved In-Tank Monitor	5,000	Diesel
Barnes-Westfield Aviation Corpora		Westfield	South Hangar			2,000	Other
City Of Westfield	Airport Road	Westfield	Airport			1,000	Wast H2o
		Westfield				2,000	Gasoline
		Westfield		Aboveground (AST)		2,000	Diesel
	798 Apremont Way	Westfield					
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
1458 East Mountain Road	East Mtn. Cc	Westfield		AST		500	Gasoline
1458 East Mountain Road	East Mtn. Cc	Westfield		AST		330	Diesel

East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
East Mountain Road	Residential	Westfield				1,000	Htg. Oil
Servistar Ind. Way	Advocate Servicer, Inc.	Westfield		AST		10,000	Diesel
Servistar Ind. Way	Servistar Corporation	Westfield		Unpro. Steel		10,000	Htg Oil
Servistar Ind. Way	Servistar Corporation	Westfield		Unpro. Steel		10,000	Htg Oil
Southampton Road	Lavoie/Kober	Westfield		Steel		1,000	Htg Oil
Southampton Road	MAS	Westfield				1,000	Htg Oil
919 Southampton Road	Southampton Road Trust	Westfield				500	Htg Oil
Southampton Road	Industrial Precision	Westfield				2,000	Htg Oil
1111 Southampton Road	Westfield Development	Westfield		Double Wall		10,000	Htg Oil#4
1111 Southampton Road	Westfield Development	Westfield		Double Wall		10,000	Htg Oil#4
Buck Pond Road	Residential	Westfield				1,000	Htg Oil
Falcon Dr	104 FW Group	Westfield				4,000	
		Westfield				1,000	

		Westfield				2,500	
Holyoke Road	Residential	Westfield				1,000	Htg Oil
Holyoke Road	Residential	Westfield				1,000	Htg Oil
Holyoke Road	Residential	Westfield				2,000	Htg Oil
Long Pond Road	Residential	Westfield				500	Htg. Oil
856 North Road	Danielle's Pizza	Westfield				1,000	Htg Oil
975 North Road	Pezzini-House	Westfield				1,000	Htg Oil
North Road	Hampden Ponds	Westfield				1,000	Htg Oil
Northwest Road	Residential	Westfield				1,000	Htg Oil
Northwest Road	Residential	Westfield				1,000	Htg Oil
Northwest Road	Residential	Westfield				500	Htg Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm> or the Westfield Fire Chief for information about tanks in Westfield.

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000288	Barnes MAB Buck Ponds Rd	Westfield	Unlisted
1-0012886	918 Southampton Rd	Westfield	Oil
1-0014428	97 Feeding Hills Road	Southwick	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For White Oak School

## What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
November 25, 2003

**Table 1: Public Water System (PWS) Information**

<i><b>PWS Name</b></i>	White Oak School
<i><b>PWS Address</b></i>	40 Albany Road
<i><b>City/Town</b></i>	Westfield, Massachusetts
<i><b>PWS ID Number</b></i>	1329004
<i><b>Local Contact</b></i>	Mr. David Drake
<i><b>Phone Number</b></i>	(413) 562-9500

<i><b>Well Name</b></i>	<i><b>Source ID#</b></i>	<i><b>Zone I (in feet)</b></i>	<i><b>IWPA (in feet)</b></i>	<i><b>Source Susceptibility</b></i>
Well #1	1329004-01G	177	472	Low

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

White Oak School is a private elementary school, serving students with special needs, located in Westfield, a medium sized City in western Massachusetts. There is municipal water and wastewater disposal available in Westfield, however only wastewater disposal is available to the White Oak School. A single well serves the school. The well was installed and tested under the requirements of the DEP New Source Approval Process in 1997.

Well #1 is a 6-inch diameter 411 feet deep, bedrock well that is located in the schoolyard, approximately 450 feet south of the school. Geologic mapping in the area indicates thin

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

till cover over bedrock. The bedrock is mapped as sandstones of the Mesozoic Basin. Well logs reports confirm bedrock was encountered at 35 feet below grade and the bedrock encountered was sandstone. Water quality during development indicated dissolved inorganic compounds, in the water. Sodium, chloride and fluoride were reported at concentration near or above the guideline or secondary standard for those constituents. There are no enforceable standards for these constituents. The school monitors the levels and reports the current concentrations as required. For current information on monitoring result

The Zone I is the protected area immediately surrounding the well, while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 177 feet and 472 feet, respectively, based on an approved withdrawal rate of 3,240 gpm. There is no evidence of a hydrogeologic barrier (till or clay layer) to impede the downward migration of contaminants from land uses at the ground surface, therefore the aquifer is considered to have a high vulnerability to contamination. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to frequently monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available at [http://www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html), the EPA's Envirofacts website.

## 2. Discussion of Land Uses in the Protection Areas

There are few uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

#### 1. Passive recreational activity

The overall ranking of susceptibility to contamination for the well is low, based on the presence of only one low threat land use or activity in the Zone I and IWPA, as seen in Table 2. However, the DEP notes that there is inconclusive information regarding the source of the high sodium and chloride in the school well water with respect to whether or not the elevated levels are natural or due to anthropogenic activities. Shallow bedrock makes the bedrock aquifer vulnerable to activities on the surface. In addition, since the actual recharge area for the well has not been determined, the IWPA is only a guide for reviewing activities that may pose a potential threat to the water quality.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Passive recreation	Yes	Yes	Low	Continue current practice of not using pesticides and fertilizers. Inspect the wellhead regularly to ensure the integrity of the cap and seal and that there is no pooling of water.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

There may be activities outside of the IWPA that pose a threat to the water supply. An example may be the salvage/storage yard south of the school or nearby manufacturing facilities. However, there is presently little information to determine the actual recharge area for the well or that any of these facilities may impact the well.

1. **Passive recreational activity** – Passive recreation is the only activity within the protection areas. Potential threats from this activity is related to access and pesticide and fertilizer use.

### Recommendations:

- ✓ Continue current practice of not using fertilizers and pesticides.
- ✓ Inspect the well casing regularly to ensure the integrity of the seal and cap and to ensure there is no ponding of water near the well.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. White Oak School is commended for efforts to utilize municipal wastewater disposal and development of a deep well away from activities. We recommend continued monitoring of the water quality and assessment of appropriate treatment if it becomes necessary to reduce the levels of inorganic constituents in the water. The facility should continue efforts in water supply protection through reviewing and adopting the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

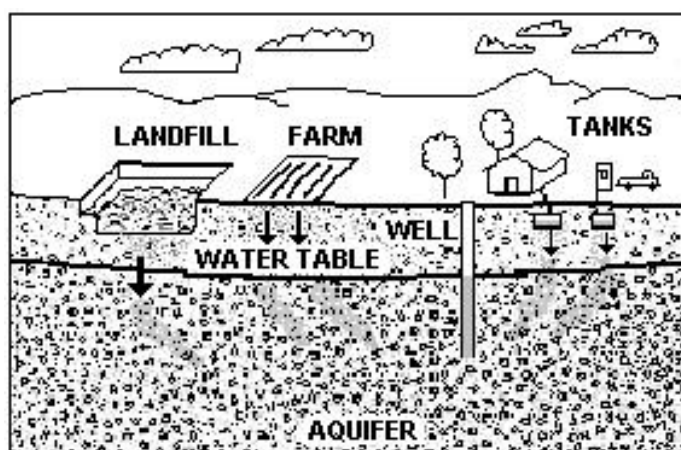


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

### Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility properties.

### Planning:

- ✓ Work with local officials in town to include the facility's IWPA in Aquifer Protection District Bylaws if the town establishes such bylaws in the future.
- ✓ Have a plan to address short-term water shortages and

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and city boards.

long-term water demands. Keep the phone number of a bottled water company readily available.

- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and the facility and treated according to DEP guidance.
- ✓ Review water quality at the school regularly to determine if treated is required.
- ✓ Continue to monitor activities near the school that may impact the water quality.

### Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Each program year, if funds are available, the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation". Documents are available at the DEP website: <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Dion Label Printing, Inc.

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department  
of Environmental  
Protection, Bureau of  
Resource Protection,  
Drinking Water Program

Date Prepared:  
December 4, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Dion Label Printing, Inc.</b>
<i>PWS Address</i>	<b>539 North Road</b>
<i>City/Town</i>	<b>Westfield, Massachusetts</b>
<i>PWS ID Number</i>	<b>1329005</b>
<i>Local Contact</i>	<b>Mr. John Sullivan</b>
<i>Phone Number</i>	<b>413-238-5344</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1329005-01G	100	413	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Dion Label Printing, Inc. is located in Westfield, a medium sized city in southwestern Massachusetts. Dion Label Printing, Inc. is a flexographic printing company specializing in pressure sensitive labels, tags and tickets and associated printers. The total staff is approximately 40 people per day and has recently undergone an expansion of their business. Although the city of Westfield has public water and municipal wastewater sewers, only the sewer serves this area of the City and therefore water is supplied by a single potable supply well (01G) located north of the building. The

## What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

facility is a registered small quantity generator of hazardous waste for printing chemicals, a very small quantity generator of waste oil and is registered through the Environmental Results Program for printers. During the assessment, the facility appeared to use very good hazardous materials handling practices and BMPs. There were no violations noted in the most recent inspection by the DEP Bureau of Waste Prevention.

The Zone I is the protected area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual (Zone II) recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for this facility's well are 100 feet and 413 feet, respectively, based on estimated water use of approximately 600 gallons per day. This volume was based on the estimated use at the time the facility was registered as a public water system. In 2001, a meter was installed to record actual usage. Based on two years worth of metered data, the Department may review and revise the Zone I and IWPA based on actual data. It is likely that the Zone I and IWPA will be revised slightly based on a review of the current data, which shows monthly usage ranging from approximately 1,000 to 1,500 gallons per day.

The overburden in the area is mapped as a thin covering of glacial till over bedrock. There are no records of the construction of the well so that depth to bedrock cannot be confirmed, however, well logs from an abutting facility indicates approximately 35 feet of casing, seated in sound bedrock. The bedrock is mapped as New Haven arkose.

There is no evidence of a protective barrier of either thick till or of a confining, protective clay layer in the vicinity of the well. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Please refer to the attached map of the Zone I and IWPA.

For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

**Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	--	--	--	Contact DEP prior to increasing use or conducting additional activities in Zone I
Hazardous materials storage and use	Yes	Yes	High	Continue the use of BMPs and coordinate with emergency responders.
SQG (Hazardous Waste)/VSQG (Waste oil)	Yes	Yes	Moderate /Low	Hazardous materials
Machine shop	-	-	High	This facility is just outside the current IWPA. Solvents and metal tailings: spills, leaks, or improper handling
School	No	Yes	Moderate	Household hazardous waste, laboratory materials, fuel, parking: spills, leaks, or improper handling or storage

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/den/brn/dws/](http://www.state.ma.us/den/brn/dws/).

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential land use	No	Yes	Moderate	Limit road deicing materials and monitor drainage upgradient of the well
Transportation corridors/parking	Yes	Yes	Moderate	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Printer/photo processor	Yes	Yes	Moderate /High	Printing inks and chemicals: spills, leaks, or improper handling or storage
Transformer (ground mounted)	Yes	Yes	Low	Although most transformers today do not contain PCBs, the oils may pose a threat due to the proximity to the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## 2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #1 includes the entire facility, North Road, residential homes, an elementary school; a machine shop is located just outside of the IWPA. Municipal sewer serves the entire area.

### Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential land uses,**
3. **Transportation corridors, and**
4. **Hazardous materials storage and use.**

The overall ranking of susceptibility to contamination for Dion's water system is high, based on the presence of several moderate and two high threat ranked land uses or activity in the Zone I and IWPA. However, Dion is commended for their diligent management of hazardous materials on-site. Please refer to Table 2 for more details.

**1. Non-conforming activities within Zone I** – Currently, the water supplier does own the entire Zone I area however, the activities conducted within the Zone I are non-conforming and pose a potential threat to the water supply. Systems not meeting DEP Zone I requirements for ownership or control or have non-conforming uses in the Zone I, must get DEP approval and address Zone I activities prior to increasing water use or modifying facilities. The well is located immediately adjacent to the building. The facility is connected to the municipal sewer but there is hazardous materials storage, parking and a printing company (Dion) within the Zone I. The well is inaccessible and had a sanitary cap at the time of the inspection.

### Recommendations:

- ✓ Consider relocation of the well if potential threats cannot be mitigated and water quality is impacted by current activities.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- ✓ Where it is feasible, remove all hazardous materials from the Zone I. Continue current good housekeeping practices and the use of BMPs for the storage, use, and disposal of hazardous materials.
- ✓ Carefully monitor the delivery, handling and storage of chemicals and products.
- ✓ Inspect the well casing and cap regularly to ensure it is sanitary and watertight.

**2. Residential Land Uses** – The IWPA has medium-density residential land use. If managed improperly, activities associated with residential areas can contribute to

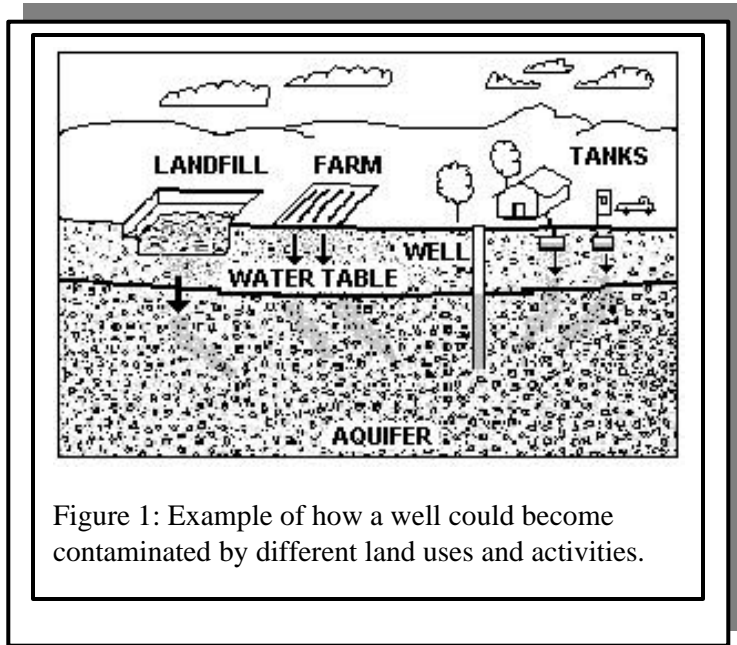


Figure 1: Example of how a well could become contaminated by different land uses and activities.

drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

#### Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and online at the MA DEP website - [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.

**3. Transportation corridor/parking** – North Road is located within the IWPA and the access and parking areas for the facility are within Zone I and the IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

#### Transportation Recommendations:

- V Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they are aware of the location of your well.

**4. Hazardous Materials Storage and Use** – Dion utilizes hazardous materials and generates hazardous waste. There were no floor drains observed during the assessment and it appears that hazardous materials are handled appropriately. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

#### Hazardous Materials Storage and Use Recommendations:

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Review and consider adopting the key recommendations above and the following:

#### Priority Recommendations:

- V Consider relocation of the well if potential threats cannot be mitigated and water quality is impacted.
- V Inventory activities in the IWPA and catalog any new potential threats identified.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:  
[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

- ✓ Continue current good hazardous materials management.

### Zone I:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Inspect and ensure road and parking area drainage in the Zone I continues to be directed away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Continue training staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.

### Planning:

- ✓ Work with local officials in Westfield to review the Aquifer Protection District ordinance for compliance with 310 CMR 22.000 and to include Dion's IWPA in that district.
- ✓ Have a plan to address short-term water shortages and long-term water demands.
- ✓ Keep the phone number of a bottled water company readily available in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Businesses and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## 4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheets

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
KOSINSKI FARM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Kosinski Farm
<i>PWS Address</i>	420 Russellville Rd
<i>City/Town</i>	Westfield, Massachusetts
<i>PWS ID Number</i>	1329006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1329006-01G	100	406	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

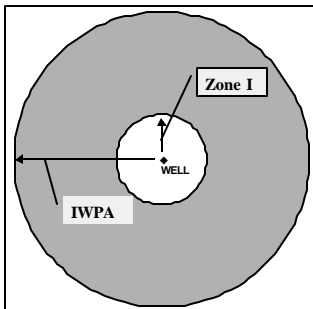
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1329006-01G)**

Zone I = 100 ft.  
IWPA = 406 ft.



### How was My Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I or IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage and use of hazardous materials and agricultural uses within the Zone I and IWPA. Other moderate threat activities within the Zone I and the IWPA are local roads and parking.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report for Westhampton Elementary School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
June 15, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	Westhampton Elementary School
<i>PWS Address</i>	Kings Highway
<i>City/Town</i>	Westhampton, Massachusetts
<i>PWS ID Number</i>	1331007
<i>Local Contact</i>	Mr. Donald MacLeod, Principal
<i>Phone Number</i>	413-528-4015

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1331007-01G	180	467	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

### The Well

Westhampton Elementary School is a rural, elementary school located on the south side of Kings Highway in Westhampton. The school student and staff population is approximately 175 people per day and is served by a single potable supply well (Well #1) located north of Hathaway Road.

The well has a Zone I protective radius of 180 feet and an Interim Wellhead Protection Area (IWPA) radius of 467 feet based on pumping test data and Zone I restrictions. The well was tested at a rate of 2.8 gallons per minute (gpm) under the New Source Approval Process and was granted an approved withdrawal rate of 3,024 gallons per day (2.1 gpm). Well #1 is a 6-inch diameter well drilled to a depth of approximately 405 feet below

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

ground. The driller's log states that sandy glacial till and boulders were encountered from ground level to approximately 85 feet below ground, where bedrock was encountered. The driller logged the bedrock as granite and sandstone to the final well depth. However, the geologic map of the area states that the bedrock is primarily a phyllite and carbonaceous schist with quartz and quartz marble intrusions of the Gile Formation dating from the Lower Devonian. One hundred twelve feet of casing was grouted into place with approximately 24-inches of casing above ground. The water is treated by aeration for removal of radon, which naturally occurs in some water. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the attached maps of the Zone Is and IWPAs and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

There are a few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Residential Uses in IWPA**
2. **Passive Recreation in Zone I**

The well is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Residential Uses in the IWPA** – Two residences are located within the IWPA of the well. Normal residential activities pose minimal threat to the water quality of the public water supply as well as their own private supply provided, they are aware of the potential hazards of household waste, lawn care chemicals and misuse of septic systems and utilize best management practices. The properties are topographically downhill from the well site.

### Recommendations:

- ✓ Provide information to residents about the potential hazards of household chemicals, lawn care chemicals and fertilizers. Provide information on Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential properties	No	Yes	Moderate	Household hazardous waste, lawn and septic systems.
Passive Recreation	Yes	Yes	Low	Evidence of low frequency passive activity.

- -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/de/p/brp/dws/](http://www.state.ma.us/de/p/brp/dws/).



## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material, such as clay that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well

- ✓ Provide educational outreach to residents regarding septic system maintenance and disposal practices.

2. **Passive Recreation in Zone I and IWPA** – Well #1 is fairly well protected and meets DEP's restrictions that only allow water supply related activities through the Zone I. There is some evidence of passive recreation through the Zone I and the IWPA along a nearby trail. Passive recreation poses minimal threat provided access to the wellhead is prevented.

### Recommendations:

- ✓ Conduct routine inspections of the wellhead and monitor for activities near the wellhead.
- ✓ If there is evidence of unauthorized access to the wellhead, consider fencing off the wellhead area. Fencing for the wellhead is an eligible project under the Wellhead Protection grant program. (See Funding below).
- ✓ Protective collars (either concrete or earthen) around the wellhead should slope away from the casing to prevent surface runoff from infiltrating along the casing.

Other activities that were noted during the assessment were the Westhampton Landfill and the multiple earth removal operations. The landfill and the gravel mining operations appear to be located down and/or cross gradient to the well.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Westhampton Elementary School is commended for current protection measures.

Please review and adopt the key recommendations listed above and as follows:

### Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider gating the wellhead.
- ✓ Post drinking water supply sign at the intersection of Hathaway Road and Kings Highway.
- ✓ Provide information to residents about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Provide information on Best Management Practices (BMPs) for the use of fertilizer lawn care, pesticides and household hazardous waste.
- ✓ Provide educational outreach to residents regarding septic system maintenance and disposal practices.

### Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations such as at the intersection of Hathaway Road and Kings Highway.
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

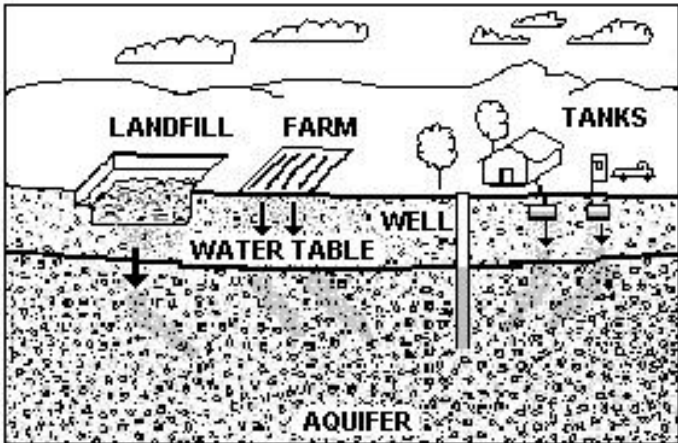


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

### Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Concrete or earthen pads should slope away from well to prevent surface runoff from ponding around the wellhead.

### Planning:

- ✓ Work with local officials in Westhampton to include the school well's IWPA in an Aquifer Protection District Bylaw and to assist you in securing protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at

<http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## 3. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
OUTLOOK FARM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
March 4, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Outlook Farm
<i>PWS Address</i>	136 Main Rd., Rte 66
<i>City/Town</i>	Westhampton, Massachusetts
<i>PWS ID Number</i>	1331009

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1331009-01G	100	417	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

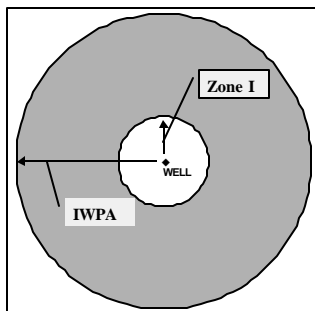
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1331009-01G)**

Zone I = 100 ft.  
IWPA = 417 ft.



### How Was My Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and the IWPA. The **high** susceptibility to potential non-microbial threats is based on the local roads, the storage and use of hazardous materials and agricultural activities within the Zone I and the IWPA.

This source water assessment report is based on information provided by staff during a site visit, water quality data and/or from other sources of information.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report For Whately Water District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
January 14, 2002

Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	<b>Whately Water District</b>
<i>PWS Address</i>	<b>Chestnut Plain Road</b>
<i>City/Town</i>	<b>Whately, Massachusetts</b>
<i>PWS ID Number</i>	<b>1337000</b>
<i>Local Contact</i>	<b>Mr. Paul Fleuriel</b>
<i>Phone Number</i>	<b>413-665-4891</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1337000-01G	245	605	Moderate
Well #2	1337000-02G	245	605	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Whately Water District is small, rural water supply that serves the center of the Town of Whately with a total of 43 connections. The area includes residents, town offices, the post office and a restaurant; all are served by on-site septic disposal. The District maintains three wells; two active wells, Wells #1 (01G) and #2 (02G) that pump simultaneously to a gravity tank, located in a secure facility. A booster pump is used to pressurize the system by pumping to a hydropneumatic tank. There is an unapproved well #3 (03G) kept as an emergency source. Although this report does not address that well specifically, well #3 is located in the same vicinity as the active wells. The system does not have a back-up power source.

The Zone I and Interim Wellhead Protection Area radii for Wells #1 and #2 are 245 feet and 605 feet, respectively. The protective radii were based on a maximum month,

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

average daily pumping rate of 9,240 gallons per day (gpd). Please refer to the attached map that shows the Zone I and IWPA radii. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wells may be larger or smaller. The District does not own the entire Zone I for the wells.

Wells #1 is 300-foot deep, 6-inch diameter bedrock wells with an estimated yield of 6 gpm. Well #2, located approximately 140 feet from Well #1, is a 440-foot deep well with an estimated yield of 15 gpm. Both wells are completed with 20 feet of casing and extend approximately 2 feet above grade. The wells are located on an upland area underlain by till and shallow bedrock. The bedrock is mapped as the Conway Formation, an argillite (carbonaceous phyllite) with quartz veins. The bedrock is highly folded and faulted; the Whately fault is mapped near the well site. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The Whately Water District well water does not require and does not have treatment at this time. For current information on monitoring results, please review the Consumer Confidence report (CCR) that is issued annually by the water supplier or refer questions to the water supply contact listed above in Table 1.

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the Zone I and IWPA, as seen in Tables 2. The District is commended for current efforts to protect the water supply.

#### Key land use issues include:

1. **Non-conforming Zone I**
2. **Residential homes**
3. **Septic system**

**1. Non-conforming Zone Is** – The Zone Is for Wells #1 and #2 are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is and requires ownership or control of the land. Although there are no activities other than passive recreation within the Zone I, the District does not own the entire Zone I for the supply wells. Please note that systems not meeting DEP Zone I requirements must

**Table 2: Table of Activities Common to the Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transformers (above grade)	Well #1	Well #2	Moderate	Potential release of MODF
Septic system components	No	Both Wells	Moderate	All components in IWPA
Residential homes, lawns and parking	No	Both Wells	Moderate	Household hazardous materials, pesticides and herbicides
Passive recreation	Both Wells	Both Wells	Low	Some evidence of passive recreation

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

**Recommendations:**

- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Consider entering into an agreement for the right of first refusal to purchase the land if it becomes available for purchase or consider purchasing the development rights (Conservation Restriction).
- ✓ Record water meter data to monitor water use and help assess system for potential leaks.
- ✓ Consider testing well #3 so that it may be utilized as a supplemental source for the system. Decommission all unused wells/borings to prevent contamination of the aquifer.
- ✓ Monitor the transformer near the wells. Eliminate limbs and trees that may pose a threat to the transformers. Contact the utility to ensure that the oil in the transformers does not contain PCBs.

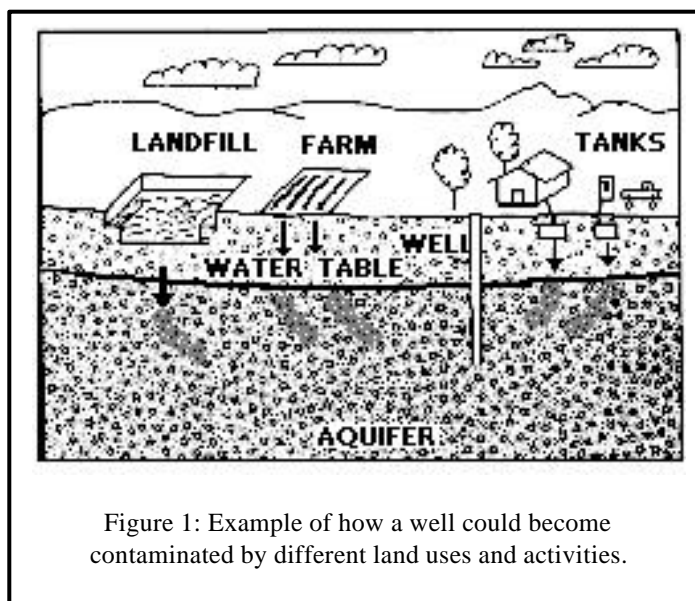


Figure 1: Example of how a well could become contaminated by different land uses and activities.

**2. Residential homes** – Residential development includes homes nearest to the wells. Normal residential activities pose minimal threat to the water quality of the public water supply provided homeowners are aware of the potential hazards of household waste, lawn care chemicals, animal waste and improper disposal through septic systems and they utilize best management practices.

**Recommendations:**

- ✓ Provide residents with information about protecting the facilities resources. Include information on Best Management Practices (BMPs) for the use of pesticides, household hazardous waste and septic system maintenance and disposal practices.
- ✓ Encourage residents to utilize the Franklin County Solid Waste Management facilities for household hazardous waste and paint exchange.

**3. Septic systems** - Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply. The systems all appear to be topographically downgradient from the wells.

**Recommendations:**

- ✓ Refer to recommendations under item 2.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

Other activities noted were evidence of passive recreation, hiking trail, near the wells. If there is evidence of increased use or loitering, consider fencing off the area or relocating the trail. Work with the DEP and local officials such as the Police, Fire and Highway Departments regarding protecting the water supplies through emergency response coordination.

### 3. Protection Recommendations

To reduce the system's susceptibility to contamination, please review and adopt the following recommendations:

**Priority Recommendation:**

- ✓ Test well #3 for use as a supply and decommission all unused wells.

**Zone I and IWPA:**

- ✓ Keep all non-water supply activities out of the Zone I.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Prohibit public access to the wells by locking facilities and posting signs at the facility entrance. Check the integrity of the well caps regularly and replace as necessary. Decommission or seal any old wells that did not produce water.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism.



## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the public water supplier and town boards.

- ✓ Work with the local fire department, DEP, State highway, and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Be sure that the town is aware that your facility is a public water supply so that you can be notified of any accidents or threats from accidents. Ask that your facility be included in Town wide water supply protection efforts.

## Training and Education:

- ✓ Continue staff training on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, certified operator, and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

## Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any hazardous materials at the facility. To learn more, see the hazardous materials guidance manual at [www.state.ma.us/dep/bwp/dhm/dhmpubs.html](http://www.state.ma.us/dep/bwp/dhm/dhmpubs.html).
- ✓ Continue utilizing Best Management Practices (BMPs) for the use of fertilizers pesticides on facility property.
- ✓ Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

## Planning:

- ✓ Work with local officials in town to include the facility IWPA in an Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

## Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.

## 4. Attachments

- Maps of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet
- Pesticide Use Fact Sheet
- Fertilizer Use Fact Sheet
- Septic system brochures
- Wellhead Protection Grant Program Fact Sheet
- Excerpt from Guidelines for Well Decommissioning



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**Whately Water Department**

### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

### Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

**Table 1: Public Water System Information**

<i><b>PWS Name</b></i>	Whately Water Department
<i><b>PWS Address</b></i>	Chestnut Plain Road, P.O. Box 23
<i><b>City/Town</b></i>	Whately, Massachusetts
<i><b>PWS ID Number</b></i>	1337010
<i><b>Local Contact</b></i>	Mr. William Smith
<i><b>Phone Number</b></i>	(413) 665-3080

### Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

## Section 1: Description of the Water System

### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

### Groundwater Sources

Zone II #: 203

Susceptibility: High

**Well Name**

**Source ID#**

Well #1 (01G)

1337010-01G

Well #2 (02G)

1337010-02G

Whately is a mid-sized agricultural and growing residential community in the Connecticut River valley in western Massachusetts. The Whately Water Department operates and maintains two wells. The two wells are located within approximately 40 feet of each other west of I-91 in the south-central portion of Town. Well 01G is a 6-inch diameter gravel developed well and serves as the back-up well for the Water Department; Well #2 (02G), the main source, is a 12-inch diameter, gravel developed well. Both wells are screened at depths of approximately 200 feet. The Water Department was formed in the mid-1980's and the wells developed after it was determined that numerous, shallow, private wells were contaminated with the pesticides ethylene dibromide (EDB) and aldicarb (Temik). The wells are developed in a confined, sand and gravel aquifer, with a thick clay layer protecting the lower aquifer from potential contaminants from the fields. Recharge to the lower aquifer comes from more remote areas along the edge of the valley and areas to the north. Each well has a Zone I protective radius of 400 feet. The Conceptual Zone II for the wells was delineated as part of the New Source Approval process and based on approved withdrawal rates of 100 gpm for Well #1 and 150 gpm for Well #2. Because of

the close proximity of the wells, the Zone II for the wells is the same and extends to the south into Hatfield and north to near the Whately—Deerfield border.

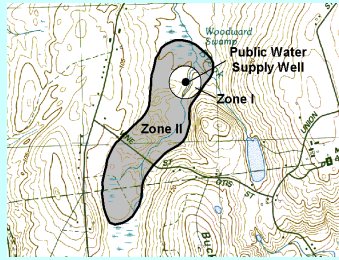
The wells are located in a deep, buried bedrock valley aquifer, filled with sand and gravel deposited during the recession (melting) of the glaciers some 12,000 to 18,000 years ago. At that time, Glacial Lake Hitchcock was formed in this area leaving a thick layer of lake clay in some areas overlying the deeper sand and gravel aquifer. The Whately wells are screened in a sand and gravel deposit that is overlain by the clay layer that is estimated to become thicker to the east and thinner to the west where the upland areas are. There is some evidence that the clay layer “pinches out” to the west where much of the aquifer recharge is likely to occur. Hydrogeological investigations indicated a channel of coarse sand and gravel trending north/ south that the wells are screened in.

The wells are located in an aquifer with a high vulnerability to contamination. Although there is a confining clay unit where the wells are located and in a portion of the Zone II, the confining unit is not contiguous throughout the area and therefore, due to the absence of hydrogeologic barriers (i.e. confining clay layer) that can prevent contaminant migration from the ground surface, the aquifer is considered vulnerable. Recharge primarily enters the aquifer along edges of the valley and in areas north of the wells. The confining unit provides some protection to the aquifer from the activities conducted on the land in the immediate area of the wells. Please refer to the attached map for the Zone II delineation outlines.

The water from the wells is treated to sequester manganese and chlorinated prior to distribution. Periodically, very low levels of volatile organic compounds are reported at concentrations well below drinking water standards. The Whately Water Department conducts an annual groundwater monitoring program that includes both water level and water quality monitoring. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



## Section 2: Land Uses in the Protection Areas

The Zone II watershed area is primarily forested, with smaller portions consisting of agriculture, residential, and commercial/industrial land uses (refer to the attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

### Key Land Uses and Protection Issues include:

1. Agricultural activities
2. Residential Land Uses
3. Transportation Corridors
4. Hazardous Materials Storage and Use
5. Oil or Hazardous Material Contamination Sites
6. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2. The Whatley Water Department owns the

Zone I of both wells. There are no activities within the Zone I that are not related to the water supply. The water is treated to sequester manganese and disinfected; the motor control and treatment building along with the formerly used backwash settling basin are located within the Zone I. In addition, a spring source for the neighboring farm is located on the Water Department property.

### Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals.
- ✓ Continue annual groundwater monitoring program.

**1. Agricultural Activities** – There are numerous farms throughout the protection areas. In fact 30% of the Zone II area consists of farmland and a small, farm is located immediately adjacent to the well site. As Whatley is well aware, pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. The clay layer in the immediate vicinity of the well site provides some protection from activities in the area. However, there is the potential for contaminants to enter the aquifer from more remote recharge areas.

### Agricultural Activities Recommendation:

- ✓ Continue working with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies. Offer information on acquiring assistance from Department of Food and Agriculture (DFA) and NRCS.
- ✓ Establish and maintain communication with DFA regarding the use of pesticides and the various crops throughout the Zone II.

**2. Residential Land Uses** – Approximately 8% of the Zone II consists of residential areas. All of the areas use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used

### For More Information

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

#### **Residential Land Use Recommendations:**

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
- ✓ Work with planners to manage new residential developments in the water supply protection areas.

#### **What are "BMPs?"**

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

**3. Transportation Corridors** - Interstate 91 runs along the eastern side of the Zone II protection area just outside for the Zone I for the wells. Local roads are present in the protection areas of the Zone IIs and watershed. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

Railroad tracks also run along the eastern edge and through a small area of the Zone II. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

#### **Transportation Corridor Recommendations:**

- ✓ Continue to regularly inspect the Zone II area for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure the Water Department is notified of spills and that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

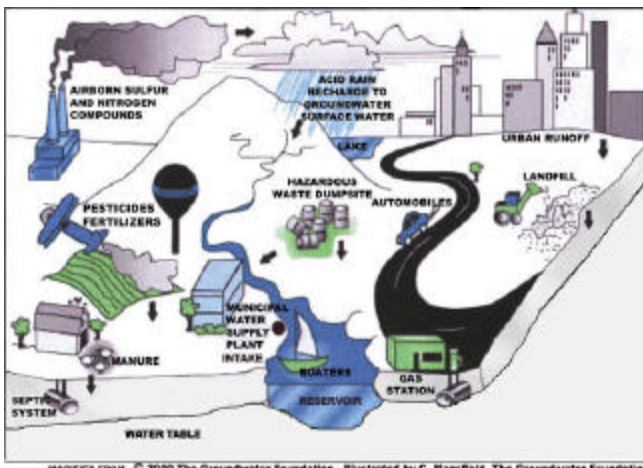


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ Promote BMPs for stormwater management and pollution controls. Contact MA Highway Department to ensure they are aware of the portions of Route 91 that run through the Zone II for purposes of stormwater and emergency management.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control. Be sure that the railroad is aware of the areas within the Zone II.

**5. Hazardous Materials Storage and Use**—Less than 1% of the Zone II for Whately's wells is utilized as

(Continued on page 6)



### Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

**Table 2: Land Use in the Watershed**

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
<b>Agricultural</b>			
Forestry Operation	1	M	Equipment and maintenance materials: leaks, spills, or improper handling; road building
Nurseries	2	M	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Dairy Farms	2	M	Management of manure (microbial contaminants)
Fertilizer / Pesticide Storage or Use	7	H	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
<b>Commercial</b>			
Railroad Tracks	1	H	Handling/ use of pesticides/herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Former Gas Station/ Body Shop	1	H	Petroleum products
Sand and Gravel Mining/ Washing	2	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks.
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Oil or Hazardous Material Sites	1	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transmission Line Rights-of-Way Type: electric line	1	L	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	Numerous	M	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides



**Notes:**

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

\* **THREAT RANKING** - Where there are two rankings, the first is for surface water, the second for groundwater sources. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

commercial or industrial land. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

**7. Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 1-000488. Refer to the attached map and Appendix 3 for more information.

**Oil or Hazardous Material Contamination Sites Recommendation:**

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites. Contact the DEP Bureau of Waste Site Cleanup (BWSC) for additional information about the site at (413) 784-1100 or visit the DEP web site <http://www.state.ma.us/dep/bwsc/sites/report.htm>.

**8. Protection Planning** – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Wellhead Protection Plans coordinate community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Wellhead Protection Plans coordinate community efforts, identify protection strategies, establish a timeframes for implementation, provide a forum for public education and outreach, and can help to pass bylaws or regulations for landuse controls. The development of a successful Plan is outlined in five steps in DEP’s “Developing a Local Wellhead Protection Plan” (see Appendix A for the full report) as:

- Establish a protection committee or team
- Define the Water Source Protection Areas
- Identify potential sources of contamination
- Protect and manage the source protection areas
- Conduct ongoing public education and outreach

Franklin County Regional Council of Governments has been retained by the Town through a Wellhead Protection

Grant awarded by the DEP to complete a wellhead protection plan. The committee, along with FRCOG should compile the information supplied in the Zone II reports, this and other reports; include copies of maps outlining the protection areas (Zone I and Zone II) and detail the protection measures in place. Outline a plan with a time line for completion of the various plan components. Submit your written report to the DEP Regional office and/or Boston office for approval.

#### Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Work with the protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials in Whately to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local Board of Health controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Include provisions for controlling public access to the Zone Is and watershed in any future planning.
- ✓ Part of the strategy for protection of the public water supply should include Right of First Refusal, purchase of land or conservation restrictions.

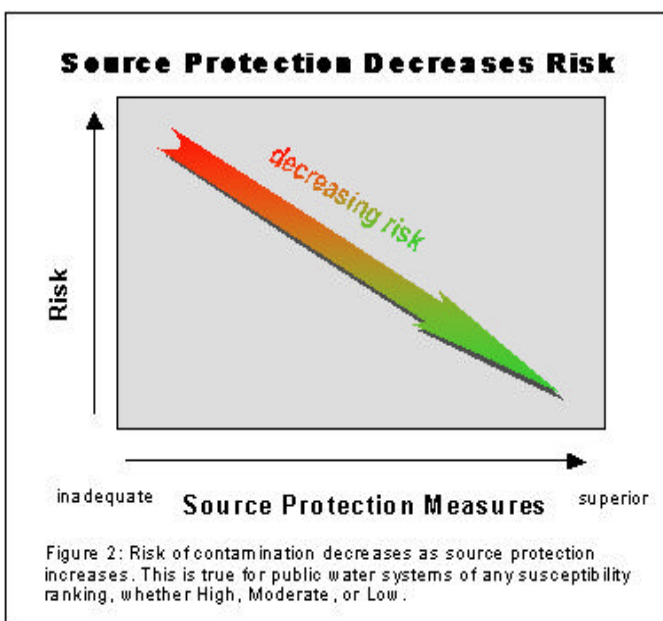
Other land uses and activities within the Zone IIs and watershed that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. In addition, there are numerous commercial facilities along State Road that are immediately adjacent to the Zone II and are within the Zone III or secondary recharge area. Although the potential risk from

these facilities is somewhat diminished, an inventory of these land uses provides additional information to local emergency responders and the use of BMPs at all facilities protects the environment and minimizes additional threat to the aquifer.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources.

#### Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
  - ♦ Increased monitoring and treatment
  - ♦ Water supply clean up and remediation
  - ♦ Replacing a water supply
  - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

### Section 3: Source Water Protection Conclusions and Recommendations

#### Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Daily inspections of Zone I and II watershed lands.

- Purchase of additional watershed land.
- The preparation of a Wellhead Protection Plan for the watershed.

#### **Source Protection Recommendations:**

To better protect the sources for the future:

- ✓ Continue to inspect the Zone Is regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your protection areas and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

#### **Conclusions:**

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

#### **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

#### **Educate Residents:**

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous

materials include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Animal waste is also a source of microbial contamination.

#### **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

#### **Plan for the Future:**

One and of the most effective means of protecting water supplies is local planning, include adoption of local controls to protect land use, regulations related to watersheds and ground water protection. These controls may include health ordinances/regulations, discharge prohibitions, general ordinances, and zoning by laws that prohibit or control potential sources of contamination within wellhead protection areas.

*(Continued on page 9)*

#### **What is a Zone III?**

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II .
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

#### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. These recommendations are only part of your ongoing local drinking water source protection.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## **Section 4: Appendices**

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>YES</b>	Continue to inspect and protect open space in the Zone 1. Where land is not available for purchase, consider the use of conservation restrictions.
Are the Zone I and II posted with “Public Drinking Water Supply” Signs?	<b>YES</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Monitor activities in Zone I.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	<b>NO</b>	Work with the Planning Board and the Board of Health to compare land use controls to see that they meet current requirements of 310 CMR 22.21(2). Refer to <a href="http://mass.gov/dep/brp/dws/">mass.gov/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations. Whately does have hazardous Materials Handling by laws
Do neighboring communities protect the water supply protection areas extending into their communities?	<b>NO</b>	Hatfield does have protective by laws. However, the protection area must be revised to include the newly delineated Zone II for the Omasta well.
<b>Planning</b>		
Does the PWS have a local wellhead protection plan?	<b>In process</b>	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	<b>YES</b>	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	<b>YES</b>	Encourage past committee to reconvene, and also include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	There are no commercial or industrial activities in the watershed, but there are some that should be inspected within the Zone IIs. For more guidance see “Hazardous Materials Management: A Community’s Guide” at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide watershed protection education?	<b>NO</b>	Currently outreach is mainly to school groups. Increase residential outreach through bill stuffers, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs.

## APPENDIX B: REGULATED FACILITIES NEAR THE WATER SUPPLY PROTECTION AREA

**Note:** All of these facilities are outside of the Zone IIs for the system wells. However, they are within the Zone III, very near the border of the Zone II, and so runoff from a spill or leak at these facilities could drain to the Zone II.

### DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
131813 *	West Track, Inc. *	164 West St Rte 5	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
*	C.N. Wood Co. Inc. *	69 State Road	Whately	Generator of Hazardous Waste	Very Small Quantity Generator
205621*	Federal Express Corp. *	173 West St Route 5 & 10	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
328650 *	Hatfield Equipment Co. *	Mountain Rd	Hatfield	Generator of Hazardous Waste	Very Small Quantity Generator
*	Orchard Trailers *	78 State Road	Whately	Generator of Hazardous Waste	Very Small Quantity Generator

Note: This appendix includes only those facilities that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

\* These facilities are located just outside of the Zone II area.



## **APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas**

DEP's data layer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

**Table 1:** Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

<b>RTN</b>	<b>Release Site Address</b>	<b>Town</b>	<b>Contaminant Type</b>
1-0000488	361 West St	HATFIELD	Oil and Hazardous Material
1-0010136*	Depot Road	HATFIELD	Oil and Hazardous Material

For more location information, please see the attached map, which has the release sites located by RTN and refer to <http://www.state.ma.us/dep/bwsc/sitelist.htm> for additional site information.

\* Site is just outside of the Zone II area.

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
SNOW FARM



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 24, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Snow Farm
<i>PWS Address</i>	5 Clary Rd
<i>City/Town</i>	Williamsburg, Massachusetts
<i>PWS ID Number</i>	1340001

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #1	1340001-01G	100	415	High	Moderate
Well #2	1340001-02G	135	438	High	Moderate
Well #3	1340001-03G	123	432	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

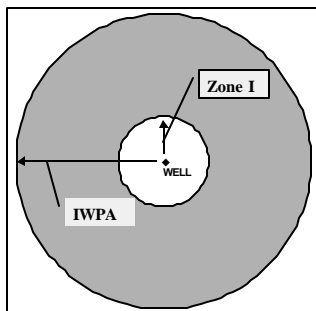
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1340001-01G)**

Zone I = 123 ft.  
IWPA = 432 ft.



### How was my Well's Susceptibility Determined?

Your wells' **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I and IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the parking areas, buildings and local roads within the Zone I and the IWPA.

This source water assessment report is based on information provided by you on your 2000 Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Source Water Assessment Program (SWAP) Report For Sweet Brook Care Centers, Inc.

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
December 5, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Sweet Brook Care Centers, Inc.</b>
<i>PWS Address</i>	<b>1561 Cold Spring Road</b>
<i>City/Town</i>	<b>Williamstown, Massachusetts</b>
<i>PWS ID Number</i>	<b>1341003</b>
<i>Local Contact</i>	<b>Guy Lewis</b>
<i>Phone Number</i>	<b>413-458-8127</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1341003-01G	175	470	High
Well #2	1341003-02G	288	798	High
Well #4	1341003-04G	316	1008	Moderate
Well #5	1341003-05G	319	1043	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The Sweet Brook Care Centers, Inc., located in Williamstown, consists of two facilities serving a combined population of about 300 residents and staff. The rural community system is served by four wells, and utilizes the town's sanitary sewer line for wastewater disposal. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

significantly larger or smaller than the IWPA. The Zone I and IWPA radii for wells #1 and 2 have been calculated from available metered data. Well #1 is a 175-foot deep well with a Zone I radius of 175 feet and an IWPA radius of 470 feet. Well #2 is a 288-foot deep well with a Zone I radius of 288 feet and an IWPA radius of 798 feet. These two wells are manifolded together, used as stand-by wells, and are tested regularly to remain active and available. Wells #4 and 5 are manifolded just after well 4. Well #4 is an 8-inch diameter, 590-foot deep well with an approved pumping rate of 19 gpm; the Zone I and IWPA radii are 316 feet and 1008 feet, respectively. Well #5 is a 6-inch diameter, 400-foot deep well with an approved pumping rate of 20 gpm; the Zone I and IWPA radii are 319 feet and 1043 feet, respectively. Wells 4 and 5 were tested and approved under the DEP New Source Approval process and are therefore in compliance with the Zone I restrictions. Well #3 (03G) is an emergency source used only for fire protection and is not addressed in this report.

The mapping by USGS describes the bedrock in this area as phyllite and schist with a thin layer of till over bedrock. The wells utilize the bedrock aquifer and there is no evidence of a confining, protective clay layer in the immediate vicinity of wells 4 and 5. Review of the driller's log indicates the following: well #4 was drilled into limestone bedrock with one foot of till on the surface; well #5 was drilled into limestone bedrock with 17 feet of overburden described as sandy hardpan and gravel. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Wells utilizing aquifers within a protective clay barrier are considered less vulnerable. Reportedly, wells 1 and 2 are located in an area with clay overburden; however, this information could not be verified specifically for these well locations.

Although the facility utilizes a water softener, there is no other treatment of the water. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the wells and activities within the protection areas.

## 2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

#### Key issues include:

1. **Nonconforming uses in Zone I;**
2. **Underground Storage Tank;**

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage - Below Ground (UST)	None	Wells 1, 2 & 4	High	New 10,000 gallon heat oil tank with containment and monitoring
Parking lot & roads	Wells 1 & 2	All Wells	Moderate	Restrict fertilizer, pesticides, and road salt use
Electrical Transformers	Well 2	Wells 1, 2 & 4	Moderate	Request information regarding PCB in MODF change from your electric company
Horse and Dairy cow pastures	None	All Wells	Moderate	Use BMPs for management
Recreational Activities	None	Well 5	Low	Athletic fields and passive recreation
Nursing Home	Wells 1 & 2	All Wells	Low	Nonconforming Zone I (Wells 1 & 2)

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).



### 3. Horse and Dairy cow pastures; and

#### 4. Electrical Transformers.

The overall ranking of susceptibility to contamination for wells 1 and 2 is high, based on the numerous land uses and activities in the Zone I. and IWPA, as seen in Table 2. The ranking of well 5 is moderate due to moderate threat activity in the Zone I of the wells and few threats within the IWPA.

**1. Nonconforming uses in Zone I** – Currently, the water supplier does not own or control the entire Zone I area for wells 1 and 2. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. Structures, parking lots, and State Route 7 are all found within the Zone I of these two wells.

#### Recommendations:

- ✓ Control access to the wellhead area and make every effort to acquire Zone I control or ownership, as practical.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prepare an emergency response plan for responding to an accidental release.
- ✓ Do not conduct any additional activities within the Zone I. Contact MA DEP prior to conducting any activities within Zone I.

**2. Underground Storage Tank (UST)** – There is a UST located between the parking lot and the northern-most building, with a capacity of 10,000 gallons of fuel oil. The UST is relatively new with containment and a monitoring system. If managed improperly, USTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

#### Recommendations:

- ✓ All USTs in close proximity to the water supply should be closely monitored especially during deliveries.
- ✓ Any upgrades and modification in the future must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

**3. Horse and Dairy Cow Pastures** -- There are livestock activities in and adjacent to the IWPA of the wells. There is a pasture for pleasure horses within the IWPA for wells 4 and 5, and a commercial dairy farm pasture for grazing within the IWPA for wells 1 and 2. Animal wastes, if improperly managed, could potentially cause contamination of the water supply.

#### Recommendations:

- ✓ Attempt to obtain an agreement from the commercial farm owner/operator that they will:
  - Follow all applicable UMASS recommendations on Integrated Pest Management.
  - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
  - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.

Information on funding and other resources for agricultural

#### Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

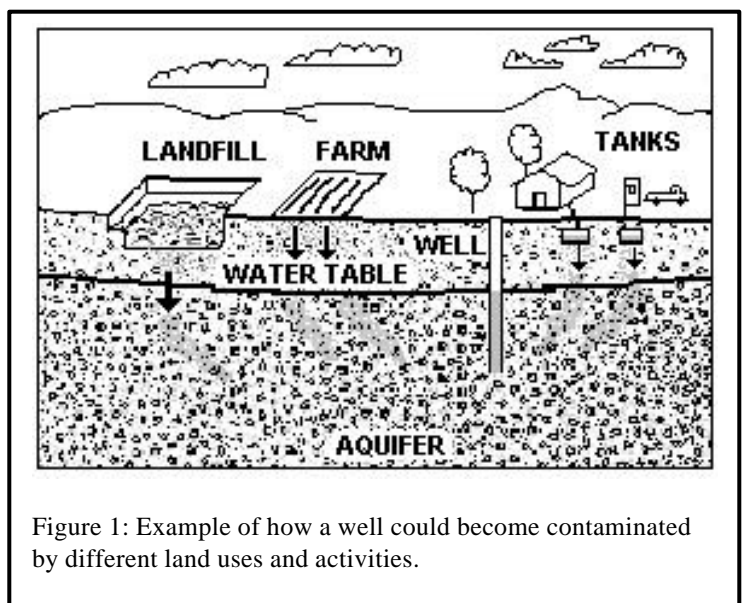


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>

**4. Electrical Transformers** – Electrical transformers contain Mineral Oil Dielectric Fluids (MODF). Although the use of PCBs is banned in new transformers, historically, PCBs were used in some transformers. If the transformers have not been changed since 1980, they may still contain PCBs.

#### Recommendations:

- ✓ Contact the local utility to determine if the transformers contain PCBs. If PCBs are present, urge immediate replacement of the oil.
- ✓ Keep the area near the transformers free of tree limbs that could endanger the transformer in a storm.

Other activities noted during the site visit were athletic fields and the use of trails for passive recreation. These activities pose minimal threat to the water supply provided no chemical fertilizers or pesticides are used in the immediate vicinity of the wells. Continue communications with the school and monitor recreational activities as necessary.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the Sweet Brook Care Centers' susceptibility to contamination. Sweet Brook Care Centers are commended for utilizing the town's sewer system, using propane for backup fuel sources, and having a well protected main water source. Sweet Brook Care Centers should review and adopt the key recommendations above and the following:

#### Priority Recommendations:

- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, etc.

#### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Do not conduct any non-water supply activities within the Zone I to comply with DEP's Zone I requirements.
- ✓ Continue regular monitoring of back-up wells.
- ✓ Control public access to the wells: lock facilities, gate access roads, and post signs at facility entrance and parking areas.
- ✓ If the Town and/or Sweet Brook Care Centers intend to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Maintain road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

### Facilities Management:

- ✓ Monitor all oil deliveries for accidental spills by overflow.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property. Do

not use fertilizer, herbicides or pesticides in the Zone I.

- V Protective collars around wellheads should slope away from the well, and the well casing should extend above ground.
- V For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm. Transformers that were installed before 1980 may contain PCBs.
- V The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and regulatory requirements, if any.

### **Planning:**

- V Work with local officials in Williamstown to include Sweet Brook Care Centers' IWPA's in Aquifer Protection District Bylaws and to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

### **Agricultural:**

- V Encourage commercial farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing soil nutrient and manure management issues. If they do not have a farm plan, recommend the plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices* Plan through the Natural Resource Conservation Service.

### **Funding:**

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response application package for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet
- Pesticide Use Fact Sheet
- Manure Management Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Waubeeke Springs

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 14, 2003

**Table 1: Public Water System (PWS) Information**

<b>PWS Name</b>	<b>Waubeeke Springs</b>
<b>PWS Address</b>	<b>47 New Ashford Road</b>
<b>City/Town</b>	<b>Williamstown, Massachusetts</b>
<b>PWS ID Number</b>	<b>1341004</b>
<b>Local Contact</b>	<b>Mr. William Enser</b>
<b>Phone Number</b>	<b>413-243-1416</b>

Zone II GIS ID #	603	System Susceptibility	<b>Low</b>
Spring Name		Zone I, ft (squares)	Susceptibility
Spring #1	1341004-01G	800	Low
Spring #2	1341004-02G	800	Low

## Introduction

We are all concerned about the quality of the water we drink. Ground water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Waubeeke Springs is a small community system that serves approximately 20 homes in Williamstown. Williamstown is a small community in the northwest corner of Massachusetts with a diverse economic base of education, agriculture, retail, industry and residential activity. Waubeeke Springs maintains two (2) spring sources of water. The

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

bedrock spring sources (01G and 02G) are located in relatively close proximity to each other in the central section of town.

During the early 1990s, the system was completely reconstructed to protect the sources from surface water runoff and influence. The springs are primarily bedrock springs discharging water from fractured dolomite. However, the immediate vicinity of the springs has some minor unconsolidated sand and gravel materials (stratified drift) of undetermined thickness that may contribute some recharge to the spring system. The collection boxes were reconstructed and the area graded to protect the springs from surface influences. The bedrock in the area is mapped as the Stockbridge Formation, a dolomite/marble. There is significant bedrock exposure in the area with some areas of thin to moderate depth of till overlying bedrock. There is no evidence of a significant and continuous protective, confining unit throughout the protection areas. Sources located in aquifers such as this are considered to be highly vulnerable to contamination from activities conducted on the land surface in the recharge areas.

The Zone I is the most protected area around a groundwater source. The Zone I for a spring is a square area centered on the source in the direction of flow with the source 50 feet from the downgradient edge of the Zone I. The lengths of the sides of the square are based on the estimated flow from the spring or estimated volume of water used from the source. The maximum estimated flow from the springs was over 240 gpm and therefore the length of the sides of the square Zone I area is 800 feet. The volume of the discharge ranged from 49 gpm to well over 240 gpm. The USGS was contracted by the DEP to determine the contribution areas (Zone II) to spring sources as part of the SWAP program. Please refer to the enclosed map for the outline of the protection areas for the sources. The entire Zone I and Zone II areas are entirely forest. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the attached maps of the Zone I and Zone II protection areas and Table 2 for additional assessment information.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The sources have had a low risk ranking for the initial round of Microscopic Particulate Analysis to determine if they area under the influence from surface water.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Wildlife/microbial	Yes	Yes	Low	The potential threat to this source, at this time, is from natural sources and not anthropogenic land use at this time.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

## Key issues include:

### 1. Wildlife/Natural microbial activity

The spring is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. Springs are by their nature, considered to have a potential high vulnerability to contamination from activities on the land surface. However, there are no identified land use threats in the Zone I or Zone II of the sources and the initial MPA testing reported a low risk of surface water influence. Therefore, the overall ranking of susceptibility to contamination for the spring is low, based on the presence of one low ranked threatening land use or activity in the IWPA, as seen in Table 2.

**1. Wildlife/Natural microbial activity** – The springs are in relatively remote areas and the first round of microscopic particulate analysis indicates that the spring source is not under the influence of surface water. However, the sources must be protected and maintained to prevent deterioration of the infrastructure by controlling erosion and surface runoff around the springs. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc. Microorganisms are microscopic creatures such as bacteria, viruses, and protozoa. Because some microorganisms are known pathogens, or disease causing agents, microbial contamination of public drinking water supplies poses a serious threat to human health.

Some known contaminants of concern in drinking water include: Bacteria, Escherichia coli (E.coli), Viruses, and Protozoa. Bacteria, viruses, and protozoa when ingested in drinking water can cause a number of infectious waterborne diseases such as cholera, typhoid, hepatitis, and infectious gastrointestinal diseases like cryptosporidiosis and giardiasis. Symptoms of waterborne disease may include fever, fatigue and weight loss (common in viral cases), vomiting, abdominal cramping, diarrhea, and stomachaches. In the most severe cases waterborne diseases can prove lethal.

#### Recommendations:

- ✓ Continue to maintain the infrastructure and control surface runoff.
- ✓ Monitor activities in the Zone I and Zone II. At other facilities, it has recently been confirmed that activities such as logging within the Zone I and II of the springs can have a detrimental impact on water quality due to the disturbance of thin overburden materials.

- ✓ Review ownership and control of lands within the Zone II and consider options for protecting that land.

## 2. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The association is commended for current and past protection measures including upgrading the infrastructure and ownership of land around the sources. With the delineation of the Zone II contribution areas for the springs, the district should review existing protection strategies, review land ownership in the Zone II and evaluate the potential for future protection of that area. If appropriate, work with the community in development of additional protection strategies.

Please review and adopt the key recommendations listed above as is feasible.

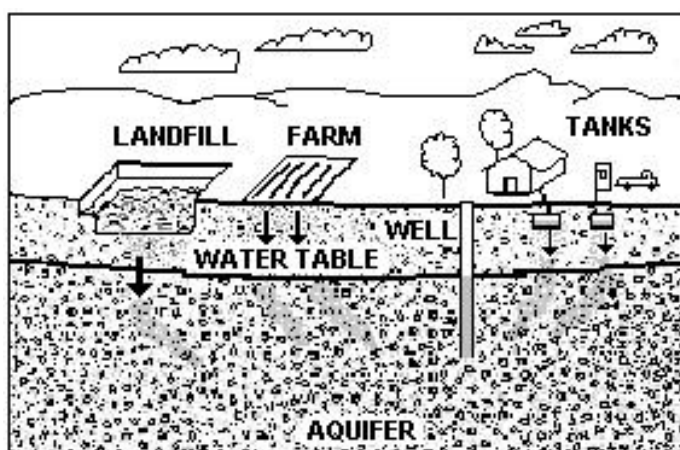


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### **For More Information:**

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### **Zone I:**

- ✓ Do not permit any non-water supply activities in Zone I.
- ✓ Continue regular inspections of the Zone I. Monitor for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the springs.

### **Facilities Management:**

- ✓ Control surface runoff around the springs to prevent infiltration and erosion.

### **Planning:**

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available and continue assessment of future needs of the system.
- ✓ Consider reviewing land ownership in the Zone II and acquiring additional land. Monitor proposed activities in the recharge areas; the Department's recent experience with another public water supplier's spring system has shown that activities such as logging upgradient from spring sources may impact water quality.

Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

### **Attachments**

- ✓ Map of the Public Water Supply (PWS) Protection Area
- ✓ Recommended Source Protection Measures Fact Sheet



# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
INSTITUTE FOR INTL COOPERATION & DEVLPMNT



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 24, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Institute For Intl Cooperation & Devlpmt
<i>PWS Address</i>	1117 Hancock Rd
<i>City/Town</i>	Williamstown, Massachusetts
<i>PWS ID Number</i>	1341006

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1341006-01G	267	688	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

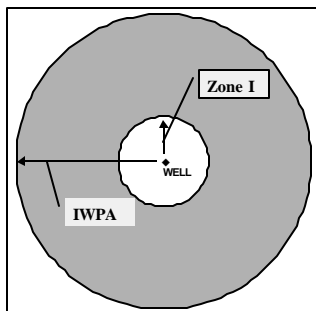
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1341006-01G)**

Zone I = 267 ft.  
IWPA = 688 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads, facility buildings and parking areas within the IWPA.

This source water assessment report is based on information provided by you on your 1999 Transient Non-Community Public Water System Sanitary Survey self-audit questionnaire, the Annual Statistical Report, water quality data and from other sources of information. DEP has not verified the accuracy of the information submitted with the survey.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- inspect the Zone I and IWPA regularly;
- work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- do not use pesticides, fertilizers or road salt within the Zone I;
- address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Mt. Greylock Regional High School

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared  
December 31, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Mt. Greylock Regional High School</b>
<i>PWS Address</i>	<b>1781 Cold Spring Road</b>
<i>City/Town</i>	<b>Williamstown, Massachusetts</b>
<i>PWS ID Number</i>	<b>1341010</b>
<i>Local Contact</i>	<b>Ms. Martha P. Mellor</b>
<i>Phone Number</i>	<b>413-458-9582 x151</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1341010-01G	175	471	High
Well #2	1341010-02G	175	471	High

## Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## Description of the Water System

The Mt. Greylock Regional High School (the school) is located in the south central section of Williamstown, Massachusetts. Williamstown is a small rural town in the northwestern corner of Massachusetts along the Vermont and New York borders. The facility consists of two major school wings located adjacent to each other serving seventh through twelfth grade; the wings are attached to each other. The total school

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

student and staff population is approximately 850 people per day. Although there is a municipal water system and a wastewater treatment facility in Williamstown only the municipal sewer serves this area of town. Therefore, the school and surrounding facilities are served by on-site water supplies.

The school is served by two potable supply wells: Well #1 – 01G and Well #2 - 02G. Both well casings terminated below grade within pits and Wells #1 and #2 are 8-inch diameter bedrock wells, 180-feet and 187-feet deep, respectively. Well #2 is located approximately 30 feet south of the school boiler room and Well #1 is located approximately 15 feet north of the school gymnasium. At the time of the assessment, the bulkheads were not secured. According to the previous reports from the school, at the time of installation, the estimated yield of the wells was 35 gpm. Normally, Well #2 supplies water to the school and cafeteria and Well #1 supplies water to the gymnasium. Either well could supply water to the entire school, however the two systems normally operate separately; valves would have to be opened to redistribute water through the system.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The wells have a Zone I protective radius of 175 feet and an IWPA protective radius of 471 feet. These protective radii were based on metered water use at the school. Please refer to the attached map that shows the Zone I and IWPA.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to conducting any work in the Zone I or expanding the system/facility.
Fuel Oil Storage	01G	Both	High	There are three USTs w/leak detection within the Zone I of Well #2.
Athletic fields	02G	Both	Moderate	Prohibit the use of pesticides/fertilizers on school fields in Zone Is. Utilize an IPM for athletic fields.
School (Middle and High Schools)	Both	Both	Moderate	Limit road deicing usage, use BMPs for hazardous materials and monitor parking areas and control stormwater.
Hazardous materials	02G	Both	High	Use BMPs for maintenance hazardous materials and laboratory materials
Transformers	02G	Both	Low	Monitor transformers for potential leaks

**-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).**

## Glossary

**Zone I:** The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The school is located just south of Phelps Knoll summit in an upland area west of the Green River valley. Geologic mapping indicates relatively thin (<50 feet) sand and gravel deposits in the vicinity of the school's wells. Well logs from adjacent facilities on Phelps Knoll indicate thin till overburden deposits over bedrock. The sand and gravel deposits in the vicinity of the school are stratified drift (sand and gravel) deposited during the recession of the glaciers some 18,000 years ago. The bedrock geology in this area is a complex series of folds and faults associated with the Taconic-Berkshire Zone. The bedrock in the immediate area of the school is mapped as carbonates (dolomite/marble) of the Stockbridge Formation.

There is no evidence of a continuous, protective confining layer such as thick clay or till in the vicinity of the wells. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water from the wells is not treated prior to distribution. Water suppliers are required to regularly monitor the quality of the water. You may request additional information regarding the current water quality from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tanks;**
3. **School facilities and athletic fields;**
4. **Transportation corridors/parking; and**
5. **Hazardous materials.**

There are several activities within the Zone Is and IWPAs that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

**1. Non-conforming Zone I** – Although the water supplier does own the entire Zone I area, there are numerous activities within the Zone I that are non-conforming. The entire school facility including fuel storage, transformers, school building, sewer lines, and parking are within the Zone I of the wells. Systems not meeting DEP Zone I requirements for ownership or control or non-conforming activities within Zone I must receive DEP approval and address Zone I issues prior to increasing water use or modifying systems/facilities.

### Zone I Recommendations:

- ✓ Prohibit any non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.

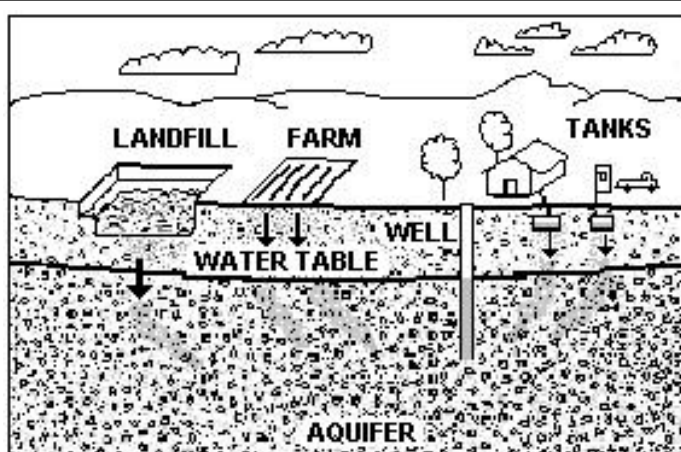


Figure 1: Example of how a well could become contaminated by different land uses and activities.



### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

### For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier and town boards.

- ✓ Do not use or store pesticides or fertilizers in Zone I.
- ✓ Inspect the wells regularly to ensure the cap is secure, there is no standing water near the well and to ensure that the bulkheads are secure. If the bulkheads cannot be secured, raise the well casing above grade, provide a secure and watertight cap and protect the casings appropriately.
- ✓ Relocate the wells if they cannot be secured or if water quality is impaired by activities near the wells.
- ✓ Monitor all activities associated with petroleum products within the Zone Is.

**2. Underground petroleum storage tanks** – There are two, 10,000 gallon fuel oil tanks and one, 1,000 gallon diesel tank UST within the Zone I of Well #2 and within the IWPA of 01G. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store. The tanks were replaced in the early 1990s.

#### Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the petroleum products, especially delivery.
- ✓ Have spill containment/absorbent materials available on-site

**3. School facilities and athletic fields** – All of the school's facilities are located within the Zone I and/or IWPA of the wells. Middle schools generally use only household type hazardous materials. Although high school laboratory and photo labs can use potentially harmful materials, the potential threat from disposal of these materials is somewhat minimized because the school is connected to the municipal sewer. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". Potential also exists for contamination of the wells by onsite use of fertilizers or pesticides on the athletic fields. The shed for lawn maintenance equipment is located outside of the protection areas.

#### Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the Zone I and IWPA.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides or fertilizers within Zone I.
- ✓ Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ For additional information, refer to the Massachusetts Public Health Association's Healthy Schools website online at [http://www.mphaweb.org/pol\\_schools.html](http://www.mphaweb.org/pol_schools.html).

**4. Transportation corridor/parking** – The school's internal transportation corridors and parking are located within the IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as, waste from wildlife and pets.



**Recommendations:**

- ✓ Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.
- ✓ Limit access to the Zone I areas and direct runoff away from the wells.

**5. Hazardous Materials Storage and Use** – The school utilizes hazardous materials for maintenance and in the laboratories and is a registered generator of hazardous waste and waste oil. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, or floor drain leading directly to the ground. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator.

**Hazardous Materials Storage and Use Recommendations:**

- ✓ Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- ✓ Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Ensure that management plans are up to date and staff review BMPs for the handling of hazardous materials.

### 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the wells' susceptibility to contamination. The Department encourages diligence in management of activities near the wells.

Please review and adopt the key recommendations listed above and as follows:

**Priority Recommendations:**

- ✓ Consider relocating the wells to areas remote from petroleum storage and intense activity at the school.

**Zone I and IWPA:**

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA and the wells.
- ✓ Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the wells.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lab chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, lab chemicals, pesticides and household hazardous waste.

**Training and Facilities Management:**

- ✓ Incorporate groundwater education into school curriculum (7-12 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.
- ✓ Staff should be instructed on the proper disposal of spent household chemicals and or lab chemicals. Include custodial staff, groundskeepers, and the certified operator.
- ✓ Manage hazardous materials and waste in accordance with regulation and in a manner protective of the water supplies and public health and safety.

**Planning:**

- ✓ Work with local officials to develop an Aquifer Protection District Bylaw that includes the school wells' IWPA's and to assist you in continued protection of the water supply.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.

- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

**Funding:**

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

#### **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment Program (SWAP) Report

For  
THE TACONIC RESTAURANT



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
January 6, 2004

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<b>PWS Name</b>	The Taconic Restaurant
<b>PWS Address</b>	1161 Cold Spring Rd
<b>City/Town</b>	Williamstown, Massachusetts
<b>PWS ID Number</b>	1341023

**Table 2: Well Information**

<b>Well Name</b>	<b>Well (Source) ID#</b>	<b>Zone I Radius (feet)</b>	<b>IWPA Radius (feet)</b>	<b>Microbial Susceptibility*</b>	<b>Non-Microbial Susceptibility**</b>
Well #1	1341023-01G	140	441	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

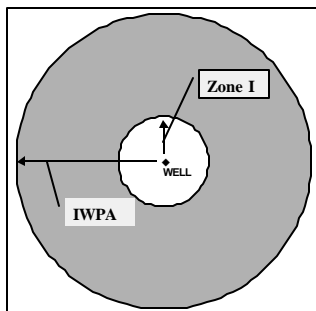
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1341023-01G)**

Zone I = 140 ft.  
IWPA = 441 ft.



### How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the Zone I / IWPA. The **high** susceptibility to potential non-microbial threats is based on the storage of hazardous materials such as heating oil within the Zone I and/or the IWPA. Other moderate threats include local roads and parking areas within the Zone I and/or the IWPA. The water from the source is disinfected prior to distribution.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

### Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

#### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

#### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

#### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report

For  
ESTES STORE



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 12, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Estes Store
<i>PWS Address</i>	Rte 9
<i>City/Town</i>	Windsor, Massachusetts
<i>PWS ID Number</i>	1345008

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well #2	1345008-02G	100	422	High	High

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

## What is Susceptibility?

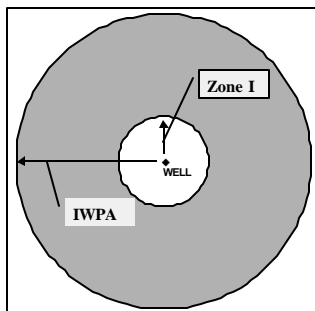
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for WELL  
#2 (1345008-02G)**

Zone I = 100 ft.  
IWPA = 422 ft.



## How was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **high** susceptibility to potential non-microbial threats is based on the gasoline USTs and local roads within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.





# Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Worthington Fire District

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
October 9, 2003

**Table 1: Public Water System (PWS) Information**

<i>PWS Name</i>	<b>Worthington Fire District</b>
<i>PWS Address</i>	<b>P.O. Box 1000, Division Street</b>
<i>City/Town</i>	<b>Worthington, Massachusetts</b>
<i>PWS ID Number</i>	<b>1349000</b>
<i>Local Contact</i>	<b>Mr. John Sullivan</b>
<i>Phone Number</i>	<b>413-238-5344</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA</i>	<i>Source Susceptibility</i>
Well #1	1349000-01G	217	533	Moderate
Well #2	1349000-02G	217	533	Moderate
Well #3	1349000-03G	301	889	Moderate
Well #4	1349000-04G	217	533	Moderate
Well #5	1349000-09G	165	460	Moderate
Well #6	1349000-10G	232	568	Moderate
Well #7	1349000-11G	255	640	Moderate
<i>Spring Name</i>		<i>Zone II GIS ID #</i>		
Spring #1	1349000-05G	291	604	Moderate
Spring #2	1349000-06G	291	605	Moderate
Spring #3	1349000-07G	291	605	Moderate
Spring #4	1349000-08G	291	606	Moderate

## Introduction

We are all concerned about the quality of the water we drink. Groundwater sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

information about funding and other resources that may be available to your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

Worthington is a small rural "hilltown" community, east of the Berkshire Hills of western Massachusetts. Worthington is primarily a residential and agricultural community that is a natural tourist attraction. The Worthington Fire District provides water for a small section of town, primarily the town center. The District maintains and operates eleven (11) sources of water. The sources are seven bedrock wells (01G-04G and 09G-11G) and four-spring sources (05G-08G); all are located in relatively close proximity to each other in the north central section of town.

During the mid-1990s, the area experienced a dry summer and the District's sources where inadequate to meet demand. Some of the existing wells were deepened and additional wells drilled to meet the system needs. Wells range in depth from 280 to 550 feet and the springs are bedrock fed springs with collection boxes that have been reconstructed and/or otherwise protected from surface water influences. The bedrock in the area is mapped as the lower Goshen Formation, a carbonaceous schist and phyllite. There is significant bedrock exposure with some area of thin to moderate depth of till overlying bedrock. Although some of the wells are flowing artesian wells, there is no evidence of a significant and continuous protective, confining unit throughout the protection areas. Sources located in aquifers such as this are considered highly vulnerable to contamination from activities conducted on the land surface. Recent experience has shown that activities that cause significant disturbance to the land surface such as logging, on areas within the Zone I and Zone II of spring sources with thin overburden or exposed bedrock, can be negatively impacted by increased turbidity in the water.

The Zone I is the most protected area around a groundwater source. The Interim Wellhead Protection Area (IWPA) is an area that is assumed to contribute recharge to the source until a scientifically determine Zone II, contribution area for a groundwater source. The radii of the Zone I and Interim Protection Area (IWPA) for the wells are based on estimated yields of the wells as determined from pumping tests conducted on each well. The estimated yield of the wells ranges from approximately 2 to 15.5 gallons per minute.

**Table 2: Table of Activities within the Water Supply Protection Areas**

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Transportation Corridor	01G, 02G, 04G, 05G	All except 06G/07G	Moderate	Limit road deicing materials; monitor and control drainage
Residential	-	All except 05G, 06G, 07G, 08G	Moderate	Provide BMPs to residents
Septic System	-	All except 05G, 6G, 07G, 08G	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn Care/Gardening	-	All except 05G, 06G, 07G, 08G	Moderate	Provide BMPs to residents

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

The Zone I for a spring is a square area centered on the source in the direction of flow with the source 50 feet from the downgradient edge of the Zone I. The lengths of the sides of the square are based on the estimated flow from the spring or estimated volume of water used from the source. The USGS was contracted by the DEP to determine the contribution areas (Zone II) to spring sources as part of the SWAP program. Please refer to the enclosed map for the outline of the protection areas for the District's sources. The Zone I, IWPA and Zone II areas are primarily forest with a single dirt road and several residences. Chlorine is added to the water for disinfection prior to distribution. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the attached maps of the Zone I, IWPA and Zone II protection areas and Table 2 for additional assessment information.

## 2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

### Key issues include:

1. **Non-conforming Zone I,**
2. **Residential uses, and**
3. **Transportation corridor.**

The sources are located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. However, the overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderately ranked land use or activity in the protection areas, as seen in Table 2.

**1. Non-conforming Zone I** – The District does not own or control the entire Zone I for all of its sources. Although the District owns much of the Zone I areas, the district does not own the entire Zone I for sources 01G, 02G, 04G and 05G. The Zone I area for these sources contains a road. DEP's land control restrictions for Zone I only allow water supply related activities in Zone I or activities that do not pose a potential threat.

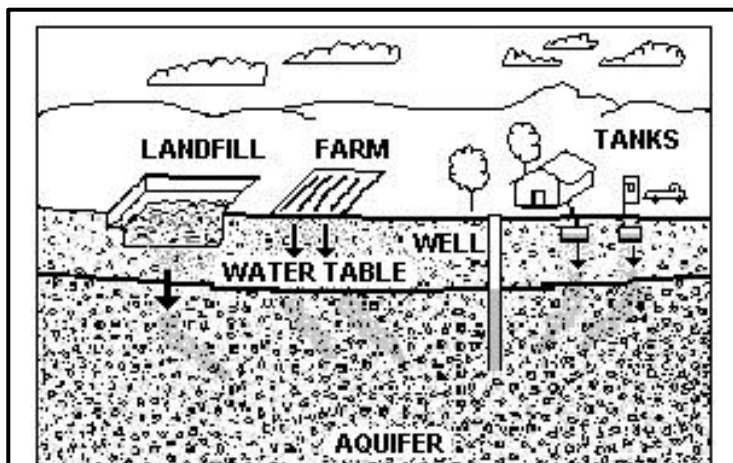


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

### Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road deicing materials, as is feasible, within the Zone I.
- ✓ Monitor road runoff to ensure that it does not flow toward the well and springs in the Zone I. Continue current efforts in upgrading and maintaining protection of the well and spring heads.
- ✓ Within the long term planning for the system, consider relocating sources adjacent to the road if activities cannot be controlled or water quality is impacted.

**2. Residential Land Uses** – The residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws) including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

### For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil/Kerosene Storage** - Private residences within the IWPA may heat with fuel oil or diesel fuel. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

### Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMPs for common residential issues.
  - ✓ Promote BMPs for stormwater management and pollution controls.
3. **Transportation corridors** – Even low use, rural residential roads can be potential sources of contamination due to use of deicing materials, leaks or spills of fuels and other hazardous materials during accidents and erosion.

### Recommendation:

- ✓ Continue current contacts with local highway department and local emergency responders department to ensure that the protection areas are included in Emergency Response Planning.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Worthington Fire District is commended for current and past protection measures including the development of a protection plan, upgrade of the infrastructure and purchase of land around the sources. With the delineation of the Zone II contribution areas for the springs, the district should review the existing protection plan, update information as appropriate and work with the community in development of additional protection strategies as appropriate.

Please review and adopt the key recommendations listed above and as is feasible.

### Zone I:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Continue regular inspections of the Zone I. Monitor for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the springs/well

### Facilities Management:

- ✓ Control surface runoff around the springs and wells' casings to prevent infiltration. Earthen or concrete berms or collars should slope away from the source and well casings should extend above ground.
- ✓ Monitor deliveries of chemicals to the facility

### Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available and continue assessment of future needs of the system.

Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

## **Attachments**

- ❖ Map of the Public Water Supply (PWS) Protection Area
- ❖ Recommended Source Protection Measures Fact Sheet

# Transient Non-Community Source Water Assessment and Protection (SWAP) Report For BERKSHIRE PARK CAMPING AREA



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection, Drinking Water  
Program

Date Prepared:  
February 25, 2004

## What is SWAP?

The Source Water Assessment Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

**Table 1: Public Water Supply Information**

<i>PWS Name</i>	Berkshire Park Camping Area
<i>PWS Address</i>	530 Harvey Rd
<i>City/Town</i>	Worthington, Massachusetts
<i>PWS ID Number</i>	1349003

**Table 2: Well Information**

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Well # 1	1349003-01G	233	570	High	Moderate

\* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

\*\* Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

## What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

## What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.



## What is Susceptibility?

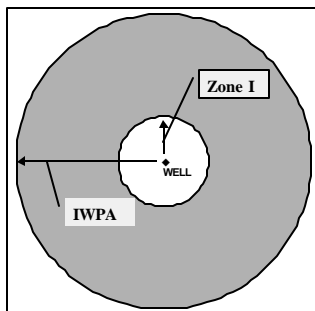
Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

**Figure 1: ZONE I/ IWPA  
EXAMPLE Source  
Protection Area for Well #1  
(1349003-01G)**

Zone I = 233 ft.  
IWPA = 570 ft.



## How Was My Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the septic system components within the IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the local roads and camp facilities within the IWPA.

This source water assessment report is based on information provided by you on your Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

## Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

### Specific Recommendations:

- ✓ inspect the Zone I and IWPA regularly;
- ✓ work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- ✓ restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- ✓ make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- ✓ remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- ✓ do not use pesticides, fertilizers or road salt within the Zone I;
- ✓ address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- ✓ water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

### Need More Information?

Additional information or sources of information can be obtained by calling Catherine Skiba at (413) 755-2119 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

### Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.