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.

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

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

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.

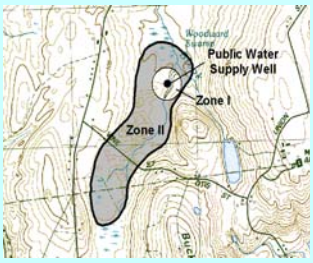
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

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

Groundwater Sources Zone II #: 208 ***Susceptibility: High***

Well Name	***Source ID***
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***

Reservoir Name	***Source ID***
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.

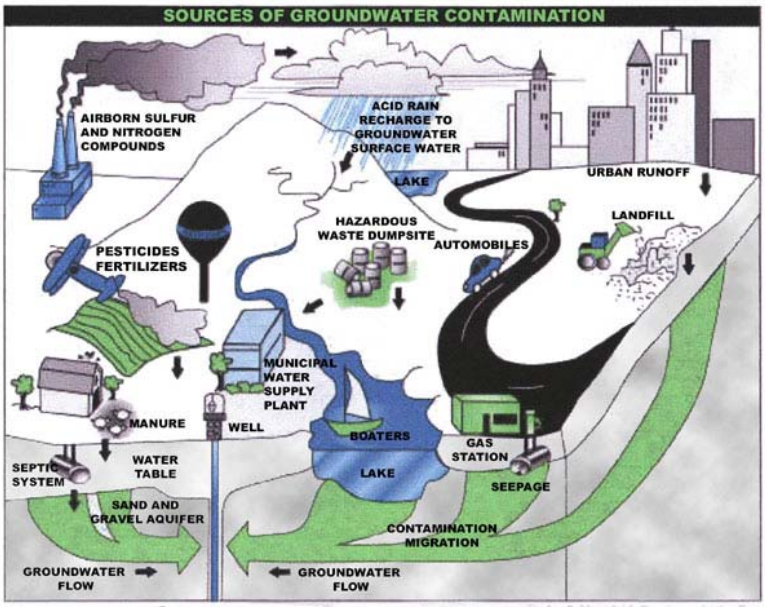
Zone C: is the remaining area in the watershed not designated as Zones A or B.

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:

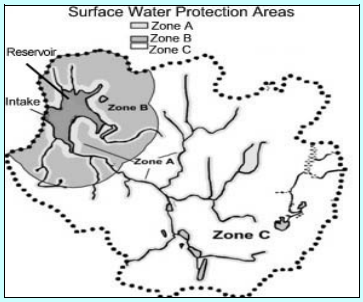
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.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

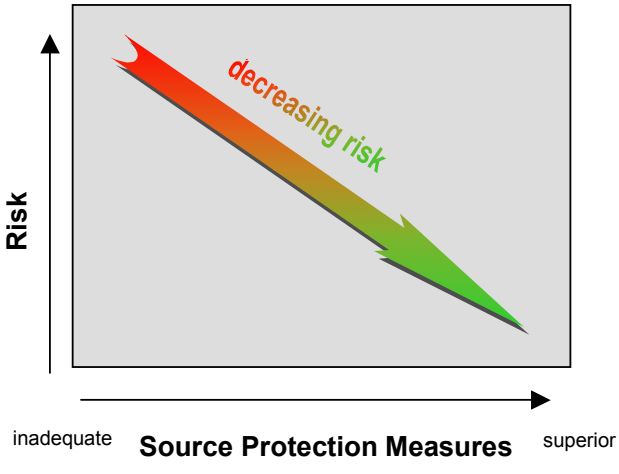


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

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*
Agricultural				
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
Commercial				
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
Industrial				
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
Miscellaneous				
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*
Residential				
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, 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, 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 not passed protective bylaws for the Lawrence Swamp Zone II area.

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 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 Activites – 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 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.

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 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

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
Zone I and Zone C		
Does the Public Water Supplier (PWS) own or control the entire Zone I/Zone As?	**NO**	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?	**YES**	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I and watershed regularly inspected?	**YES**	Continue frequent inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I/Zone A?	**YES**	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.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	**YES**	The Town "Aquifer Protection District" bylaw meets DEP's requirements in Amherst. Amherst meets best efforts for wellhead protection in Belchertown. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II/Zone C areas extending into their communities?	**NO**	Work with neighboring municipalities to include Zone II/Cs in source protection controls.
Planning		
Does the PWS have Wellhead/Watershed Protection Plans?	**YES**	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?	**YES**	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?	**YES**	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?	**NO**	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc.
Does the PWS provide source water protection education?	**YES**	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