



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.

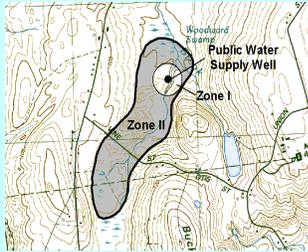
This report includes the following sections:

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

<i>Well Names</i>	<i>Source IDs</i>
Well #1	1223000-01G
Well #2	1223000-02G

Zone II # 233

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
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 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 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

Benefits of Source Protection

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

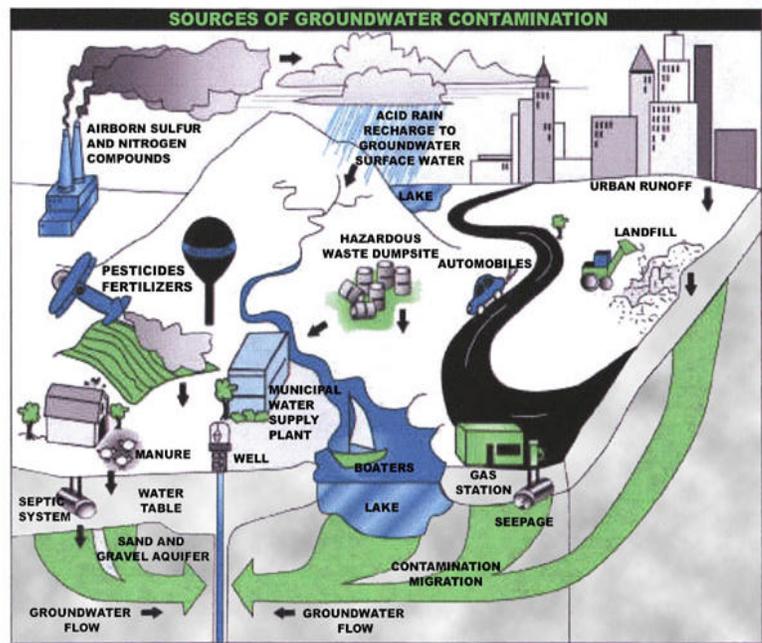
- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source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

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

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



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.

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

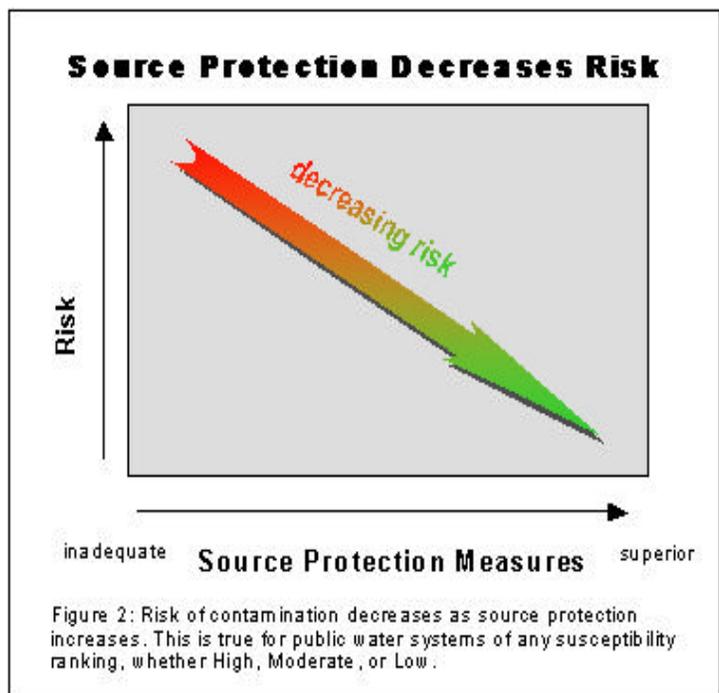
Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and assistance on improving current protection measures.

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

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)



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

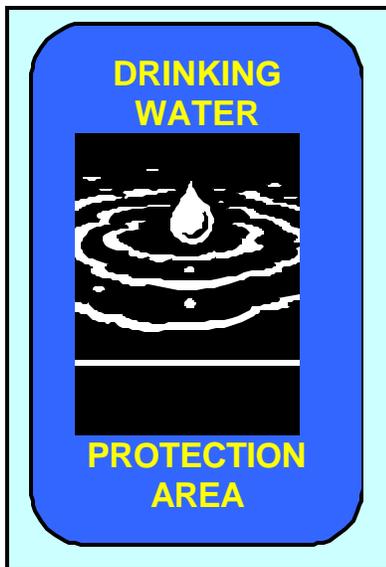
Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agriculture				
Dairy Farms	1	M	233	Manure (microbial contaminants): improper handling
Fertilizer/Pesticide Storage or Use—Crops	2	H	Both	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	233	Manure (microbial contaminants): improper handling
Nurseries	2	M	233	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Residential				
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
Miscellaneous				
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
Miscellaneous				
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, 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 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
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	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?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	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.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Modify protection measures as appropriate if regulations are modified for additional protection.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	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.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	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: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	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?	YES	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	PARTIAL	Orange does have protective bylaws and regulations, however New Salem does not. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc . Work with neighboring communities to adopt floor drain regulations.
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II and as appropriate Zone III.