Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Abington/Rockland Joint Water Works

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

PWS Name	Abington/Rockland Joint Waterworks
PWS Address	96 East Water Street
City/Town	Rockland, MA 02370
PWS ID Number	4001000
Local Contact	Daniel Callahan, Manager
Phone Number	781-878-0901

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.

This report includes the following sections:

1. Description of the Water System;
2. Land Uses in the Protection Areas;
3. Source Water Protection;
4. Source Water Protection Recommendations;
5. Additional Resources Available for Source Water Protection; and
6. 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	***Susceptibility: High***
Source Name	***Source ID #***
Myers Ave. Well #1	4001000-01G
Myers Ave. Well #2	4001000-02G
Myers Ave. Well #3	4001000-03G
Myers Ave. Well #4	4001000-04G
Surface Water Sources	***Susceptibility: High***
Source Name	***Source ID #***
Great Sandy Bottom Pond	4001000-01S
Hingham Street Reservoir	4001000-02S

The Abington/Rockland Joint Waterworks has six drinking water sources, four ground water wells and two reservoirs. These sources serve residents and businesses in Abington and Rockland, as well as small areas of Hingham, Hanson, Pembroke and Weymouth.

The Myers Street wells are located in Abington. Their Zone II extends into Abington and Whitman. Great Sandy Bottom Pond and its watershed are located in Pembroke. Hingham Street Reservoir is located in Rockland. The watershed lies mostly within Rockland and Hingham, with a very small section extending into Hanover. The Waterworks is currently expanding the volume of the Hingham Street Reservoir to meet the future water needs of the towns.

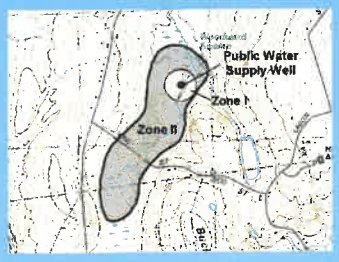
For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the public water system contact person listed above in Table 1. Drinking water monitoring data is also available on the web at http://www.epa.gov/safewater/ccr1.html.

Section 2: Land Uses in the Protection Areas

The Zone II and watersheds for the Abington/Rockland system are primarily a mix of undeveloped forest and residential development, with smaller portions consisting of agriculture and industry. A Geographic Information Systems (GIS) map showing the watershed boundaries, Zone A, Zone II and the percentages of land uses in the protection areas is provided as part of this report. Section 3 discusses protection measures implemented by the Abington/Rockland Joint Waterworks. 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 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. Residential Land Uses
2. Transportation Corridors
3. Transmission Lines
4. Hazardous Waste Generation
5. Industrial Park (including a large quantity toxic user)
6. Agriculture
7. Oil or Hazardous Material Contamination Sites
8. Aquatic Wildlife
9. Sand and Gravel Mining
10. Road and Maintenance Depots
11. Underground Storage Tank

1.**Residential Land Uses** – Over 17% of the Zone II and watersheds consists of residential homes. Thirty-nine percent (39%) of the Zone II and watersheds is undeveloped forest with the potential for more residential development. The Massachusetts Executive Office of Environmental Affairs (EOEA)'s web site, www.state.ma.us/envir/, provides detailed information and maps about the build-out of developable land in communities in Massachusetts.
If managed improperly, household hazardous waste, septic systems, lawn care and pet waste can all contribute to ground and surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks. Residences are located throughout the Zone A.

Residential Land Use Recommendations:

- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Post water supply awareness signs on streets throughout the watersheds and Zone II.
- ✓ Work with town boards to review and provide recommendations on proposed watershed or Zone II development.

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. Transportation Corridors (paved and unpaved local roads and highways) are located near the reservoir, throughout the watersheds, and within the Zone II. Spills from vehicular accidents are a major concern. In addition, 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.

Stormwater can transport contaminants into ground and surface waters, including wetlands. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Potential contaminants may come from automotive leaks, maintenance, washing, or accidents.

Transportation Corridor Recommendations:

- ✓ Establish vegetated buffers along roads and parking areas to provide some filtration of contaminants.
- ✓ Schedule regular street sweeping. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water.*
- ✓ Post water supply awareness signs on streets throughout the watersheds and Zone II.
- ✓ Conduct emergency drills to be ready for spills.
- ✓ Regularly inspect the watersheds 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 Town and State 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 available yet, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

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. Transmission (Utility) Lines - Transmission lines run through the Zone I of the wells. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendations:

- ✓ Monitor the YOP for pesticide applications.

4. Hazardous Waste Generation – A Large Quantity Generator of Hazardous Waste is located within the watershed of the Hingham Street Reservoir. If hazardous wastes are improperly stored, they become potential sources of contamination.

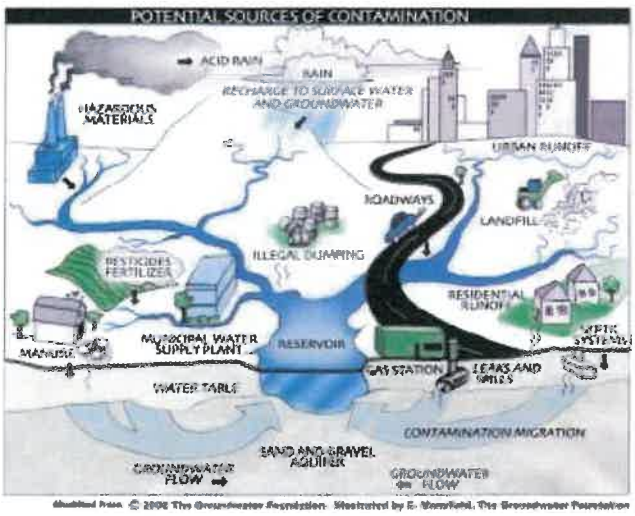


Figure 1: Sample watershed with examples of potential sources of contamination

Hazardous Waste 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 BMPs for common business issues.

5. Industrial Park, including a Large Quantity Toxic User (LQTU) - There is an industrial park located within the watershed of the Hingham Street Reservoir. Chemical use, handling and storage is a concern.

Industrial Park Recommendations:

- ✓ Request that businesses contact you in the case of spills or releases.
- ✓ Encourage BMPs for handling, storing and disposing of chemicals and metals.

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

Refer to Appendix B for more information on regulated facilities.

Land Uses	Quantity	Threat	Source		Potential Sources of Contamination*
Agricultural					
Fertilizer Storage or Use	Few	M	-	01S	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	-	01S	leaks, spills, improper handling, or over-application of pesticides
Industrial					
Chemical Storage Or Manufacture	Few	H	-	02S	spills, leaks, or improper handling or storage of chemicals of process waste
DEP Tier Classified Oil Release Sites	4	not ranked	01-04G	02S	see Appendix C for more information
Industrial Park (including Large Quantity Toxic User)	1	H	-	02S	spills, leaks or other releases of chemicals or metals; improper storage or handling
Residential					
Fuel Oil Storage (at residences)	Numerous	M/M	01-04G	01, 02S	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M/M	01-04G	01, 02S	over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Numerous	M/M	01-04G	01, 02S	microbial contaminants, improper disposal of hazardous chemicals

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities 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.
3. For information about Oil or Hazardous Materials Sites, refer to Appendix C.

* **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. 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.

Miscellaneous					
Aquatic Wildlife	Seasonal	H	-	01S, 02S	microbial contaminants
Large Quantity Hazardous Waste Generator	1	H	-	02S	spills, leaks from improper handling/storage of hazardous materials and wastes; see Appendix B for more information
Transportation Corridors	Numerous	M/H	04G	01S, 02S	accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Transmission Lines	1	L	01-04G	-	spills from over-application or improper handling of pesticides; erosion from construction
Road & Maintenance Depots	3	M/M	01-04G	01S	spills and leaks from the use and storage of sand, salt, gasoline and chemicals
Sand & Gravel Mining	1	M	-	02S	spills and leaks from heavy equipment; erosion from dewatering; may draw illegal dumping
Underground Storage Tank	1	H	01-04G	-	leaks or spills of stored materials

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities 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.
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6. Agriculture – Cranberry bogs are located within the watershed of Great Sandy Bottom Pond. 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. Agricultural activities can also be a potential source of microbial contamination. The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit animals within 100 ft. of drinking water reservoirs and their tributaries.

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 U.S. Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality—An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.
- ✓ Work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

7. Oil or Hazardous Material Contamination Sites – DEP Tier Classified Oil and/or Hazardous Material Release Sites are located within the protection areas of the wells and the Hingham Street Reservoir. Refer to the attached GIS map and Appendix C for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

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

8. Aquatic Wildlife - Geese are seasonally present on, or adjacent to, the reservoir. Waterfowl may increase coliform levels through the release of fecal matter into the water and may also carry other bacteria and viruses. Waterfowl management techniques may include noise and visual harassment, habitat modification and control of food sources. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination.*

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

1. Reduces Risk to Human Health
2. Cost Effective! Reduces or Eliminates Costs Associated With:
   - Increased 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 drirking 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.

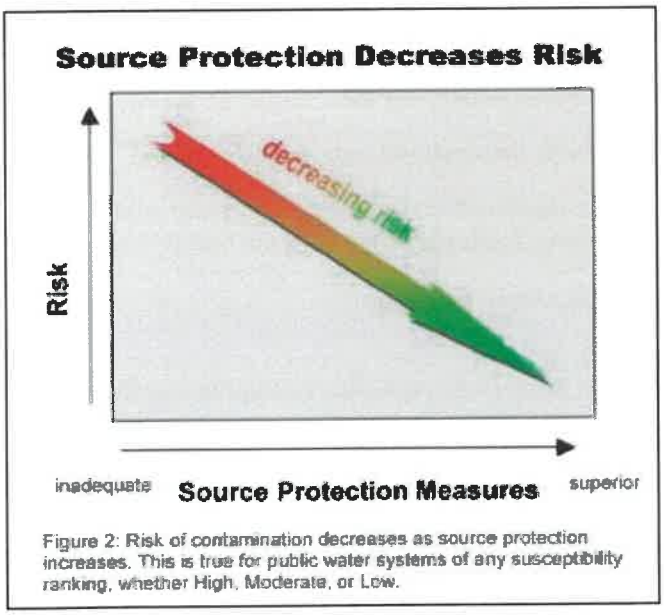

Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Aquatic Wildlife Recommendation:

- ✓ Monitor wildlife populations in and around the reservoir. Discourage feeding of geese and other waterfowl.

9. Sand & Gravel Mining - The Waterworks is undertaking an ambitious project to increase the volume of the Hingham Street Reservoir. This multi-year project involves the removal of a large amount of earthen material.

Sand & Gravel Mining Recommendation:

- ✓ Continue with site inspections and the use of appropriate erosion control and dewatering practices.

10. Road & Maintenance Depots - Abington and Whitman's Department of Public Works (DPW) yard is located within the Zone II. Pembroke's DPW yard is located within the watershed of Great Sandy Bottom Pond. Salt, sand and gasoline are used or stored at these facilities. At the time of the SWAP assessment, Whitman also had a significant amount of earthen and other materials stockpiled at their DPW yard.

Road & Maintenance Depots Recommendations:

- ✓ See Appendix A for *DPWs Protect Drinking Water.*
- ✓ Maintain contact with Whitman's DPW about the materials at their site and ensure that appropriate erosion controls are in place.

11. Underground Storage Tank (UST) - There is an underground fuel oil tank located at the wells.

UST Recommendation:

- ✓ Replace the underground fuel oil tank at the wells with an alternative fuel source when one is available at that site.

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 3: Source Water Protection

As with many water supply protection areas, this system's Zone I, 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 Abington/Rockland Joint Waterworks is commended for taking an active role in implementing source protection measures.** Some examples of their good work include the following.

Watershed Control
The Waterworks Manager does a good job of keeping up with conditions within the Zone I, Zone II and watersheds.

Emergency Planning and Response
The Joint Waterworks has an emergency plan and has tested the plan with other local responders.

Communication with Watershed Communities
The Waterworks Manager communicates with town boards in the various towns and has established a watershed protection protocol to stay aware of proposed land use changes within those communities.

SECTION 4: SOURCE WATER PROTECTION RECOMMENDATIONS

DEP recommends that the Joint Waterworks implement the following source protection measures.

- ✓ Work with Abington, Rockland, Pembroke and Whitman to control residential growth on undeveloped land.
- ✓ Educate residents, especially those abutting Great Sandy Bottom Pond, and businesses about their role in drinking water protection.
- ✓ Maintain water supply awareness signs along roads in the Zone II and watersheds.
- ✓ Discourage birds from lingering at the reservoir.
- ✓ Continue with work to plan for emergencies, including spills.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watersheds.
- ✓ Work with Whitman to monitor solid waste at DPW yard.
- ✓ Replace the underground fuel oil tank at the wells with an alternative fuel source when one is available at that site.
- ✓ Develop and implement a protection plan. DEP guidance to develop plans is available at http://mass.gov/dep/brp/dws/protect.htm.
- ✓ Hire a staff person to coordinate and conduct wellhead and watershed protection work.

Section 5: Additional Resources Available for Source Water Protection

DEP staff, informational documents and resources are available to help build on this SWAP report and to help improve drinking water protection.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the attached GIS map and site specific information is available in Appendix C.

Section 6: Appendices

A. Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
B. List of Regulated Facilities.
C. Table of Tier Classified Oil and/or Hazardous Material Sites.

For More Information

www.state.ma.us/dep
The following DEP staff can be contacted for more information and assistance on improving watershed protection.
Mike Quink, 508-946-2766, DEP's Southeast Regional office
Kathy Romero, 617-292-5727, DEP's Boston office

Additional Documents:

To help with source protection efforts, more information is available by request or online at 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 Mike Quink in DEP's Lakeville office at (508) 946-2766 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
Zone I and Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	**NO** 01G-04G	Monitor Zone I activities.
	NO 01S-02S	Monitor Zone A activities. See 310 CMR 22.20B for Zone A restrictions.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	**YES**	Water supply awareness signs should be posted along roads in the Zone II and watersheds. Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	**YES**	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	**NO** 01G-04G	Monitor Zone I activities.
Municipal Controls (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) ?	**NO**	Work with local 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 mass.gov/dep/brp/dws/ for model bylaws, health regulations, and current state regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	**YES**	Stay aware of proposed development in the watersheds and Zone II and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a local surface water and wellhead protection plan?	**NO**	Develop surface water and wellhead protection plans. Follow *Developing a Local Wellhead Protection Plan* and *Developing a Local Surface Water Supply 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**	Augment plan 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.
Does the municipality have a water supply protection committee?	**NO**	Encourage the formation of a committee to include representatives from citizens' groups, neighboring communities 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 water supply protection education?	**YES**	Continue to educate residents about their role in drinking water protection. Appendix A contains the fact sheet *Residents Protect Drinking Water.*