Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for

Brockton Water System

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	Brockton Water System
PWS Address	39 Montauk Road
City/Town	Brockton, MA 02301
PWS ID Number	4044000
Local Contact	Brian M. Creedon, Manager
Phone Number	508-580-7825

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.

What is a Protection Area?

Reservoirs

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.

Wells

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

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

IWPA: is the larger area that is likely to contribute water to the well.

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

Section 1: Description of the Water System

Ground Water Sources	*Susceptibility: High*
Source Name	***Source ID #***
Hubbard Street well (inactive)	4044000-01G
Surface Water Sources	***Susceptibility: High***
Source Name	***Source ID #***
Silver Lake	4044000-01S
Brockton Reservoir	4044000-02S

Brockton has two active drinking water reservoirs and one inactive drinking water well.

Silver Lake is located in Pembroke, Hympton and Kingston. Its watershed is located in those communities and in Halifax. Brockton Reservoir is located in Avon. The watershed extends into Brockton, Avon and Stoughton. Monponsett Pond and Furnace Pond are considered tributaries to Silver Lake. The inactive well and its Interim Wellhead Protection Area (IWPA) is located in Brockton.

It is a challenge to protect sources that are located in communities other than the community being served. The Brockton Water System is commended for taking an active role in implementing source protection measures.

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 watersheds for the Brockton Water System are primarily a mix of undeveloped forest (42% for Silver Lake, 38% for Brockton Reservoir), residential development (23% and 14%), agriculture, industry (18% for Brockton Reservoir), commercial uses and protected open space. The IWPA contains predominantly residential (35%), commercial (21%) and industrial (8%) uses, with some forest.

A Geographic Information Systems (GIS) map showing the watershed boundaries, Zone I, IWPA, 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 Brockton Water System. 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.

Key Land Uses and Protection Issues Include:

1. Residential Land Uses
2. Transportation Corridors
3. Transmission Lines
4. Chemical Storage
5. Industrial Facilities (including a Large Quantity Toxic User & Large Quantity Hazardous Waste Generators)
6. Oil or Hazardous Material Release Sites
7. Wastewater Treatment Plant with NPDES Major Discharges
8. Hazardous Waste Treatment, Storage and/or Disposal Facility
9. Active Aboveground and Underground Storage Tanks
10. Agriculture
11. Aquatic Wildlife
12. Department of Public Works Facility
13. Golf Course

1. <u>Residential Land Uses</u> – About 23% of the watershed for Silver Lake and 14% of the watershed for Brockton Reservoir consist of residential development. Both watersheds have large amounts of 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. Many septic systems are located around Monponsett Pond. 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.

Residential Land Use Recommendations:

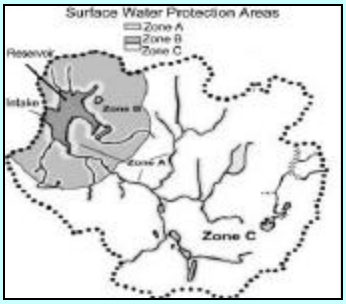
- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents 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.
- ✓ Work with town boards to review and provide recommendations on proposed watershed development.
- ✓ Install a sewer collection system around Monponsett Pond.

2. <u>Transportation Corridors (paved and unpaved local roads & highways)</u> are located near the reservoirs, throughout the watersheds, and within the IWPA. A major highway interchange of Route 24 is located directly upstream of Brockton Reservoir and crosses over a tributary to the reservoir. Spills from vehicular accidents are a major concern. In addition, road salt, 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. The Water System Manager intends to pursue low salt use on Route 24.

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.

What is a Watershed?

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



Transportation 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.
- ✓ Conduct an emergency drill to be ready for spills.
- ✓ Regularly inspect the watershed and IWPA 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.
- ✓ Continue with plan to pursue low salt use on Route 24.

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 (herbicide application) - Transmission lines run through the watersheds. 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 Recommendation:

- ✓ Monitor the YOP for pesticide applications.

4. Chemical Storage - Chemicals are stored at commercial and industrial facilities within the watershed of Brockton Reservoir and within the IWPA.

Chemical Storage Recommendation:

- ✓ Encourage facility owners/operators to provide sufficient secondary containment to control spills.

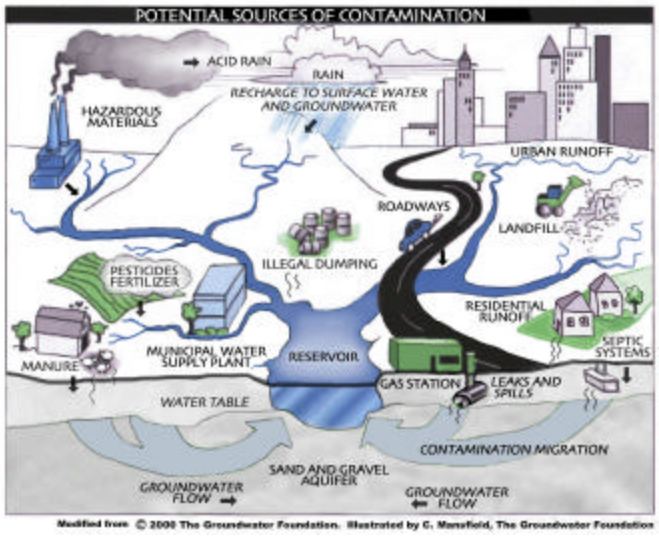


Figure 1: Sample watershed with examples of potential sources of contamination

5. Industrial Facilities - including a Large Quantity Toxic User (LQTU) and Large Quantity Generators of Hazardous Waste (LQG) - There are industrial facilities within the watershed of Brockton Reservoir and within the IWPA. There is an LQTU and LQGs within the watershed of Brockton Reservoir and an LQG within the IWPA. Chemical use, handling and storage is a concern, as well as the handling, storage and disposal of hazardous waste.

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 hazardous waste.

6. Oil or Hazardous Material Release Sites – There are nine DEP Tier Classified Oil or Hazardous Material Release Sites located within the watersheds and the IWPA. Refer to the attached

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	-	02S	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	-	02S	leaks, spills, improper handling, or over-application of pesticides
Residential					
Fuel Oil Storage (at residences)	Numerous	M/M	01G	01S	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M/M	01G	01S	over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Numerous	M/M	01G	01S	microbial contaminants, improper disposal of hazardous chemicals
Commercial					
Golf Course	1	M	01G	-	improper handling or over-application of fertilizers or pesticides
Industrial					
Industrial Facilities, including a Large Quantity Toxic User & Large Quantity Generators of Hazardous Waste	numerous industries, 1 LQTU (02S), 4 LQGs (1-01G; 3 - 02S)	H/H	01G	02S	spills, leaks or other releases of chemicals or metals; improper storage or handling
Wastewater Treatment Plant with Major NPDES Discharges	1 plant; 2 discharges	M	01G	-	spills or leaks from improper handling, storage or disposal of wastewater and treatment 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 so urces, 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	-	01-02S	microbial contaminants
Transportation Corridors	Numerous	M/H	01G	01-02S	leaks or spills of fuels and other hazardous materials; salt; over-application or improper handling of pesticides; erosion from construction
Transmission Lines	1	H	-	01-02S	spills from over-application or improper handling of pesticides; erosion from construction
Chemical Storage at Commercial Facilities	Few	H/H	01G	02S	spills, leaks, or improper handling or storage of chemicals
DEP Tier Classified Oil or Hazardous Materials Release Sites	5/1/3	not ranked	01G	01-02S	see Appendix C for more information
Hazardous Waste Treatment, Storage and/or Disposal Facility (TSDF)	1	H	-	02S	spills, leaks of hazardous wastes
Active Above & Underground Storage Tanks	3/5	M/M; H/M	01G	02S	spills, leaks of stored materials
Road & Maintenance Depot	1	M	-	02S	spills and leaks from the use and storage of sand, salt, gasoline and 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.
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GIS map and Appendix C for more information.

Oil/Hazardous Waste Recommendation:

✓ Educate 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.

7. Wastewater Treatment Plant with NPDES Major Discharges - There is a wastewater treatment plant within the IWPA. There are two NPDES discharges associated with this facility.

Treatment Plant/NPDES Recommendation:

✓ Ask to be contacted by the facility operator in the case of spills or unexpected releases of wastewater or chemicals.

8. Hazardous Waste Treatment, Storage and/or Disposal Facility (TSDF) - There is a TSDF within the watershed of Brockton Reservoir.

TSDF Recommendation:

✓ Ask to be contacted by the facility operator in the case of spills or unexpected releases of hazardous wastes or chemicals.

9. Active Above and Underground Storage Tanks - There are above and underground storage tanks located within the watershed of Brockton Reservoir and within the IWPA.

UST Recommendation:

✓ Encourage the owners of the tanks to install secondary containment to control spills.

10. Agriculture – Cranberry bogs are located within the watershed of Silver Lake. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. 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 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.

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.

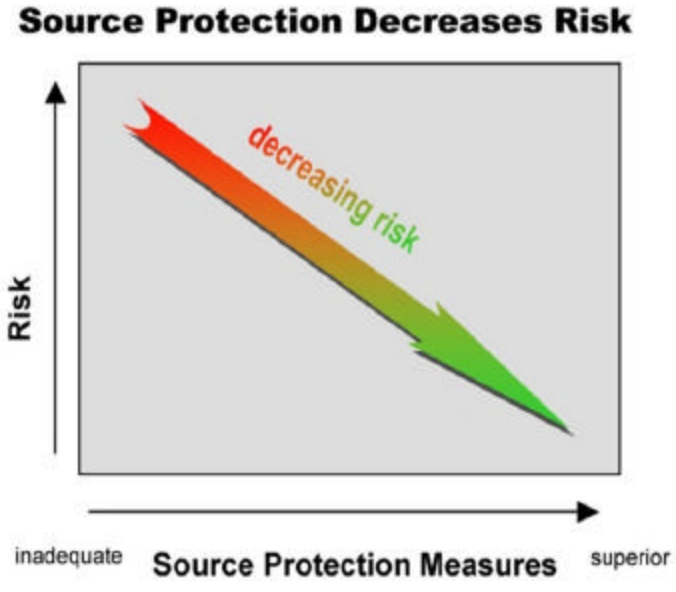

Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

11. 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*.

Aquatic Wildlife Recommendation:

- ✓ Monitor wildlife populations, including beaver, in and around the reservoirs. Discourage feeding of geese and other waterfowl.

12. Department of Public Works (DPW) Facility - Pembroke's (DPW) yard is located within the watershed of Brockton Reservoir. Salt, sand and gasoline can be used or stored at these facilities.

DPW Recommendations:

- ✓ See Appendix A for *DPWs Protect Drinking Water*.
- ✓ Maintain contact with Pembroke's DPW about protection measures and emergency response.

13. Golf Course - There is a golf course located partially within the IWPA. Pesticide and fertilizer spills or over-applications and chemical spills are a concern.

Golf Course Recommendation:

- ✓ Work with the owner/operator of the golf course to encourage the implementation of source protection measures, such as: establishing vegetated buffers to control runoff; minimizing pesticide and fertilizer use; adhering to DEP policy on vehicle washing; and properly storing chemicals.

Section 3: Source Water Protection

As with many water supply protection areas, this system's watersheds and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

The Brockton Water System is commended for taking an active role in implementing source protection measures. Examples of their good work include the following.

Watershed Control

The City owns or controls a significant amount of the watershed lands. The Water Systems Manager has a good knowledge of, and stays aware of, conditions within the IWPA and the watersheds. In December 2001, the Water Systems Manager sent local officials in the watershed communities letters requesting to be notified about proposals for new and expanding development.

Water Supply Education

The Water Systems Manager conducts educational programs and works with community groups to promote water supply protection and water conservation.

SECTION 4: SOURCE WATER PROTECTION RECOMMENDATIONS

DEP recommends that the Brockton Water System implement the following source protection measures.

- ✓ Work with local officials to control residential growth on undeveloped land.
- ✓ Continue to educate residents about their role in drinking water protection.
- ✓ Post water supply awareness signs along roads in the watersheds.
- ✓ Discourage birds from lingering at Silver Lake and Brockton Reservoir and look for the presence of beaver.
- ✓ Continue to communicate with watershed communities about protection measures and emergency response.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watersheds.
- ✓ Encourage regular street sweeping in the watershed communities.
- ✓ Conduct regular inspections of watershed areas.
- ✓ Continue with plan to pursue low salt use on Route 24.
- ✓ Install a sewer collection system around Monponsett Pond.

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, Businesses 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	Comments/Recommendations
Zone I and Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	**NO** Zone I	Monitor activities within the Zone I.
	NO Zone A	Monitor Zone A activities. See 310 CMR 22.20B for Zone A restrictions.
Are the watersheds posted with Public Drinking Water Supply signs?	**YES**	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**	Monitor activities within the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C(2) and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	**NO**	Refer to 310 CMR 22.21(2), 310 CMR 22.20C(2), and 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?	**NO**	Stay aware of proposed development in the watersheds and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a local surface water protection plan?	**A surface water plan for Monponsett Pond is under development.**	Develop a plan for Silver Lake.
Does the PWS have a formal Emergency Response Plan to deal with spills or other emergencies?	**A plan is under development.**	Brockton has a hazardous materials crew that also serves surrounding communities.
Does the municipality have a water supply protection committee?	**NO**	The Water System Manager works with community groups to promote water supply awareness and protection.
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 and businesses about their role in drinking water protection. Appendix A contains the fact sheets *Residents Protect Drinking Water* and *Businesses Protect Drinking Water*.