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

Gloucester Water Division

What is SWAP?

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

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

Susceptibility and Water Quality

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

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

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

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

Table 1: Public Water System Information

PWS Name	Gloucester Water and Sewer Division
PWS Address	Poplar Street
City/Town	Gloucester, Massachusetts 01930
PWS ID Number	3107000
Local Contact	Christine Millhouse
Phone Number	(978) 281-9792

Introduction

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

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

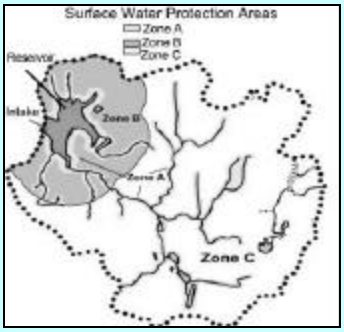
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

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

What is a Watershed?

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



Section 1: Description of the Water System

Surface Water Sources

Source Name	*Source ID #*	*Susceptibility*
Babson Reservoir	3107000-01S	High
Haskell Reservoir	3107000-02S	Medium
Wallace Reservoir	3107000-03S	Medium
Dykes Meadow Reser-	3107000-04S	Low
Goose Cove Reservoir	3107000-07S	Medium

The reservoirs for the Gloucester Water Division are located within five separate water supply protection areas, with a portion of Babson Reservoir's extending into the town of Rockport. Gloucester hopes to upgrade Klondike Quarry Reservoir, which is presently an emergency source, to active use.

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

Section 2: Land Uses in the Protection Areas

The Zone Cs for Gloucester are primarily a mixture of forest and residential, with a small portion of the Zone C for Babson Reservoir consisting of 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. Activities in Zone A
2. Local Businesses
3. Residential Land Uses
4. Comprehensive Surface Water Protection Planning

The ranking of susceptibility to contamination for Babson Reservoir Zone C is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2; the ranking of susceptibility to contamination for Haskell Reservoir, Wallace Reservoir, and Goose Cove Reservoir Zone Cs is medium, based on the presence of at least one medium threat land use within the water supply protection areas, as seen in Table 2; and, the ranking of susceptibility to contamination for Dykes Meadow Reservoir is low, based on low threat land uses within the water supply protection area.

1. Activities in Zone A - Existing and future land use activities which may have an impact on surface water sources include: on-site septic systems; public and private recreational activities; untreated stormwater runoff; domestic animals; new construction; spills along roads; above ground and underground storage tanks; erosion; and un-permitted and unauthorized activities. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following activities occur in the Zone A of the system's reservoirs:

Babson Reservoir - Railroad tracks associated with the commuter rail run from the northeast to the southwest portion of the Zone A for Babson Reservoir.

Glossary
Protection Zones

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

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

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

The attached map shows Zone A and your watershed boundary.

Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals. In addition to the railroad tracks, there is an underground storage tank (UST) that contains fuel oil. USTs can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Haskell Reservoir - Route 128 runs from the northeast to the southwest portion of the Zone A for Haskell Reservoir. 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. De-icing salt washes off into stormdrains or onto adjacent ground. In addition, roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

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.

Wallace and Goose Cove Reservoirs - There are houses on private septic systems located in the Zone A for both Wallace and Goose Cove Reservoirs. Common potential sources of contamination include those associated with septic systems, household hazardous materials, heating oil storage, and stormwater.

Zone A Recommendations:

- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. Work to better manage stormwater by pre-treating contaminated stormwater and/or redirecting stormwater outside of the Zone A.

2. Local Businesses – Because many small businesses and industries use hazardous materials, produce hazardous waste products, and often store large quantities of petroleum products, there is the potential for degrading water quality. Educating the business community about drinking water protection, and encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

Local Businesses - Recommendations:

- ✓ **Hazardous Materials Program Best Management Practices** - Support the development and implementation of a hazardous materials program that includes an Ordinance or Health Regulation. Such a program educates businesses on hazardous material management requirements, explicitly informs the business community what is expected of them, and decreases the potential future liability businesses may be unknowingly creating for themselves. A local program lets the town serve as a consultant, helping businesses protect themselves. See DEP's website for additional information on developing a program for hazardous materials management at http://www.state.ma.us/dep/brp/dws/files/hazmat.doc.

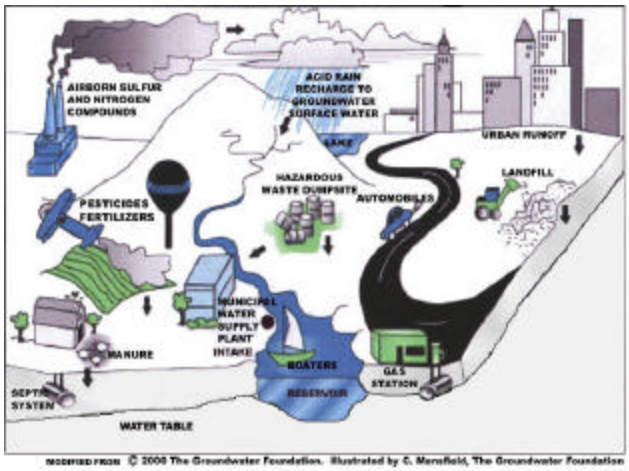


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ **Inspection Program** – Coordinate efforts with local officials in the development and implementation of an Inspection Program to prevent hazardous substances from entering water supplies. Inspections target facilities that generate, use, store, or disposal of hazardous/toxic materials. Programs can also include floor drain and underground storage tanks inspections. Local inspection programs often provide educational material and technical assistance on Best Management Practices. Building Inspectors are often involved in local inspection programs.
- ✓ **Hazardous Materials Best Management Practices** - Work with local businesses to encourage training on proper hazardous material use, disposal, and emergency response. Refer to the attached list of resources for more information on hazardous material BMPs.

- ✓ **Storage Tanks** - Support your local fire department in upgrading all above and below ground oil/hazardous material storage tanks in order to meet current construction standards. Funding for replacing underground storage tanks is available through the MA Department of Revenue. For more information, refer to http://www.dor.state.ma.us/ust/ust_home.htm
- ✓ **Register Hazardous Waste Generators** - Work with local businesses to register with DEP those facilities that are unregistered generators of hazardous waste or waste oil.
- ✓ **Monitor Land Uses** - Work with the Selectmen, Board of Health and Planning Board to monitor land uses within and proximal to the Zone A and Zone C. Refer to the Developing a Local Surface Water Supply Protection Plan guidance at http://www.state.ma.us/dep/brp/dws/protect.htm for types of activities that should be prohibited and managed in the vicinity of public or private water supplies.
- ✓ **Lawn care and Landscaping** - Encourage local businesses to incorporate Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides. For more information, refer to http://www.massdfa.org/pesticides/publications/IPM_kit_for_bldg_mgrs.pdf

3. Residential Land Uses – Approximately 3% of the combined Zone Cs consist of residential areas, of which ninety-nine percent is served by municipal sewering, with the remainder being private 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.

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.

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

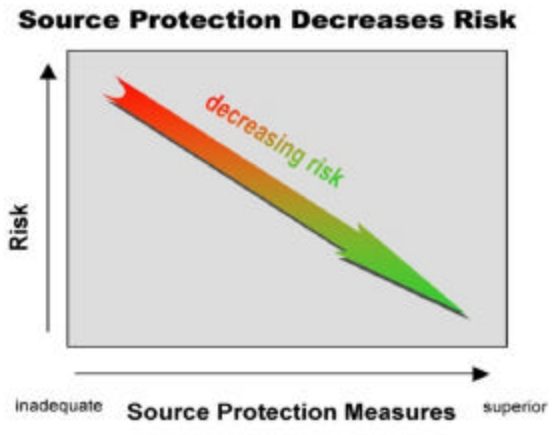


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

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.

Residential Land Use Recommendations (continued):

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

4. Protection Planning – The City of Gloucester has water supply protection controls that are implemented through a Watershed Protection Overlay District Ordinance. Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir.

Potential Source of Contamination vs. Actual Contamination

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

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

Table 2: Land Use in the Watershed

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

Land Uses	Quantity	Threat	Zone C Source ID #	Potential Contaminant Sources*
Commercial				
Medical Facilities	1	M	01S	Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Railroad Tracks And Yards	1	H	01S	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Industrial				
Hazardous Materials Storage	1	H	01S	Spills, leaks, or improper handling or storage of hazardous materials
Industry/Industrial Parks	1	H	01S	Spills, leaks, or improper handling or storage of industrial chemicals and metals
Residential				
Fuel Oil Storage (at residences)	Numerous	M	01S, 03S, 07S	Spills, leaks, or improper handling of fuel oil
Lawn Care/ Gardening	Numerous	M	01S, 03S, 07S	Over-application or improper storage and disposal of pesticides
Septic Systems/ Cesspools	Several	M	03S, 07S	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous				
Aquatic Wildlife	Numerous	L	01S, 07S	Microbial contaminants
Small quantity hazardous waste generators	2	M	01S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Numerous	L	01S, 02S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	2	M	01S, 02S	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	1	H	01S	Spills, leaks, or improper handling of stored materials
Utility Substation Transformers	1	L	01S	Spills, leaks, or improper handling of chemicals and other materials including PCBs

Land Uses	Quantity	Threat	Zone C Source ID #	Potential Contaminant Sources*
Miscellaneous				
Very Small Quantity Hazardous Waste Generator	2	L	01S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Water Treatment Sludge Lagoon	1	M	01S	Improper management of sludge and wastewater

Notes:

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

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

A Water Resource Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supplies.

Protection Planning Recommendations:

- ✓ Develop a Watershed Protection Plan. Establish a protection team, and refer them to http://mass.gov/dep/brp/dws/protect.htm for a copy of DEP's guidance, "Developing a Local Surface Water Supply Protection Plan".
- ✓ Coordinate efforts with local officials to compare local surface water protection controls with current MA Surface Water Supply Protection Regulations 310 CMR 22.20B and 310 CMR 22.20C. If local controls do not meet the current regulations, amend existing controls to meet 310 CMR 22.20B and 310 CMR 22.20C. For more information on DEP land use controls see http://mass.gov /dep/brp/dws/protect.htm.

Other land uses and activities within the and Zone Cs that are potential sources of contamination are included in Table 2. Refer to Appendix A 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.

Top 5 Reasons to Develop a Local Surface Water Protection Plan

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased monitoring and treatment
- Water supply clean up and remediation
- Replacing a water supply
- Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

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 Cs 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:

- Owning or controlling ninety percent of the Zone A of the combined sources.
- Adopting local land use controls for surface water protection. Local controls include: a Watershed Protection Overlay District Ordinance; hazardous materials controls; inspections of industrial facilities by the fire department; and, conducting regular inspections of the Zone A and watersheds

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ 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 As and Zone Cs, and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Surface Water Protection Plan.

Additional Documents:

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

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

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

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

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

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

Section 4: Appendices

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

For More Information

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

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

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	**Approximately 90% of the combined Zone As is owned or controlled**	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone A requirements.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	**YES**	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	**YES**	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	**YES** (Dykes Meadow Reservoir)	Continue monitoring for non-water supply activities in Zone As.
	NO (Babson, Haskell, Wallace, and Goose Cove Reservoirs)	Monitor prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	**POSSIBLY**	Work with the Planning Board and the City Council to review the existing Watershed Protection Overlay District Ordinance to determine if it meets land use controls required by 310 CMR 22.20B & C. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	**NO**	Work with Rockport to include Gloucester's watershed in their protection controls.
Planning		
Does the PWS have a local surface water protection plan?	**NO**	Develop a surface water supply protection plan. Follow "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**	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	**NO**	Establish a committee with representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	**Fire Department**	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 watershed protection education?	**SOME**	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone C.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN GLOUCESTER WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
207648	BATTENFIELD GLOUCESTER ENGINEERING CO.	11 DORY ROAD	GLOUCESTER	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
207648	BATTENFIELD GLOUCESTER ENGINEERING CO.	11 DORY ROAD	GLOUCESTER	HANDLER	SMALL QUANTITY GENERATOR
135145	VARIAN EXTRION	4 BLACKBURN CENTER	GLOUCESTER	HANDLER	RECYCLER – BURNER/BLENDER
135145	VARIAN EXTRION	4 BLACKBURN CENTER	GLOUCESTER	HANDLER	VERY SMALL QUANTITY GENERATOR
135145	VARIAN ION IMPLANT SYSTEMS	BLACKBURN INDUSTRIAL PARK	GLOUCESTER	HANDLER	SMALL QUANTITY GENERATOR

Underground Storage Tanks

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
OMNI-WAVE ELECTRONICS CORPORATION	BLACKBURN INDUSTRIAL PARK	GLOUCESTER	MANUFACTURER	10000	FUEL OIL

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

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