



# West Boylston Water District Source Water Protection Plan

March 2011

Prepared by:



Prepared for:

**West Boylston Water District**

**Oakland Well 01G**

**Lee Street Well 04G**

**Pleasant Valley Well 05G**

*The cover page for the **Rutland Source Water Protection Plan** is a picture taken by **Adam Hart-Davis** of the DHD Multimedia Gallery titled “Tap with Water Flowing”.*

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"There shall be no man or woman dare to wash any unclean linen, wash clothes,...nor rinse or make clean any kettle, pot, or pan or any suchlike vessel within twenty feet of the old well or new pump. Nor shall anyone aforesaid, within less than a quarter mile of the fort, dare to do the necessities of nature, since by these unmanly, slothful, and loathsome immodesties, the whole fort may be choked and poisoned."

*--Governor Gage of Virginia, Proclamation for Jamestown, Va. (1610)*

"Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land."

*Luna Leopold, Hydrogeologist University of California, Berkley*

"When the well is dry, we know the worth of water."

*Benjamin Franklin, (1706-1790), Poor Richard's Almanac, 1746*





***Review Annually and Update Every 3 Years***

Date Reviewed	Reviewer	Changes or Comments

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*Access Road to Pleasant Valley Well  
04G.*

## Source Water Protection Plan Steering Committee

The Source Water Protection Plan Steering Committee provided background information about West Boylston's water supply and its watershed, and assisted in the development of protection strategies. Members of the Advisory Committee include:

Michael Coveney, Superintendent – West Boylston Water District  
Beverly Salate – West Boylston Board of Health  
John O'Brian – West Boylston Select Board

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## **Introduction**

### **Source Water Protection Plan**

A Source Water Protection Plan (SWPP) identifies water system vulnerabilities to contamination and describes techniques to manage potentially contaminating land uses. The West Boylston Source Water Protection Plan has been developed by the West Boylston Source Water Protection Steering Committee and MassRWA to aid in the protection of the public water system (PWS) for West Boylston's Wellfields.

Public water suppliers around the state of Massachusetts and across the nation are increasingly finding that proactive planning and prevention are essential to both the long-term integrity of their water systems and limitation of their costs and liabilities. Despite our best efforts, accidental spills of hazardous chemicals are all too common and bacterial outbreaks still occur unexpectedly, sometimes with dangerous consequences. These types of events may result in costly treatment, remediation and/or litigation, and in worst-case scenario could permanently destroy a water source or injure/kill a water customer.

According to the National Center for Small Communities (2000), successful planning and prevention requires six basic steps:

1. Source protection area (SPA) delineation;
2. Identification of sources of contamination within SPA's;
3. Assessment of the risks to drinking water posed by contaminant sources;
4. Publication of the risk assessment results'
5. Implementation of measures to manage contaminant sources; and
6. Contingency planning for response to contamination incidents.

Source protection planning has numerous benefits including:

- Increasing consumer confidence that their drinking water source will continue to be protected and reliable;
- Reducing the likelihood that contamination incidents will occur with costly and/or potentially harmful results;
- Relationships with regulatory agencies, employees and the public are often enhanced through source protection
- Source Protection Plan's provide strong support to requests for financial assistance.

## Action Plan

ACTION	WHO	WHEN
1. Work with the town officials of West Boylston and the DCR to continue to protect the Zone I and II utilizing an Aquifer and Watershed Protection District Bylaw.	WD. DCR	2011
2. Acquire available funds for land purchase and all other implementation strategies using the <b>West Boylston Source Water Protection Plan</b> as water resource management tool required by the <b>Commonwealth Capital</b> funding process.	SB, WD	2011
3. Conduct educational outreach to businesses and residents in West Boylston's Zone II to inform them of the contamination threats to public water supplies.	WD	2011
4. Conduct educational outreach to septic system users in the Zone II to inform them about proper septic maintenance.	WD	2011
5. Inform septic system users on how to obtain group rates for pumping residential septic systems.	WD	2011
6. Continue to negotiate buying or protecting priority parcels within the Zone II.	WD, SB	2011

### West Boylston Open Space Plan

The West Boylston Open Space Plan updated in 2009 specifically addresses and makes recommendations for the preservation and protection of the Town's drinking water supplies. These include examining the critical environmental issues surrounding West Boylston's drinking water supplies and the significance of protection open space near existing and potential town water supplies. The West Boylston Open Space Plan (updates 2009) sections relevant to the West Boylston Source Water Protection Plan will be included in the document to further support each of the plans goals and objectives.

### EOEA Water Assets Study Community Report

In 2004, Earth Tech completed a Water Assets Study for the Town West Boylston with the assistance of Mike Coveney, Superintendent of the West Boylston Water District.

The Water Assets Study is expected to benefit municipalities by:

- Helping communities protect existing water supplies and identify land that may be critical for future supplies
- Raising public awareness of current and future pressures on water resources
- Fostering intra-municipal communication on water resources issues
- Raising local support to conserve water and protect water-supply areas (Zone II's and Zone B's)
- Helping determine whether each community has sufficient supply – both current and future – to meet its long-term demand.

For the Commonwealth, the Water Assets Study is expected to:

- Assess whether the existing water-supply infrastructure in the study area is adequate to meet current and future demands
- Identify critical "hot spots" where demand might exceed sustainable supplies
- Identify potential water-conservation and regional cooperation strategies that would help protect essential ecosystems, while still meeting human water demands.

## **Description of Water Supply**

### **Regional Context**

West Boylston is a small residential suburb of Worcester, Massachusetts, the second largest city in New England. It is located in central Massachusetts, north of Worcester, west of Boylston, south of Sterling and east of Holden. Although often referred to as a "bedroom community" of Worcester, West Boylston has approximately 300 businesses including retail, service, and light manufacturing companies. Businesses are mainly located on Route 12 and industries are located mainly in the Hartwell Street Industrial Area.

Similar to the five other towns that are within the Wachusett Reservoir Watershed, housing is generally single-family in traditional residential areas and subdivisions. Within this region most retail businesses are located in strip commercial developments or in shopping plazas. The town is accessed by State Routes 12, 140, and 110 as well as Interstate 190. A railway track also traverses the town and is utilized daily for the transport of freight. Most of the town is located in the Wachusett Reservoir's watershed and twenty percent of the Wachusett Reservoir (the Reservoir) is located in West Boylston. The watershed offers beautiful scenery for both residents and visitors and the Reservoir presents a fishing challenge to many sports enthusiasts. Limited types of passive recreation around the Reservoir are popular for the residents and many visitors. Preserved natural areas abound around the Reservoir, but utilization is limited somewhat due to protections necessary for water quality.

### **Watershed Location**

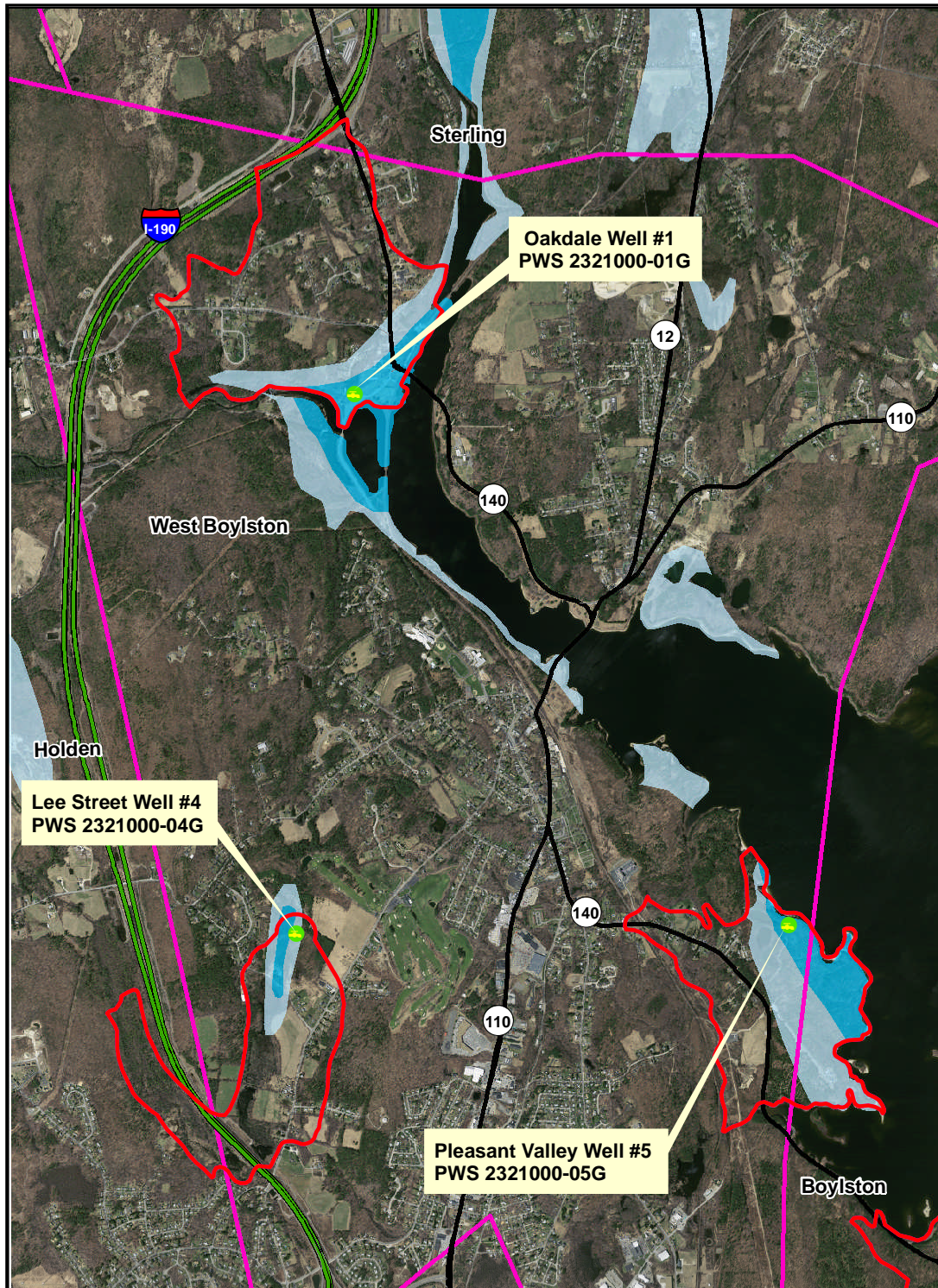
West Boylston, with a total area of 13.8 square miles, is partly in the Blackstone River Watershed and partly in the Nashua River Watershed. 8% of the town's area, representing 1.0 square mile, is in a high stress portion of the Blackstone River Watershed. 92% of the town's area, representing 12.7 square miles, is in a medium stress portion of the Nashua River Watershed. In general terms, the EOEA "stressed watershed" designations refer to broad regions, and reflect the relative quantity of stream flow in these watersheds or sub-watersheds in comparison to other watersheds in the state.

### **Water Resources**

#### **Aquifer Recharge Areas**

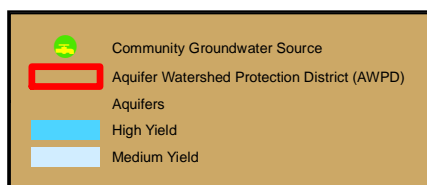
West Boylston contains three significant aquifers, which are all located where the public wells are located in the low-lying sandy deposits. The Quinapoxet River flows into the reservoir at the northwest corner into the Thomas Basin which contains significant deposits of sand and gravel. The Thomas Basin in particular has a high yield aquifer in which the Oakdale Well is located. The second aquifer supplies the Lee Street Well and is much smaller than the Thomas Basin and the Pleasant Valley aquifer. The third aquifer lies along the western shore of Mt. Wachusett Reservoir and supplies the Pleasant Valley well. The map below shows the high yield (flow > 300 gallons per minute) and medium yield (flow 100 – 300 gpm) locations of aquifers in West Boylston.





Scale – 1:30,000

**Map 1: Town of West Boylston Aquifers**



Source(s): MASSGIS Datalayers –Author:RJM Date: 12/10



## Description of Wells

*Table 1: West Boylston Water District Water Sources*

<i>Well Name</i>	<i>Source ID#</i>	<i>Source Susceptibility</i>
Well #1 – Oakdale Well	2321000-01G	High
Well #4 – Lee Street Well	2321000-04G	Moderate
Well #5 – Pleasant Valley Well	2321000-05G	High

### Water Supply

57% of West Boylston's area is served by a single public water supplier, the West Boylston Water District. The West Boylston Water District obtains water from three groundwater sources in West Boylston. The West Boylston Water District services 2500 connections to its finished water.

The raw water is treated for corrosion control with Potassium hydroxides (KOH) and a polyphosphate used as a manganese sequestering system. The biggest users of West Boylston's water are the 18 restaurants and a nursing home. The car wash utilizes its own well, but has a connection to the Water District as a back-up supply. All the businesses and residences are metered (approximately 2/3 are electronically monitored).

Two of the wells, Well #1 Oakdale 01G and Well #5 Pleasant Valley 05G, have problems with manganese. Well 01G has the highest manganese levels at 1.5 milligrams per liter (mg/L), followed by 05G with averages around 0.2 mg/L. All of the wells have above average levels of naturally occurring sodium chloride. The annual averages are: Lee Street 04G – 21.4 mg/L, Oakdale Well 01G – 17.6 and Pleasant Valley 05G – 10.3.

Sodium chloride is presently on the Environmental Protection Agency's (EPA) Drinking Water Contaminant Candidate List (CCL). The CCL is a list of contaminants which, at the time of publication, are not subject to any proposed or promulgated national primary drinking regulation (NPDWR), are known or anticipated to occur in public water systems, and may require regulations under the Safe Drinking Water Act (SDWA). EPA current regulation for sodium chloride is 20 milligrams per liter (mg/l) under the Drinking Water Equivalency Level (DWEL or guidance level) for sodium.

### Well #1 Oakdale Well – 01G

The Oakdale Well is located on the northern shore (Thomas Basin portion) of Mt. Wachusett Reservoir just off Main Street of the Oakdale section of West Boylston. According the Earth Tech Zone II Delineation for the Oakdale Well, the well substrate consists of sand and gravel interpreted to be delta topset beds over forest beds. The Oakdale Well is situated in a lowland valley adjacent to the flat-topped hill on which High Plain Cemetery sits. The cemetery just north of the Oakdale Well has the distinctive shape of a delta.

Based on the record of a 48-hour pumping test conducted in June 1956 soon after the gravel-packed well was completed, the MassDEP has assigned a pumping rate of 725 gallons per minute (gpm) for the Oakdale Well.

The water quality of the Oakdale Well (01G) meets the MassDEP drinking water standards as of January 2011, except for manganese. Manganese is found at concentrations as high as 1.5 mg/L which is well above the 0.05 mg/L. Manganese is not a health concern, but can cause undesirable effects, such as staining of laundered clothes and of plumbing fixtures. Due to the high levels of manganese found in the Oakdale Well and the subsequent treatment costs and difficulties, the West Boylston Water District would like to commission a new wellfield just off of Route 12 and reserve the Oakdale Well for a back-up or emergency supply.

There are also historical concerns with nitrate levels found during past testing periods though no nitrate levels have exceeded the drinking water limit of 10 mg/L. Possible sources of nitrates are septic systems and lawn fertilizers. There are several residences upgradient to the well that may be a non-point source of the elevated nitrates.

#### **Well #4 Lee Street Well – 04G**

Well 04G is located west of Prospect Street and north of Lee Street in a wooded area behind the decommissioned Lee Street Wellfield. The Lee Street Well (04G) installed in 1966, is a 16 by 24-inch gravel packed well at a depth of 56 feet and situated within the Malden Brook Watershed, approximately 350 feet away from Malden Brook. The Malden Brook aquifer consists of 20 to 70 feet of sand and gravel deposited in a glacially carved, bedrock valley. The aquifer is bounded to the east and west by relatively impermeable till deposits. The well delivers water at 250 gallons per minute (gpm) and is considered a high pressure system. Well 04G does not have a problem with manganese or iron, but does have a high naturally occurring sodium level of 21.4 mg/L.

The wellfield just off of Lee Street formally known as Wells #2 and #3 have been decommissioned due to high levels of iron. The iron content in the water caused excessive build-up on the screens in the wells and needed to be cleaned/recommissioned often which became too expensive for the Boylston Water District. All the wells have been sealed with concrete and welded shut. The original pumphouses are still on the property.

#### **Well #5 Pleasant Valley Well – 05G**

The Pleasant Valley Well (05G) is located on the western shore of Mt. Wachusett Reservoir in a wooded area accessed by a dirt one lane road that is gated at Route 140. The deltaic deposits in the area of the well are composed of sand, gravel, boulders and silt. The geologic log for 05G describes 114 feet of predominantly coarse sand and gravel underlain by 10 feet of fine sand and 13 feet of till.

Based on the maximum historical month of pumpage reported to the MassDEP by the West Boylston Water District, the yield of Pleasant Valley Well has been set at 500 gpm. The water quality of the Pleasant Valley well meets drinking water standards. The water does have some manganese (0.2-0.3 mg/L), but is far less than the Oakdale Well. The water is treated for manganese



**Table 2: West Boylston Water District Well Yields/Well Fields**

<b>Well Yields: Well Fields</b>				
Characteristics	Oakdale	Pleasant Valley	Lee Street #4	TOTALS
Size	36" x 24"	24" x 18"	24" x 16"	
Percent of Town Usage	19	47	34	100
Safe Yield (gpm)	2500	800	250	3,550
DEP Permitted Capacity (gpm)	725	500	250	1,475
Pumping Capacity (gpm)	600	500	250	1,350
2007 Total Withdrawal (MGD)	0.11	0.27	0.20	0.58

*Source: West Boylston Open Space Plan/ Update March, 6 2009*

### **Potential Site for New Well Development**

The West Boylston Water District will be developing a new well site near Routes 12 and 110 on a parcel owned by the Massachusetts Department of Conservation and Recreation (DCR). The legislature has approved this site and an easement has been granted. The pump tests for the new wellfield have also been completed and the Water District is preparing to go ahead with the project. This would allow the Oakdale Well 01G to be used only as a back-up or emergency supply due to its high levels of manganese. As of 2011, the West Boylston Water District has 11 test wells at the site off of Rt. 12. The new wellfield's preliminary test results show that the water has no manganese problems, but they are high in sodium (between 18-22 mg/L). The sodium is thought to be naturally occurring, as all the wellfield's in West Boylston have naturally occurring salts. The salt at this site may be exacerbated by road salt due to the proximity of Route 12 to the wellfield. Further testing is necessary to determine the source.



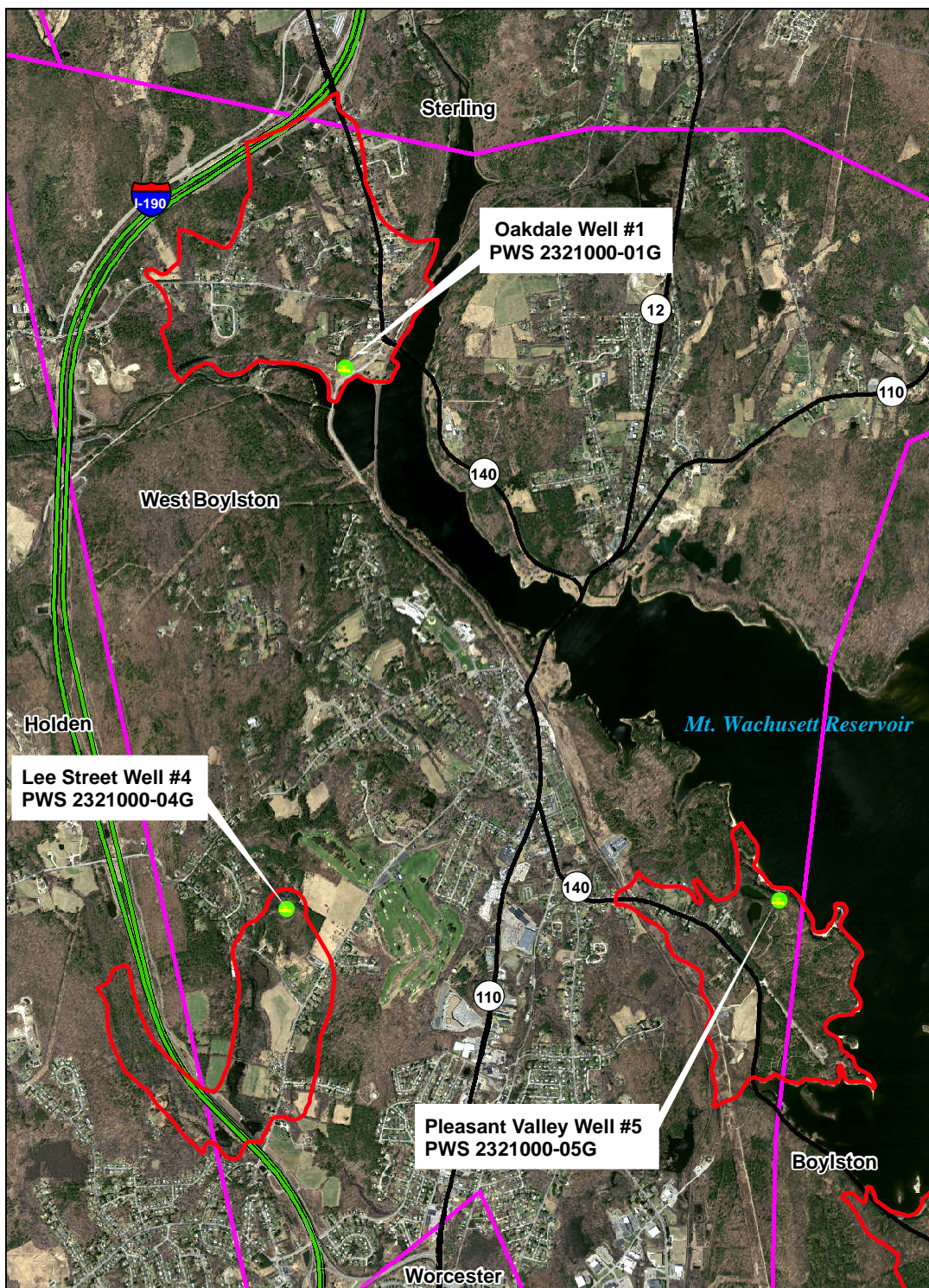
A sand and gravel processing operation, Baldarelli Brothers, Inc., has allowed the Water District an easement road access to the site of the potential new wellfield. The sand and gravel operation no longer actively mines material from the site, but does process material onsite that had been collected from other gravel pits.

*Sand and Gravel processing operation located on Route 12 near the site of a potential new wellfield for the West Boylston Water District.*

The potential physical capacity of these sources is not known. The West Boylston Board of Water Commissioners has decided to go ahead with siting the new wellfield at this location. If the site does not yield a viable source then the West Boylston Water District will be required to build a state of the art manganese treatment plant. There is the option also of finding another location to site a new wellfield and the DCR will need to be consulted. There are no other viable sites located on Town owned land.

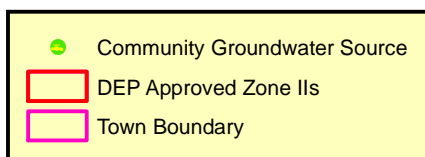
West Boylston also has an agreement that dates to the 19th century allowing withdrawal from the Wachusett Reservoir, which is a potential future source of supply. In 1898, by an Act of the Legislature, the Town of West Boylston is allowed to withdraw not more than 2 million gallons of water a day. The Town of West Boylston would be required to build a water filtration plant to utilize this withdrawal agreement.





Scale – 1:35,000

**Map 2: Map of West Boylston's Wells**



Source(s): MASSGIS Datalayers –Author:RJM Date: 12/10



## Land Use and Potential Sources of Contamination in the West Boylston's Zone II's

Surface and groundwater sources for drinking water may be affected by adjacent or nearby land use activities, which can threaten drinking water quality.

The Massachusetts Department of Environmental Protection (MassDEP) uses hydrogeologic modeling to determine areas of potential impact to drinking water sources, to help

communities and regulators protect such sources. The Code of Massachusetts

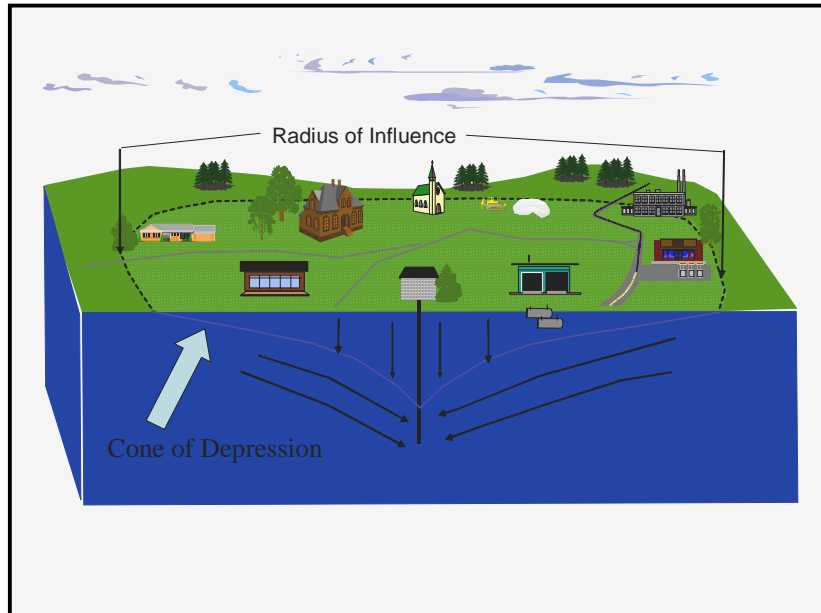
Regulations (CMR) defines a Zone II as

land overlaying that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation) For areas within the Zone II that are already developed, communities can regulate activities that might pose threats to drinking water through general town by-laws and Board of Health regulations. Through its Source Water Assessment Program (SWAP) in the early 2000's, MassDEP identified specific threats to drinking water associated with the developed land within their Zone II's to implement protections against such threats.

Communities can use zoning by-laws or other measures to protect the *undeveloped* areas within Zone II's from *future* activities that may pose a threat to drinking water. In West Boylston, existing Zone II's constitute 3,747 acres, or 42% of the town; 14% of the land within these Zone II's is "developable," based on existing town zoning.

### West Boylston Sewers and Sewage Treatment

According to the West Boylston's 1988 Land Use Plan out of the 1,662 single family housing units in town, 865 (52 percent) were located on lots smaller than 20,000 square feet. Four hundred and twenty-six (25.7 percent) were located on lots 20,000 - 39,999 square feet. Three hundred and seventy-one (22.3 percent) were located on lots 40,000 square feet or larger.



*Radius of influence" means the radial distance from the center of a well bore to the point where there is no lowering of the water table or potentiometric surface (the edge of the well's cone of depression).*



With about half the single family homes located on lots of less than half an acre, septic problems occurred. When septic systems failed on these small lots, there was often no suitable space for constructing a new system. Because these failing septic systems were thought to be polluting the Reservoir's tributaries, the state agreed in 1996 to pay about two-thirds the cost of sewerage for the more densely populated sections of West Boylston. About 50 - 60 per cent of the town's area is sewerage in a project which began in 1996 and was completed in 2005. The availability of sewers has promoted development because land that could not accommodate septic systems could not be developed. Since sewers have become available, this development limitation has been lost.

According to the 2009 update to the West Boylston Open Space Plan, as of January 1, 2008, 1,515 properties have connected to the municipal sewer system. It is estimated that 50-60% of the town's land area is being sewerage. Approximately 56% of the town's population will be switching from septic systems to sewers, according to the 1994 Facilities Plan. This document estimated that 347,737 gallons per day (gpd) of residential wastewater (plus infiltration from ground water) will be going into the sewers. In addition, 134,188 gpd of commercial/industrial wastewater will be discharged to the sewer. All of this wastewater going into the sewers will be piped through Worcester to the Upper Blackstone Water Pollution Abatement District's treatment plant in Millbury. Here, it will be discharged into the Blackstone River, which is more than 8 miles away from West Boylston town wells.

By 2020, it is expected that 587,000 gpd of wastewater (plus ground water infiltration) will be going out of West Boylston. By full build-out in 2050, 614,000 gpd of wastewater will be leaving the watershed via the sewers. It is not know how this water transfer will affect the recharge of West Boylston's wells, groundwater, wetlands and streams as no studies of this inter-basin transfer were done prior to the sewer project's adoption.

According to the 2009 Open Space Plan, the sewer construction has eliminated much of the contamination from failing septic systems, though concerns about well water recharge and build-out in the sewerage areas remain a concern to the West Boylston Open Space Committee.

### **Source Water Assessment and Protection Reports**

To help protect Public Water Systems, the Federal Safe Drinking Water Act Amendments of 1996 (SDWA) require the implementation of a Source Water Assessment Program (SWAP) by each state. The SWAP emphasizes the importance of source water protection as a pollution prevention tool that can be used as part of a comprehensive multi-barrier approach to source water protection. Source water assessments help characterize the susceptibility of public drinking water sources to contamination by summarizing information about the activities and land uses within recharge areas.



As part of the SWAP program, the Massachusetts Department of Environmental Protection (MassDEP) has identified certain land uses within water supply protection areas that may be potential sources of contamination and has delineated Wellhead Protection Areas (areas important for protecting the recharge area) for all Public Water System groundwater sources in Massachusetts.

Wellhead Protection Areas are delineated into Zone I Wellhead Protection Areas (Zone I) and, either Zone II Wellhead Protection Areas (Zone II) or Interim Wellhead Protection Areas (IWPA). The initial buffer around a Public Water System is classified as the Zone I, which is defined as a fixed protective radius around a public water supply well or wellfield. The default Zone I radius is four hundred (400) feet for Community Water System wells, and is one hundred (100) feet for Non-Community Water System wells. Zone II's are defined in the Massachusetts drinking water regulations (MGL 310 CMR 22.02) as: "That area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation)." Zone II delineations require land use, topographic, hydrologic, hydrogeologic and stratigraphic analyses to be approved in Massachusetts.

Wells that do not have approved Zone II delineations are protected by Interim Wellhead Protection Areas. Interim Wellhead Protection Areas require a minimum buffer of four hundred feet and extend to a maximum buffer of 2,640 feet; the buffer is directly proportional to the approved pumping rate of the well.

Common sources of groundwater contamination are leaking underground storage tanks, household hazardous chemicals, stormwater runoff, deicing agents, leaking or malfunctioning septic systems, leaking fuel tanks and/or spills from fluid transfers, and hazardous waste spills during transport or disposal.

Many of the contaminants present in homes, businesses and public buildings served by private or publicly owned wells are often odorless, tasteless, and colorless. The only way to identify their presence is to have the water tested. While owners and operators of Public Water Systems in Massachusetts are subject to stringent reporting and water testing requirements issued by the MassDEP and the EPA, not all contaminants are included in the required tests. Many contaminants, once detected, can be extremely difficult and expensive to remediate and the water source may never again be suitable as a drinking water source.

Furthermore, the EPA states that drinking water may reasonably be expected to contain at least small amounts of some contaminants and sets standards for approximately ninety contaminants in drinking water and lists the contaminants likely source and health effects. Contaminants regulated by the EPA include microbes, radionuclides, inorganic compounds, volatile organic compounds (VOC), synthetic organic compounds (SOC), disinfectants and disinfection byproducts. The sources of these drinking water contaminants range from human and animal fecal waste to fertilizers to simple household cleaners. Individually, these sources of contamination can appear to be insignificant and harmless, but cumulatively, over time, these sources pose a serious risk to the long-term quality of our drinking water sources.

The MassDEP's SWAP Program identified the top five potential sources of contamination to public water sources in Massachusetts as: 1) residential lawn care/gardening; 2) residential septic systems and cesspools; 3) residential fuel oil storage; 4) stormwater discharge; and 5) state-regulated underground storage tanks.

A field survey of land uses and potential contamination sources (PCSs) was carried out by MassRWA during this planning process. The West Boylston Source Water Protection Plan updates the 2002 MassDEP SWAP survey to reflect the state of potential contamination sources present in 2010-2011. A detailed description of potential contamination sources are addressed in this section.

Specific protection strategies and recommendations by the SWAP report and the Source Water Protection Planning Committee will be addressed in detail throughout the West Boylston Source Water Protection Plan.

The following potential sources of contamination, located within the Zone II of the three West Boylston Public Water Sources, were identified as serious threats to the sources by the MassDEP SWAP Program and the West Boylston Source Water Protection Committee during the source water protection planning process. The plan focuses on reducing immediate threats in the Zone I and Zone II of the Source Protection Areas, but also provides strategies for education and outreach for long-term source water sustainability.

(Please see **Resources** for a copy of the West Boylston Water District SWAP report completed February 26, 2002.)

The SWAP report for the West Boylston Water District determined that the overall ranking of source susceptibility for West Boylston's Wellfields are "**High**" for the Oakdale 01G and the Pleasant Valley 015G wells based land uses in the associated Source Protection Area (SPA). Lee Street is ranked as "**Moderate**" in source susceptibility.

The Key issues identified by the SWAP Report and the 2011 West Boylston Source Water Protection Plan include:

1. **Inappropriate Activities in Zone I**
2. **Residential Land Uses**
3. **Transportation Corridors**
4. **Railroads**
5. **Hazardous Materials**
6. **Agricultural Activities**
7. **Beaver Control**

**Table 3: Land Uses in the Water Supply Protection Areas**

Land Uses	Quantity	Threat	Potential Contaminant Sources
<b>Commercial</b>			
Cemetery	1 Oakdale Well	Low (L)	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Nursing Home	1 Oakdale Well	L	Microbial contaminants: improper management
Railroad Tracks And Yards	Oakdale and Pleasant Valley Wells	High (H)	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
<b>Residential</b>			
Fuel Oil Storage (at residences)	Numerous	Medium (M)	Fuel oil: spills, leaks or improper handling
Septic Systems/Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
Lawn Care/Gardening/Hay	Numerous	M	Pesticides: over-application or improper storage and disposal
<b>Miscellaneous</b>			
Aquatic Wildlife - Beaver	Lee Street Well	L	Microbial contaminants
Small quantity hazardous waste generators	1	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Lee Street and Oakdale Well Zone II	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors/ Utility Right of Way	Routes I-190 and 140	M	Fuels and other hazardous materials, accidental leaks or spills, pesticides: over-application or improper handling

Sources: West Boylston Water District SWAP Report, MassDEP, February, 2002; MassRWA-on-site PSOC inventory 2011; West Boylston Water District Zone II Delineation- Oakdale Well-01G, Lee Street Well-04G by Earth Tech, Inc. and Pleasant Valley-05G by Geologic Services Corporation.

### Land Use Oakdale Well – 01G

The Zone II occupies approximately 0.71 square miles and is moderately developed. The SWAP report by the MassDEP rates the source susceptibility of the Oakdale Well as “High”. The most significant development occurs along North Main Street, which is predominantly residential with lesser amounts of commercial and industrial uses. The remainder of Zone II is hilly and heavily wooded, with only six streets and widely spaced older rural and suburban homes.



*The Oakdale Well 01G pumphouse and the Town owned Mass Central Rail Trail that passes near the pumphouse.*

The remainder of Zone II is hilly and heavily wooded, with only six streets and widely spaced older rural and suburban homes. Several ponds and streams are also present.

The Oakdale Well lies about 400 feet from the Bonci-Warren Fire Training Facility (formally the Town brush dump), just south of the High Plain Cemetery and west of a business center. A parking lot and ballfield that once occupied portions of the Zone I have been moved out of the Zone I. The West Boylston Water District reports that the newly sited parking lot is heavily used on weekend for the railtrail that passes within 10 feet of the pumphouse.

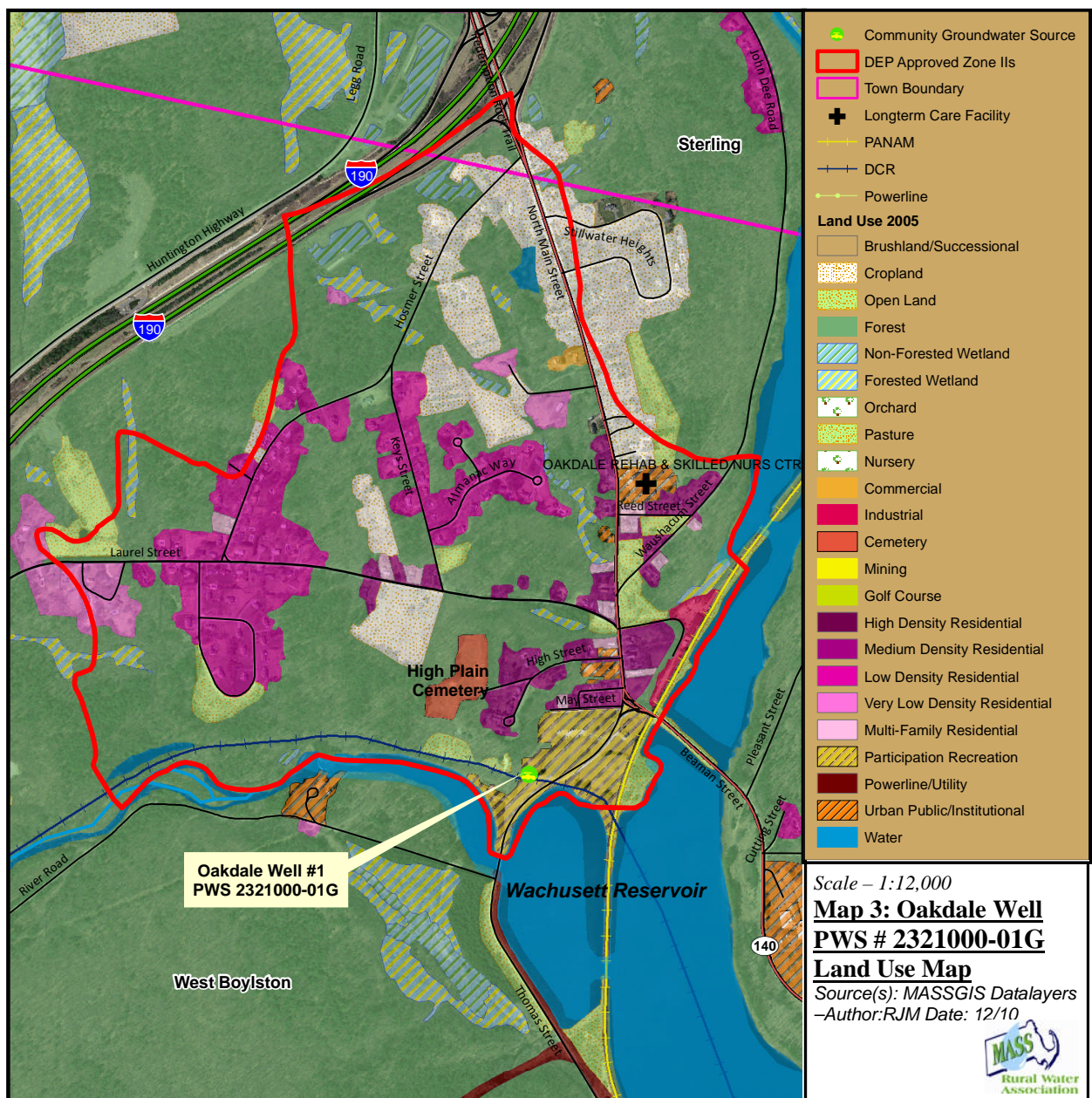
The District also reports former mills (shoe factories) along the Quinapoxet River and Wachusett Reservoir. Interstate Highway I-190 and State Highway 140 are the major thoroughfares in the Zone II. West Boylston currently some areas that have public sewage treatment facilities, but many residences in the Oakdale Zone II do utilize septic systems. Residences are also using home heating oil as a the major source of heat and hot water near the Oakdale Well 01G.

The very northern tip of the Oakdale Well Zone II reaches into the Town of Sterling ending at I-190 and contains mostly agricultural crop fields.

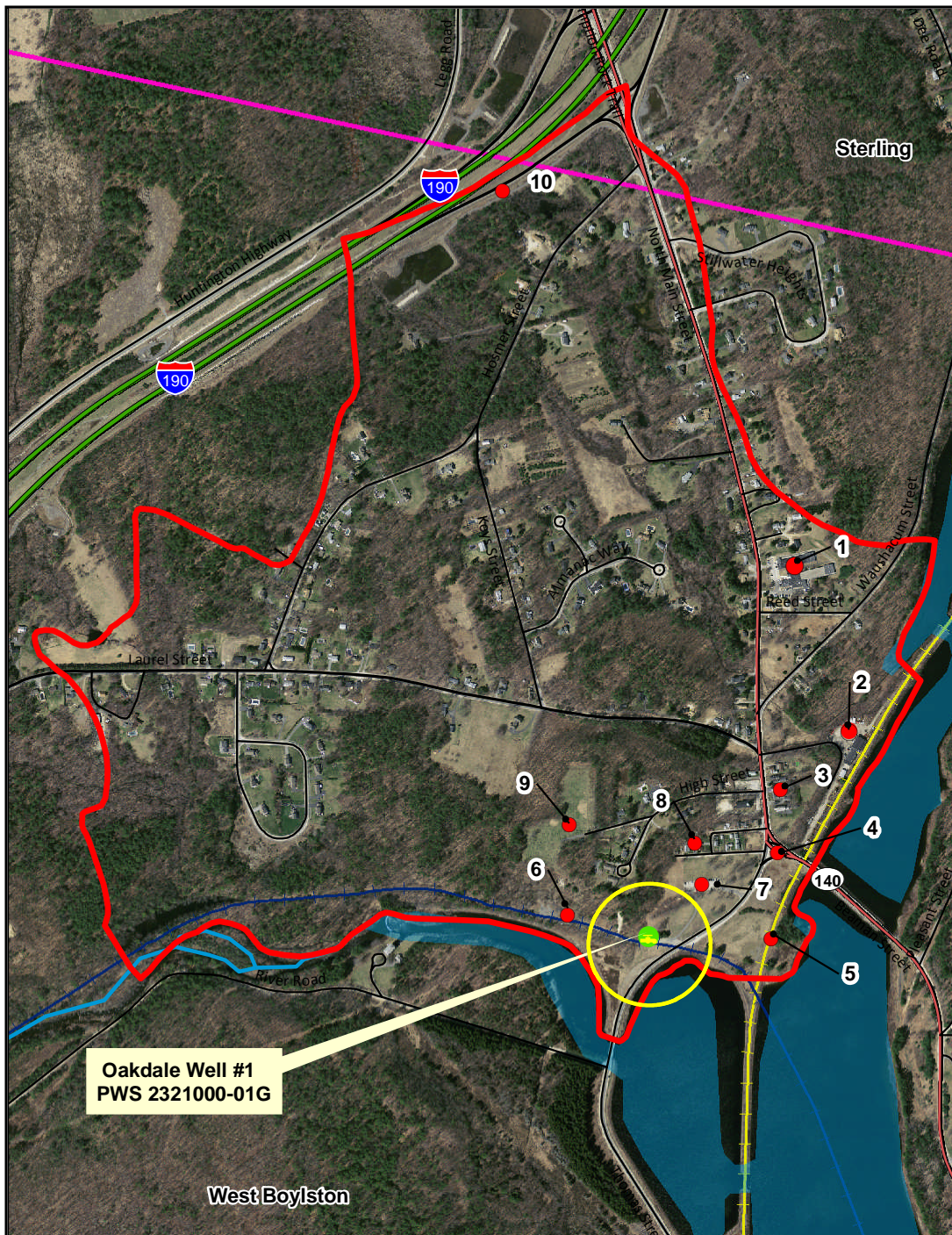


*Entrance to the Mass Central Rail Trail near the Oakdale Well-01G.*



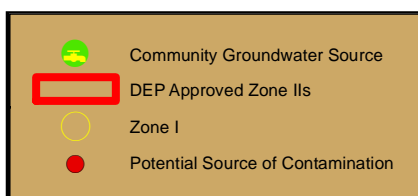






Scale – 1:11,250

#### **Map 4: Potential Sources of Contamination Oakdale Well 01G Zone II**



Source(s): MASSGIS Datalayers –Author:RJM Date: 12/10



## Potential Sources of Contamination Oakdale Well – 01G

**Table 4: Potential Sources of Contamination Oakdale Well -01G**

<b>Potential Sources of Contamination Zone II Oakdale Well 01G West Boylston Water District PSW# 2321000-01G</b>			
<b>Site Number</b>	<b>Name</b>	<b>Potential source of contamination</b>	<b>DEP Risk Category<sup>1</sup></b>
1	Oakdale Rehabilitation and Skilled Nursing Center	Medical hazardous waste <b>UST DFS Facility ID#: 22611</b> There is no info about this UST in the state data base. See Appendix C Fire Dept. reports- 4000gal. install. 12/2007	M = medical waste H=UST
2	Building is vacant, could potentially have a new occupant.	<b>UST DFS Facility ID#: 18008.</b> See Appendix C	H=UST
3	Jacqueline's Hair Salon	Potential hazardous waste from hair treatment	L
4	Transportation corridors/ Route 140 and Main/Thomas Street	Hazardous spills, petro chemical runoff, salt application; Zone I	L
5	Pan Am Railroad corridor	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills	H
6	Bonci-Warren Fire Training Facility	Historical training facility for the fire department	L
7	Wachusett Reservoir Thomas Street Parking Lot	Hazardous spills, petro chemical runoff, salt application	L
8	Residential homes	Septic systems, heating oil, lawn and garden chemicals	M
9	High Plain Cemetery	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids	L
10	Transportation corridor/ Route I-190	Hazardous spills, petro chemical runoff, salt application	L
1 = High (H), Medium (M), or Low (L) threat to groundwater.			

### 21 E Hazardous Spill Oakdale Well 01G

There is one 21 E site (hazardous spills) at the Oakdale Well 01G Pump Station. According to Weston & Sampson's *Response Action Outcome Statement*, the engineering firm responding to the spill, there was a release of mercury at the West Boylston Water District's (WBWD) Oakdale drinking water pump station, located on Thomas Road. The release occurred on November 4, 2002, when WBWD employees investigated a problem with the Oakdale Pump Station's flow meter (a manometer containing elemental mercury). While flushing out the high and low pressure lines leading to the Venturi vpip, the WBWD employees observed an unknown quantity of elemental mercury (silvery beads mixed with water) released to the floor of the pump station's basement.



Mercury was also released into a sink that discharged to a drywell approximately **50** feet west of the building.

Between November 2002 and September 2003, Weston & Sampson performed numerous Immediate Response Action (IRA) activities to address the release, including submittal of an IRA Plan on January 3, 2003, an IRA Status Report on March 3, 2003, and an IRA Completion Report on September 3, 2003. IRA activities performed include: physical recovery of spilled mercury, removal of impacted piping and equipment, decontamination of mercury-impacted surfaces in the building, basement ventilation, excavation and off-Site disposal of approximately 40 cubic yards of mercury-impacted soil, installation of three soil borings/shallow groundwater monitoring wells, and collection of air, soil, and groundwater samples for laboratory analysis. Post-remediation (e.g., following contaminated soil excavation, basement decontamination and ventilation) media sampling indicates the following.

- Post-excavation and soil boring mercury concentrations in soil are below the Method I S-1 standard;
- Groundwater mercury concentrations are non-detect; and,
- Indoor air mercury concentrations are significantly below the National Institute for
- Occupational Safety and Health's (NIOSH) 8-hour time weighted average Permissible Exposure Limit (PEL, 0.05 mg/m<sup>3</sup>).

A Method 3 risk characterization was performed to evaluate potential risk to human health, public welfare, safety and the environment. Potential human receptors evaluated include an onsite indoor worker under current conditions and a construction/utility worker under reasonably foreseeable future use conditions. A residential receptor was not evaluated as this use is not considered a short- or long-term foreseeable future use and therefore was not evaluated. The results of a Method 3 risk characterization conducted as part of this RAO indicate that a condition of No Significant Risk to human health, safety, public welfare, and the environment exists for current and future Site uses based on the following:

- Sources of potential releases have been eliminated at the Site.
- The calculated total non-cancer risk for an indoor worker and a construction worker are below the DEP acceptable limits.

Based on conversations with the Department of Environmental Protection's Office of Research & Standards, an Activity and Use Limitation (AUL) is being placed upon a portion of the Site (which is also a portion of the property) to document the in-place backfilling of 100 feet of 10-inch diameter asbestos concrete pipe. A Class A-3 RAO can be obtained for the Site. For all documents related to this spill please see Mass DEP's searchable waste site at: <http://db.state.ma.us/dep/cleanup/sites/search.asp>



## **PSOC # 1 – Oakdale Rehabilitation and Skilled Nursing Center**

### **4000 gallon propane UST located at Oakdale Rehabilitation and Skilled Nursing Center**

According to the West Boylston Fire Department the UST at this site was installed in 12/2007.

The greatest potential hazard from a leaking UST is that the petroleum or other hazardous substance can seep into the soil and contaminate groundwater. A leaking UST can present other health and environmental risks, including the potential for fire and explosion.

Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and leak into the environment. Faulty installation or inadequate operating and maintenance procedures also can cause USTs to release their contents into the environment.

The Underground Storage Tank (UST) program was created in 1985 to help prevent contamination caused by leaking tanks. Tank owners and operators must comply with state rules for USTs.

The goal of the UST Program is to protect human health and the environment by preventing releases of petroleum and hazardous substances from UST systems. The release of these regulated products into the environment threatens groundwater resources and can cause explosive vapors to seep into confined spaces and occupied dwellings.

The majority of underground storage tanks (USTs) contain petroleum products (gasoline, diesel, heating oil, kerosene, jet fuel), but many other substances classified as hazardous by the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund") are stored in USTs.

The Underground Storage Tank (UST) Program is a major component of the Massachusetts groundwater resource protection effort. MassDEP implements federal requirements addressing registration and inspection of UST systems used to store petroleum fuels or hazardous substances. UST systems found to be leaking or otherwise not functioning properly must be repaired or replaced, and any resulting environmental damage assessed and cleaned up.

### **Medical Hazardous Waste**

This facility generates medical waste. According to the Environmental Protection Agency (EPA), medical waste is all waste materials generated at health care facilities, such as hospitals, clinics, physician's offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as medical research facilities and laboratories.

The Medical Waste tracking Act of 1988 defines medical waste as "any solid waste that is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals." This definition includes, but is not limited to:

- blood-soaked bandages
- culture dishes and other glassware
- discarded surgical gloves
- discarded surgical instruments
- discarded needles used to give shots or draw blood (e.g., medical sharps)
- cultures, stocks, swabs used to inoculate cultures
- removed body organs (e.g., tonsils, appendices, limbs)
- discarded lancets

#### Contaminants of Emerging Concern

Chemicals are being discovered in water that previously had not been detected or are being detected at levels that may be significantly different than expected. These are often generally referred to as “contaminants of emerging concern” (CECs) because the risk to human health and the environment associated with their presence, frequency of occurrence, or source may not be known. EPA is working to improve its understanding of a number of CECs, particularly pharmaceuticals and personal care products (PPCPs) and perfluorinated compounds among others.



*The Oakdale Rehabilitation and Skilled Nursing Center  
near the Oakdale Well – 01G.*

In many instances, at health care facilities and pharmacies, pharmaceuticals are sent to a regulated medical waste incinerator. Additionally, many pharmaceutical wastes are disposed of down the drain. EPA generally considers sewer disposal inadvisable for pharmaceuticals and discourages this practice, unless specifically required by the label on the particular pharmaceutical. In hospitals and other health care facilities, the practice of disposing of pharmaceuticals to sewers has taken place. This has occurred despite the potential adverse effects of introducing waste pharmaceuticals into the environment, and the inability of wastewater treatment plants to treat some pharmaceuticals effectively. Recent studies have documented the presence of various pharmaceutical chemicals and metabolic by-products in surface waters and groundwater in the United States, and the issue of pharmaceutical use and management has become increasingly important. EPA is conducting research on the presence of pharmaceutical compounds in waterbodies and any ecological effects the compounds may be causing, as well as research directed towards improving water treatment capabilities. For these and other reasons, pharmaceutical waste management has become an increasingly critical issue in environmental management for health care facilities.

## **Strategies for PSOC # 1 – Oakdale Rehabilitation and Skilled Nursing Center**

### **Underground Storage Tank (UST)**

- Identify all UST and fuel storage tank owners/operators and in co-operation with the Fire Department provide them with information and guidance on:
- Development and implementation of preventative measures to reduce the potential for releases, including measures operators can take to reduce the likelihood and minimize impact of spills during filling operations.
- Procedures for reporting releases or threats of a release from underground storage tanks (UST) or aboveground storage tanks (AST).
- Spill Prevention Contingency Plan development assistance for facilities with Above Ground Storage Tanks or Underground Storage Tanks.
- Guidance for assessment and remediation during tank removal.

See Appendix C for a complete list of UST's located in West Boylston's Zone II.

### **Medical Waste**

The following information is also applicable the hazards of residential septic system disposal of medical pharmaceuticals. Outreach efforts should also include residents utilizing home septic systems in the Zone II's of the West Boylston Water District.

The federal guidelines from the Office of National Drug Control Policy recommend:

Do not flush prescription drugs down the toilet or drain unless the label or accompanying patient information specifically instructs you to do so. For information on drugs that should be flushed visit the US Food and Drug Administration's website: <http://www.fda.gov/default.htm>

To dispose of prescription drugs not labeled to be flushed, you may be able to take advantage of community drug take-back programs or other programs, such as household hazardous waste collection events, that collect drugs at a central location for proper disposal. Call your city or county government's household trash and recycling service and ask if a drug take-back program is available in your community.

If a drug take-back or collection program is not available:

1. Take your prescription drugs out of their original containers.
2. Mix drugs with an undesirable substance, such as cat litter or used coffee grounds.
3. Put the mixture into a disposable container with a lid, such as an empty margarine tub, or into a sealable bag.
4. Conceal or remove any personal information, including Rx number, on the empty containers by covering it with black permanent marker or duct tape, or by scratching it off.
5. Place the sealed container with the mixture, and the empty drug containers, in the trash.

Encourage good communication about the hazards of improper medical waste disposal between the medical facilities and Zone II residents by the West Boylston Water District through outreach materials and site visits.

For more information about proper disposal of medical waste please visit the EPA website for the protection of drinking water at <http://water.epa.gov/drink/>.

### **PSOC # 2 former site of R.E. Chapman Co.**

R.E. Chapman Co. was a well drilling company that no longer is at this site. There is the potential for a new occupant. According to the West Boylston Fire Department the 550 gallon UST at this site was removed in April 2004. The Fire Department reports that there may be other UST's at this site. The state database for UST's has an active UST listed for this site.

Please see the information about Best Management Practices (BMP's) in the PSOC #1 section/strategies for the Oakdale Rehabilitation and Skilled Nursing Center and Appendix C for complete information of the UST at this site.



*Excavating a leaking UST (LUST) and preparing the cavity for soil sampling.*

According to the Fire Department, R.E. Chapman reported that they sealed all the floor drains in the buildings. It is recommended that any new businesses at this site have a full inspection by the Board of Health to confirm this report.

### **Strategies for PSOC # 2 former site of R.E. Chapman Co.**

Best Management Practices (BMPs) can help to protect drinking water supplies from contamination by materials used in daily business operations. Concerns include the improper handling, storage, or disposal of cleaning solvents, fuel, motor oil, used batteries, machinery parts, leaks from underground storage tanks, detergents, fertilizers and pesticides, de-icing chemicals, medical wastes, paints, and other hazardous chemicals and wastes.

#### **Hazardous Materials:**

- Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available at [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP's for common business issues.
- Use BMPs for proper hazardous material handling, storage, disposal, and emergency response planning.
- If your business is an unregistered generator of hazardous waste, determine your generator size:  
<http://www.mass.gov/dep/recycle/approvals/hwforms.htm#gen>  
and register with MassDEP:  
<http://www.mass.gov/dep/recycle/laws/policies.htm#hw>.
- Encourage the West Boylston Hazardous Waste Coordinator to work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- Upgrade all above and below ground oil/hazardous material storage tanks 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](http://www.dor.state.ma.us/ust/ust_home.htm).

### **Floor Drains:**

Floor drains connected to dry wells or septic systems provide a route directly to groundwater if leaks or spills occur. In some cases floor drains may discharge to storm sewers or directly to surface waters.

- Investigate where floor drains flow. If floor drains do not flow to a tight tank or municipal sewer, comply with MassDEP UIC requirements. For more information, refer to <http://www.mass.gov/dep/water/drinking/uicqa.htm>.
- Floor drains in areas where hazardous materials or wastes are stored must drain to a tight tank, be sealed, or be connected to a municipal sanitary sewer. See <http://www.mass.gov/dep/water/drinking/sourcewa.htm#> ground for more information.
- Educate local businesses on Massachusetts floor drain requirements. Encourage the Board of Health to continue to enforce or enact a local floor drain regulation.
- **See Appendix A for a complete Model Floor Drain Regulation recommended by the MassDEP.**

### **Septic Systems:**

- Do not dispose of any hazardous materials such as cleaners, paints, or oil to a septic system. Septic systems drain to the soil without treatment.
- Locate, inspect, and maintain septic system components regularly to ensure a working system. See <http://www.mass.gov/dep/water/wastewater/septicsy.htm#care>.

### **PSOC # 3 – Jacqueline’s Hair Salon**

This business is tied into the West Boylston sewer system, though there is a historical septic system use at this site.

Hair salons do produce toxic waste in the form of hair colorants, treatments, and other chemicals. There is a way to prevent these chemicals from reaching the environment: Contain the effluent in a holding tank, and have the tank pumped out regularly by a licensed hazmat disposal company. The state of Massachusetts requires this, and issues mandates for holding tanks for beauty salons. Many nonresidential system owners have specific issues they need to address for their industry.



*Jacqueline’s Hair Salon along Main/Thomas Street in the Oakdale section of West Boylston.*

Septic systems (conventional septic systems, I/A technologies, and cesspools) also serve a variety of nonresidential groups such as beauty shops, drycleaners, hospitals, schools, restaurants, and funeral homes.

If a nonresidential system discharges less than 10,000 gallons of sanitary wastewater only per day, it is subject to the Massachusetts Title 5 regulation and its requirements. For a complete list of nonresidential on-site dischargers subject to the Title 5 regulations, see 310 CMR 15.004.

Nonresidential systems discharging anything other than sanitary wastewater (e.g., industrial wastewater) must store the non-sanitary wastewater in an industrial wastewater holding tank and apply for an industrial wastewater holding tank permit. Sanitary waste from these facilities can still be discharged to an on-site system.

For more information on industrial wastewater discharges and holding tanks you should go to <http://www.mass.gov/dep/water/wastewater/industri.htm>.

Beauty Parlors - toilet waste and regular shampoo water can go to a septic system as long as it's less than 10,000 gallons per day. However, the wastewater from chemical discharges (perms, coloring and other) needs to be stored in an industrial wastewater holding tank permitted by MassDEP. Dischargers have the choice to either direct all their sinks to a holding tank or have all of the chemical wastewater go to a special sink that is separately plumbed to a holding tank, with staff educated to ensure they only use that one sink for these processes.

If a discharge of industrial wastewater to a septic system is being discontinued, then in addition to complying with requirements for holding tanks, a beauty parlor that has been discharging industrial wastewater must notify MassDEP's Underground Injection Control (UIC) Program that the discharge is being closed.

### **Strategies for PSOC # 3 – Jacqueline's Hair Salon**

- Check status of septic system through direct outreach and make sure any hair salons that use chemical treatment are in compliance with state and federal regulations.

#### **1. Holding Tank Requirement**

According to the Massachusetts Department of Environmental Protection, (MassDEP) a holding tank is mandated to contain chemical discharges such as hair dyes. The easiest way to comply is by designating only one sink to chemical wastewater, and have that sink plumbed only to the holding tank. This is an ironclad mandate, there are no exceptions to this rule. The MDEP will provide expert assistance to a salon owner on the design criteria of the tank, depending on the size of the salon and the expected output per day.

#### **2. Federal Compliance**

The state of Massachusetts requires a beauty salon to comply with federal law. A beauty salon is classified as a section 7231 hazardous waste producer under the SIC (Standard Industry Classification) system. Therefore, a salon has to comply with the Resource Conservation and Recovery Act of 1976, known as RCRA which is under 310 CMR 30.310.



Under this mandate, a salon is required to keep a manifest of all hazardous waste produced, since a "cradle to grave" tracking system is in place for all wastes.

In Massachusetts, a Uniform Hazardous Waste Manifest is used, and a salon is responsible for filling out the generator (initial producer) section.

### **3. EPA Identification Number**

As a Hazardous Waste Producer, a salon has to apply for and receive an EPA (Environmental Protection Agency) identification number. This is in accordance with 310 CMR 30.303. This is a 12 digit number, and is unique for a variety of factors, such as salon location. Being site specific, if the salon moves then a new EDA ID must be applied for. Before a licensed waste hauler can pump out your tank, you must show this number to him, and must enter it in block one of the Massachusetts Uniform Hazardous Waste Manifest.

### **4. Annual Fee**

As of June of 2004, there is an Annual Compliance Assurance Fee under 310 CMR 4.03 of \$525 per year. This is used to cover compliance recording costs, providing technical assistance, and notification processing.

## **Strategies for PSOC # 4, # 7 and # 9 – Transportation Corridors Routes #140, # I-190, Thomas Street and Thomas Street Parking Lot**

Threats posed by roads and parking areas in the Zone II include leaks and spills of motor vehicle fluids, rubber particles, pavement sealers, deicing products and other hazardous materials. Some of the potential contaminants associated with these activities include, sodium, chloride, heavy metals, Synthetic Organic Compounds and Volatile Organic Compounds, which can make their way into the subsurface material and eventually into groundwater.



Rain water, or surface water runoff, from roads and parking areas is traditionally piped offsite, often to the nearest stream or channel, which greatly increases the intensity of contaminant pollution in that area. Over time, the system is can become greatly impacted by these contaminants resulting in degraded drinking water and degraded wetland and aquatic systems.

*The Thomas Street Parking lot was moved out of the Oakdale Well's Zone I after MTBE was detected in the source water.*

In addition to rainwater, snow on impervious surfaces can become contaminated with road salt, sand, litter, and automotive pollutants. As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and, at certain levels, are toxic to aquatic life. Sand washed into waterbodies can create sand bars or fill in wetlands, ponds and streambeds, which impacts aquatic life, causes flooding, and ultimately reduces their effectiveness as natural water filters.

In order to keep roads safe for winter travel, a large amount of de-icing materials are needed on roads in Massachusetts. Salt, or sodium chloride, is the most commonly used de-icing material. In general, the purpose of the application of road salt is to: reduce adherence of snow to the pavement; keep the snow in a "mealy" condition and thereby permit nearly full removal by plowing; and prevent the formation of ice or snow ice (hard pack).

According to the National Research Council (NRC), road-salt use in the United States ranges from eight million to twelve million tons of sodium chloride per year. Massachusetts, New Hampshire, and New York report the highest annual road-salt loadings in the United States. Massachusetts reports the highest average of 19.94 tons/lane-mile/year. The Massachusetts Department of Transportation averages nearly 70 tons/ lane-mile/year on state highways.

According to the EPA, high levels of sodium and chloride can create significant adverse health, environmental, and infrastructure problems. Continued high levels of salt on the roads in Massachusetts could potentially jeopardize the health of consumers who suffer from hypertension, heart disease or kidney disease. Road salt also affects the taste of water, destroys protective vegetation and soil buffers, and corrodes automobiles, bridges, and other infrastructure.

### **Oakdale Well-01G Roadways and Parking**

Thomas/Main Street runs through the Oakdale Well's Zone I as well as the Mass Central (recreational) Rail Trail. The Zone I for each of the West Boylston wells has a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Oakdale Well 01G Zone I is not owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the MassDEP regulations and contain non water supply activities such as homes and public roads.

There are a few other roadways within the Zone II recharge areas of West Boylston's Wells including the major transportation Routes 140 and I-190. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, or accidental spills. Clandestine dumping is identified as a significant threat to the water supplies and roadways; remote roadways in particular, are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. Right-of-way maintenance can also be a source of contamination. Water suppliers should ensure that the utility managers are using accurate maps of source protection areas.



The Oakdale Well-01G did experience a Methyl Tertiary Butyl Ether (MTBE) contamination detected in 2004. The MTBE contamination is suspected to have originated in a parking lot for the Mass Central Rail Trail that was located in the field between the Oakdale Well 01G and Thomas Street near the shoreline of the Reservoir. The parking lot was moved in 2005 to its present location shown on the map depicting PSOC's for the Oakdale Well.

According to the West Boylston Water District the lot is heavily used on the weekends for recreational purposes. There has been no MTBE detected since the parking lot was moved.

### **Over Salt Application to Roadways**

A growing problem in Massachusetts is sodium contamination of drinking water supplies from the over application of road salt in the winter months. There is presently no maximum contaminant load for sodium for public drinking water sources, though there have been actions by communities to decommission wells near major transportation routes due to sodium concentrations.

### **Example of a Massachusetts Community Well affected by Road Salt.**

The Massachusetts Highway Department (MassDOT) instituted a low-salt zone along portions of Route 9 in 1983 at the request of Pioneer Valley Planning Commission and the Town of Cummington due to the contamination of nearby wells from road salt. One of these zones is a one-mile section from the Dudley Manor Bridge in the east to the western entrance of Main Street. This section of road is posted with 'Low-Salt Zone' signs at each end. (Personal Interview, R. Longton, MHD, 8/13/03) The Cummington Section of Route 9 was one of the four model reduced road salt areas initially designated in the Pioneer Valley region. This program was so successful that it led to a statewide policy on reduced road salting in water supply areas.

When the West Boylston Water District suspects that the sodium levels have become elevated for its wells they must conduct series of tests. The procedures for demonstrating that the wells have concentrations of sodium due to road salt are:

1. Test for sodium levels and demonstrate high peak times, (such as spring runoff).
2. Test quarterly and have a least 2 years worth of data.
3. Utilize documented evidence that the sodium levels are elevated and request that the MassDOT maintenance ensure low-salt application near public wells.
4. Apply for and erect Low-Salt Signs from MassDOT.

### **Massachusetts Department of Transportation (MassDOT) Salt Application Procedures**

Each year, the MassDOT Board of Commissioners votes to renew the low-salt zones throughout the Commonwealth. The application policies and salt to sand ratios vary between zones. Along most state Routes, such as Route 9, the application rate is based on a mixture of a commercial Premix and sand. Premix is a mixture of sodium chloride and calcium chloride at a 4:1 ratio. The sand and salt mixture spread is generally one part Premix to three or four parts sand, depending on weather conditions, at an application rate of 240 pounds per lane mile. One lane mile is 12 feet wide by one mile long.

The application rate of 240 pounds per lane mile is programmed into a computerized spreader on the plow trucks. The drivers have the ability to override the computer and increase the application if extreme weather conditions necessitate. Any one section of road can receive multiple applications throughout the life of a storm. MassDOT has recently begun pre-wetting with liquid calcium chloride to break up the ice bond with roads before making low-salt applications. This makes the low-salt treatment more effective reducing the need to override the computerized spreader and increase the salt ratio.

MassDOT acknowledges that low-salt applications are not always adhered to in low-salt zones due to staff turnovers and general oversight. If a West Boylston resident suspects that their well has been contaminated by road salt contact the West Boylston Water District for more information. MassDOT has a policy that if a homeowner has a medical condition that is exacerbated by sodium, and can prove that the high sodium content is the result of road salt, the agency will financially aid the homeowner with remediation. Possible actions may include water treatment or siting a new well away from the road.

### **ICE BAN™**

The Town of West Boylston Department of Public Works (DPW) does use Calcium Chloride Flake along with Salt for road de-icing.

It is recommended that the Town of West Boylston consider using a product (or similar product) called ICE BAN™ on the roads in the winter. ICE BAN™ is one of a breed of new, environmentally friendly, anti-icing/deicing agents. It is made of liquid byproducts from the processing of grains and other agricultural products. ICE BAN™ is highly soluble in water, biodegradable, non-toxic, and non-corrosive, according to the manufacturer. When mixed with brine or used as a prewetting agent, it could reduce the amount of damaging chlorides in the environment. The manufacturer claims that a mixture of as little as 20 percent of the product to 80 percent sodium chloride is less corrosive than tap water. Please refer to the **Resources** section for more information on ICE BAN™.

### **Strategies for PSOC # 3, # 7 and # 9 – Transportation Corridors Routes 140, I-190, Thomas Street and Thomas Street Parking Lot**

- The West Boylston Water District, West Boylston Board of Health and Board of Selectmen should submit a joint letter to MassDOT requesting compliance with the low-salt zone application rates and procedures along Route 140 in West Boylston's Water Supply Protection District.
- Work with the West Boylston Department of Public Works (DPW) to reduce sodium de-icing materials near any West Boylston Water District public wells.
- Partner with the Police Department, Fire Department and DPW to create a Zone II Road Map, emergency plan and spill kit for cleanup on the roadways and parking areas located within the Zone II of the West Boylston Water District Wells.

## **Hazardous Spills**

- The following recommendations are important to address potential hazardous waste spills in transportation corridors and in both railroad and power-line right-of-ways.
  1. Be sure that Emergency Response (ER) teams for the highway, fire and police departments and the railway company are aware of the water supply protection areas in West Boylston. Provide them with an updated map, if necessary.
  2. Work with the municipality or MassDOT to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
  3. Consider working with local watershed groups to institute a Storm Drain Stenciling Program, if there is not a local program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwaterstencils.com>.
  4. 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 NPDES Phase II Stormwater Rule requiring some communities to complete stormwater outfall mapping. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.
  5. Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). The USDA web site is [www.ruraldev.usda.gov](http://www.ruraldev.usda.gov) or call the local office in Hadley at 413-585-1000.
  6. Review the fact sheet available on line and call the local office of the NRCS for assistance  
<http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
  7. Visit MassDEP's Nonpoint Source Pollution web site for additional information and assistance at  
<http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

## **PSOC # 5 Railroad Corridor**

A railroad, owned by PanAm runs through along the eastern border of Oakdale Well - 01G Zone II. 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. Work with local officials in West Boylston during their review of the railroad and other utility right-of-way Yearly Operating Plans (YOP) to ensure that water supplies are protected during vegetation control or maintenance of the utility. The MassDEP Pesticide Bureau prohibits Railroads from using certain hazardous chemicals within the Zone I and II.

### **Strategies for PSOC # 5 Railroad Corridor**

- It is recommended that the West Boylston Water District work with its Conservation Commission in approving the Railroads and Utility Management Yearly Operating Plans (YOP). A map depicting West Boylston's wetland locations and Zone II locations will indicate where the railroad must comply with low spraying applications of herbicides.
- Review the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices (BMP's) are implemented with regard to vegetation control in the Zone II and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses and supply them with an accurate map as appropriate.
- Work with the Emergency Management Director to review Emergency Response Plans. Updates to this plan should include the railroad right-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate emergency response drills and practice containment of potential contaminants from train accidents with the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

### **PSOC # 6 Bonci-Warren Fire Training Facility**

This facility has historically been used as a fire training Facility for the fire department. Vehicles traveling by the well may pose hazardous waste problems. Water from fire suppression trainings can create large surges of water that have the potential to pick up debris on the surface and wash them into nearby streambeds and recharge areas. There is presently no training conducted at this facility and the Fire Department reports that no chemical fire suppression was used in the trainings.



*The gated entrance to the Bonci-Warren Fire Training Facility.*

### **Strategies for PSOC # 6 Bonci-Warren Fire Training Facility**

Consult with the West Boylston Fire Department to ensure that the West Boylston Fire District is notified if trainings resume at this site.

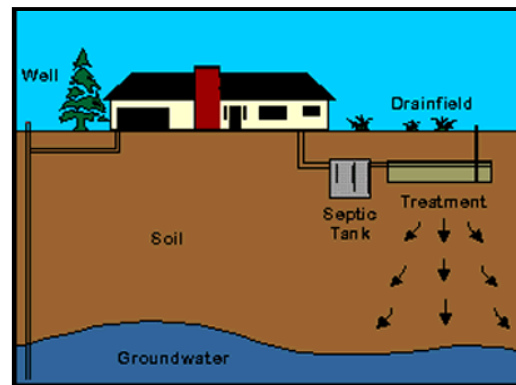
### **PSOC # 8 Residential Homes**

A large portion of the Oakdale Well 01G Zone II is sewered (See map provided by the Massachusetts Department of Conservation (DCR) Sewer Lines Oakdale, West Boylston). There are however some residences in the Zone II that utilize septic systems. Septic systems, along with heating fuel storage tanks and landscape care are the primary potential threats to the aquifer. The accompanying graphic depicts the cone of depression or the distance from which wells draw groundwater from the surrounding area. Land uses within the radius of influence can have direct impacts on the quality of well water supplies.

### **Septic Systems**

According to the United States Geological Survey (USGS), septic systems are the largest source by volume of waste discharged to the land.

Furthermore, a nationwide survey by the U.S. EPA and Cornell University found that the most common water-quality problem in rural water supplies is bacterial contamination from septic-tank effluent. According to the Environmental Protection Agency (EPA), septic tanks contaminate 1% of the nation's usable aquifers. The contamination of drinking water by septic effluent may be one of the foremost water-quality issues in the United States.



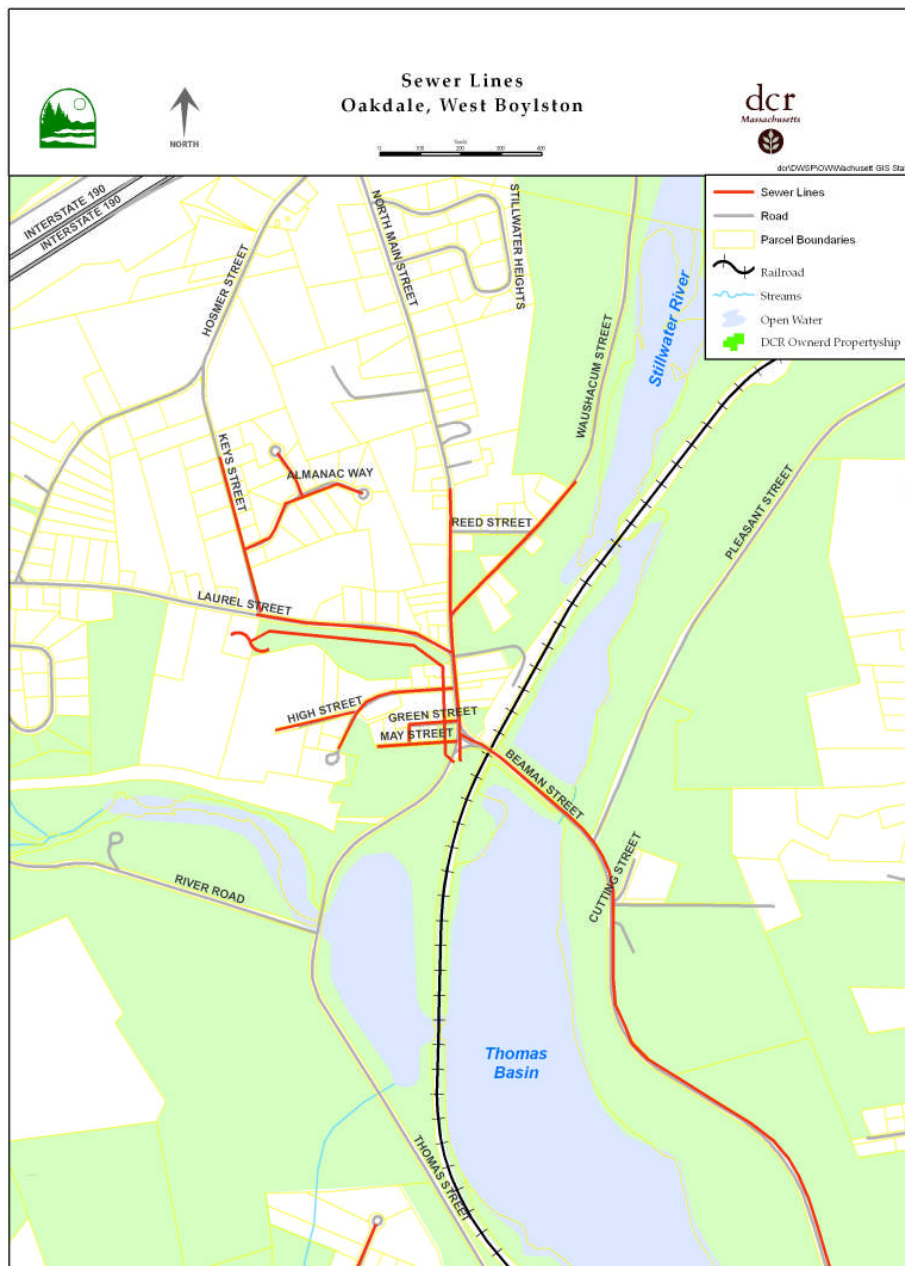
*Typical Septic System Model*

On-site septic treatment systems can stress the environment in a number of ways. They are often constructed in less than satisfactory soil conditions and are seldom maintained properly. Improperly functioning or failing septic systems can contribute viruses, bacteria, nitrates, and chemical compounds to groundwater. Proper maintenance can prevent costly problems in the future and prevent contamination of nearby drinking water supplies as well as other water resources such as rivers, ponds, and wetlands.

According to the USGS, it is also estimated that from one-third to one-half of existing systems could be operating improperly because of poor location, design, construction or maintenance practices. Even when operating properly, systems can be spaced so densely that their discharge exceeds the capacity of the local soil to assimilate the pollutant loads.

Additionally, on-site septic systems are also unable to treat many modern day household cleaners and chemicals which, when flushed down the drain or toilet, often impair or kill the bacteria needed to make the system work. The end results are improper treatment of wastewater-if not outright failure of the system-and the contamination of adjacent wells with septic effluent containing bacterium, nitrates and other pollutants. What happens to these contaminants in the ground is not well known. Some adhere to rock material while others travel with the water and end up in aquifers.

According to the University of Maine Cooperative Extension, septic tanks should be cleaned out every three to five years, depending on the size of the tank and the amount and quality of solids entering the tank. Furthermore, a visual inspection of the leach field should be completed annually. As a rule of thumb, the clean-out interval for a septic tank is determined on the basis of one hundred gallons of tank capacity per person per year. For example, a 1,000-gallon tank used by a family of two should be cleaned after five years  $[1,000 \text{ gal} \div (100 \text{ gal per year} \times 2 \text{ people}) = \text{five years}]$ . Checking sludge and scum build-up can be an unpleasant task. The best suggestion for determining a maintenance schedule is simply to have the tank pumped at regular intervals. The cleaning of a tank should be done by a commercial septic tank cleaning service.

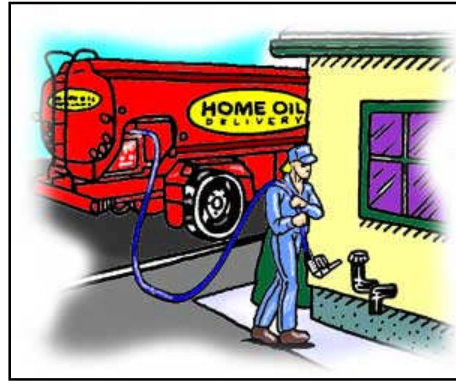




## Residential Fuel Tanks

Many residents West Boylston use oil or gas to heat their homes. The tanks that hold household fuel in older homes may be old and subject to leakage. Fuel tanks should be inspected visually on an annual basis and properly sealed on spill pads to prevent accidental spills or leaks from reaching groundwater through cracks or drains in the basement floor.

By September 30, 2011, you must upgrade your home heating system equipment to prevent leaks from tanks and pipes that connect to your furnace. By making a relatively small expenditure now, you can prevent a much greater expense in the future.



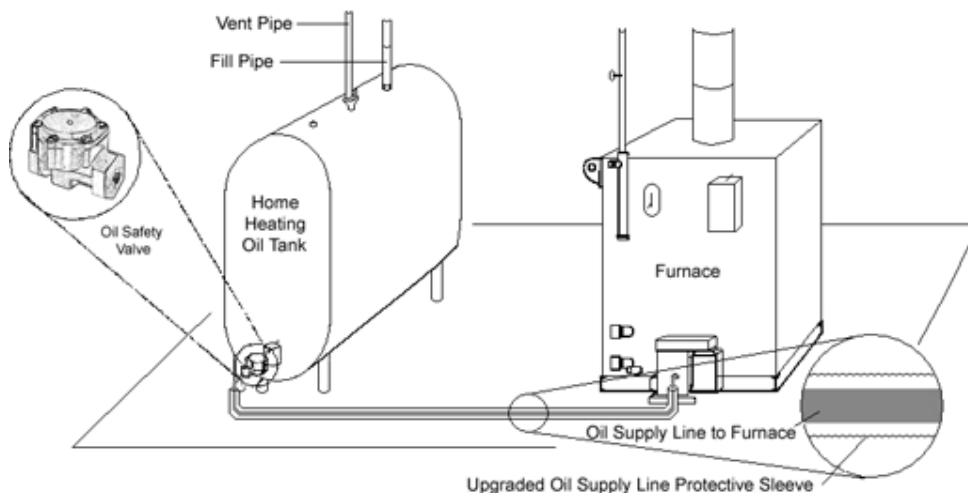
*Inspect and maintain home fuel tanks*

Massachusetts has a new law to address oil leaks from home heating systems (Chapter 453 of the Acts of 2008, as most recently amended in 2010). This law has two major provisions that require:

- the installation of either an oil safety valve or an oil supply line with protective sleeve on systems that do not currently have these devices; and
- insurance companies that write homeowner policies to offer coverage for leaks from heating systems that use oil.

Most homeowner policies do not currently include such coverage, leaving many to pay for costly cleanups out of their own pocket. Although it is mandatory that insurance companies make this coverage available by July 1, 2010 to homeowners whose systems are upgraded, the insurance is an optional purchase.

### Above-Ground Home Heating Oil System Leak Prevention Upgrades



Who must take action?

Owners of 1- to 4-unit residences that are heated with oil must already have or install an oil safety valve or an oil supply line with a protective sleeve, as shown in the diagram above. Installation of these devices must be performed by a licensed oil burner technician. Technicians are employed by companies that deliver home heating oil or are self-employed. It is important to note that heating oil systems installed on or after January 1, 1990 most likely are already in compliance because state fire codes implemented these requirements on new installations at that time. For more information see

### **Household Hazardous Waste**

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be “household hazardous waste” or “HHW.” Products, such as paints, cleaners, oils, batteries, and pesticides that contain potentially hazardous ingredients require special care when you dispose of them.

Improper disposal of household hazardous wastes can include pouring them down the drain, on the ground, into storm sewers, or in some cases putting them out with the trash. The dangers of such disposal methods might not be immediately obvious, but improper disposal of these wastes can pollute the environment and pose a threat to human health. Many communities in the United States offer a variety of options for conveniently and safely managing HHW.

### **Lawn Care**

Your property is part of a watershed, an area of land from which all the surface water and groundwater flows from higher elevations downhill to a common body of water. No matter how far you live from a body of water, your property is part of a watershed. Therefore, how you care for your yard can affect both water quality and water supply.

It's hard to imagine that a green, flourishing lawn could pose a threat to the environment. However, the fertilizers and pesticides you apply to your lawn are potential pollutants. If you improperly or excessively apply these chemicals, they can wash off your property and end up in ponds, bays, reservoirs, and other waters. Excess nitrogen and phosphorous, two key ingredients in fertilizer, may cause these waters to become overgrown with unsightly and foul-smelling algae and weeds. This overgrowth may result in fish kills, the pollution of shellfish beds and swimming beaches, and the lowering of waterfront property value. In addition, pesticides and nitrogen, which can dissolve in water, have the potential to contaminate groundwater - a source of drinking water.

## **Strategies for PSOC # 8 Residential Homes**

### **Septic systems**

- Never dispose of household hazardous waste to your septic system.
- Prevent failed septic systems by locating system components, maintaining, and inspecting your system regularly. See also <http://www.mass.gov/dep/water/wastewater/septicsy.htm>.
- Conduct outreach to owners with septic systems in Zone I and II of the wellhead area. Strongly encourage septic system maintenance for all residential septic systems in Zone I and II.
- Encourage residents to pursue group rates with their neighbors for septic pumping.



- Adopt regulations for the Water Supply Protection District that specifically prohibit septic system cleaners which contain toxic chemicals such as methylene chloride and 1-1-1 trichlorethan, and other hazardous wastes.

#### **Underground and Aboveground Fuel Storage Tanks**

- Upgrade fuel oil tanks to include proper containment and safety measures. Consult with the fire department before making changes, as any changes must comply with plumbing, building, and fire codes.
- Catch costly leaks by inspecting fuel lines and keeping a fuel log. See also <http://www.mass.gov/dep/public/press/1210spil.htm>

#### **Household Hazardous Waste**

- Participate in Household Hazardous Waste Collection days or centers for used oil, antifreeze, paints, and other chemical disposal. West Boylston has a regional hazardous waste recycling center.
- Substitute less hazardous substances for products used in the home. See <http://www.mass.gov/dep/recycle/reduce/househol.htm>.

#### **Lawn Care and Landscaping**

- Apply pesticides and fertilizers minimally and properly. More information on environmentally sound lawn care is available at <http://www.mass.gov/agr/waterwellbeing/> and <http://www.mass.gov/dep/water/resources/lawn.htm>.

#### **Car Care**

- Check your car for oil leaks, and repair leaks quickly.
- Dispose of waste oil properly, never in drains or on the ground. Recycle oil at a car care center or hazardous waste center. See <http://www.epa.gov/epawaste/consERVE/materials/usedoil/index.htm> and <http://www.mass.gov/dep/recycle/compliance/factguid.htm>.

#### **Pet Waste**

- Don't walk your pet near wells or reservoirs. Encourage the creation of pet waste stations for waste disposal in parks.
- Practice proper pet waste disposal, picking up after your pet and preferably flushing waste, or disposing of waste in the garbage.

#### **PSOC # 9 High Plain Cemetery**

The increasing number of cemeteries has caused concern about the possibility of releasing hazardous chemicals and metals into the surroundings. Possible contaminants include poisonous chemicals, such as arsenic and mercury, which were used in past embalming and burial practices, which used: formaldehyde from current embalming practices; varnishes, sealers, and preservatives used on wood coffins; and lead, zinc, copper, and steel from metal coffins. Dramatic increases in arsenic indicate contamination from embalming fluids or wood preservatives. Cemeteries are a concern for the quality of soil, groundwater, and nearby surficial water systems.

According to John L. Konefes and Michael K. McGee Old Cemeteries, Arsenic, and Health Safety in Water Industry News, from the Civil War until about 1910, arsenic was the main ingredient in the embalming fluids used widely throughout the country. Although effective, arsenic is toxic and persistent, and elemental arsenic will never degrade into harmless by-products. From about 1910 to the present formaldehyde has been used to preserve bodies for viewing. Though contamination from the High Plain

Cemetery is considered a low potential contamination issues; pesticides, fertilizers and herbicides used on landscaping in cemeteries can pose a threat.

#### **Strategies for PSOC # 9 High Plain Cemetery**

- Provide information to Cemetery maintenance crews about the hazards of over-application of pesticides, fertilizers and herbicides to drinking water.
- Provide information through about green burial practices that are becoming popular that do not involve embalming or coffins constructed with toxic materials. Please see [http://en.wikipedia.org/wiki/Natural\\_burial](http://en.wikipedia.org/wiki/Natural_burial) for more information.

#### **Land Use Lee Street Well – 04G**

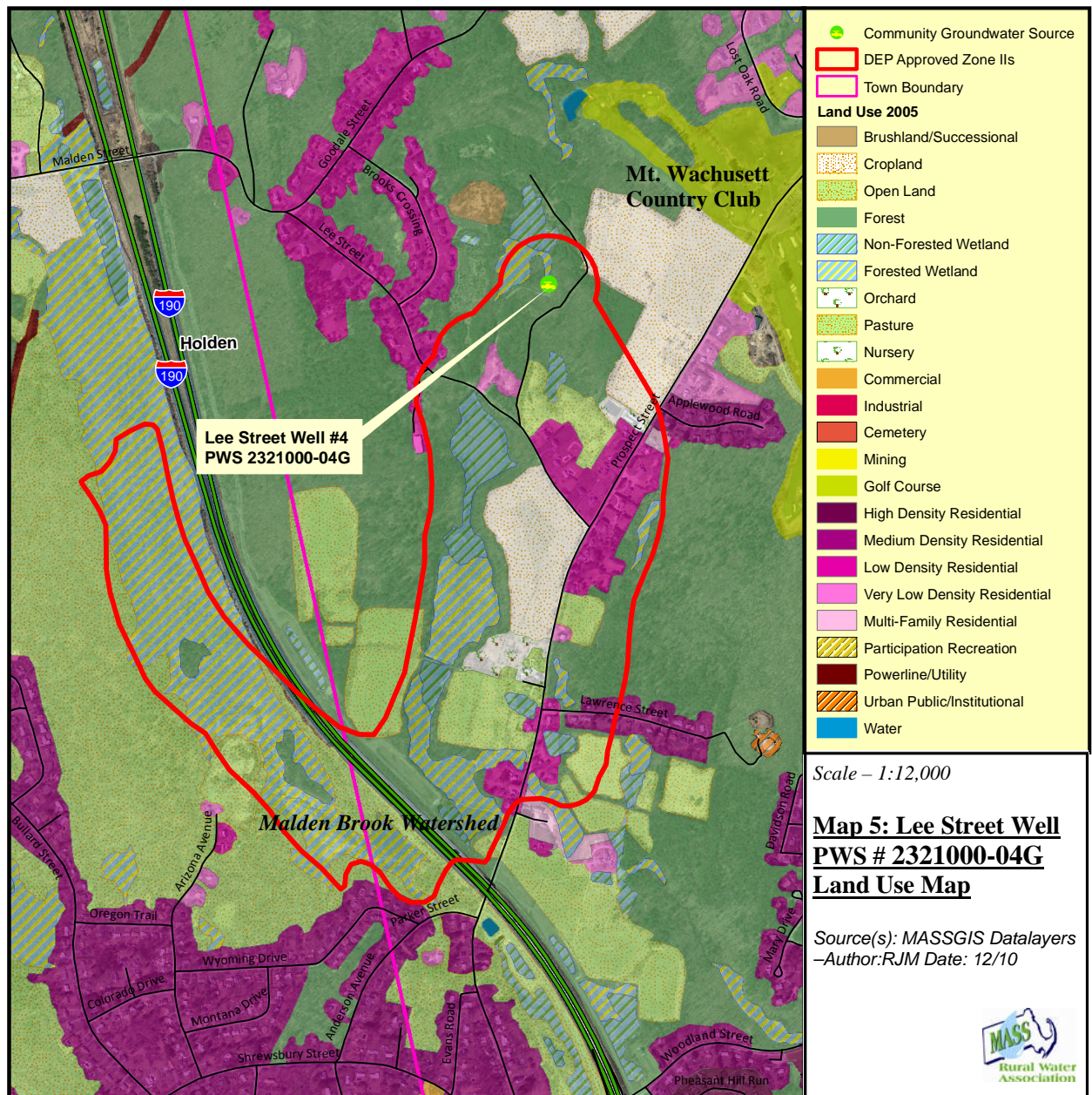
The Lee Street Well 04G is located within the Malden Brook Valley in West Boylston in a wooded area adjacent to the original Lee Street Wells 02G and 03G. The Malden Brook Aquifer is situated within the larger Malden Brook watershed. Malden Brook flows first south, then north around the southern flank of Malden Hill and then continues northward to the Wachusett Reservoir.

The Lee Street Well source susceptibility is rated as “Moderate” by the SWAP report prepared by the MassDEP. The Lee Street Well is situated near woodland, wetland and agriculture. The residential use is primarily low density that utilize septic systems and home heating oil. Approximately 1/3 of the Zone II is located in the Town of Holden. This land portion is predominately the riparian wetland of Malden Brook. The Zone I for the Lee Street Well is controlled by the West Boylston Water District. There is a large golf course, the Wachusett Country Club, just outside of the Zone II that utilizes an onsite pond for irrigation. The golf course does also have an interconnection to the Water District for use at the facility and for some irrigation.

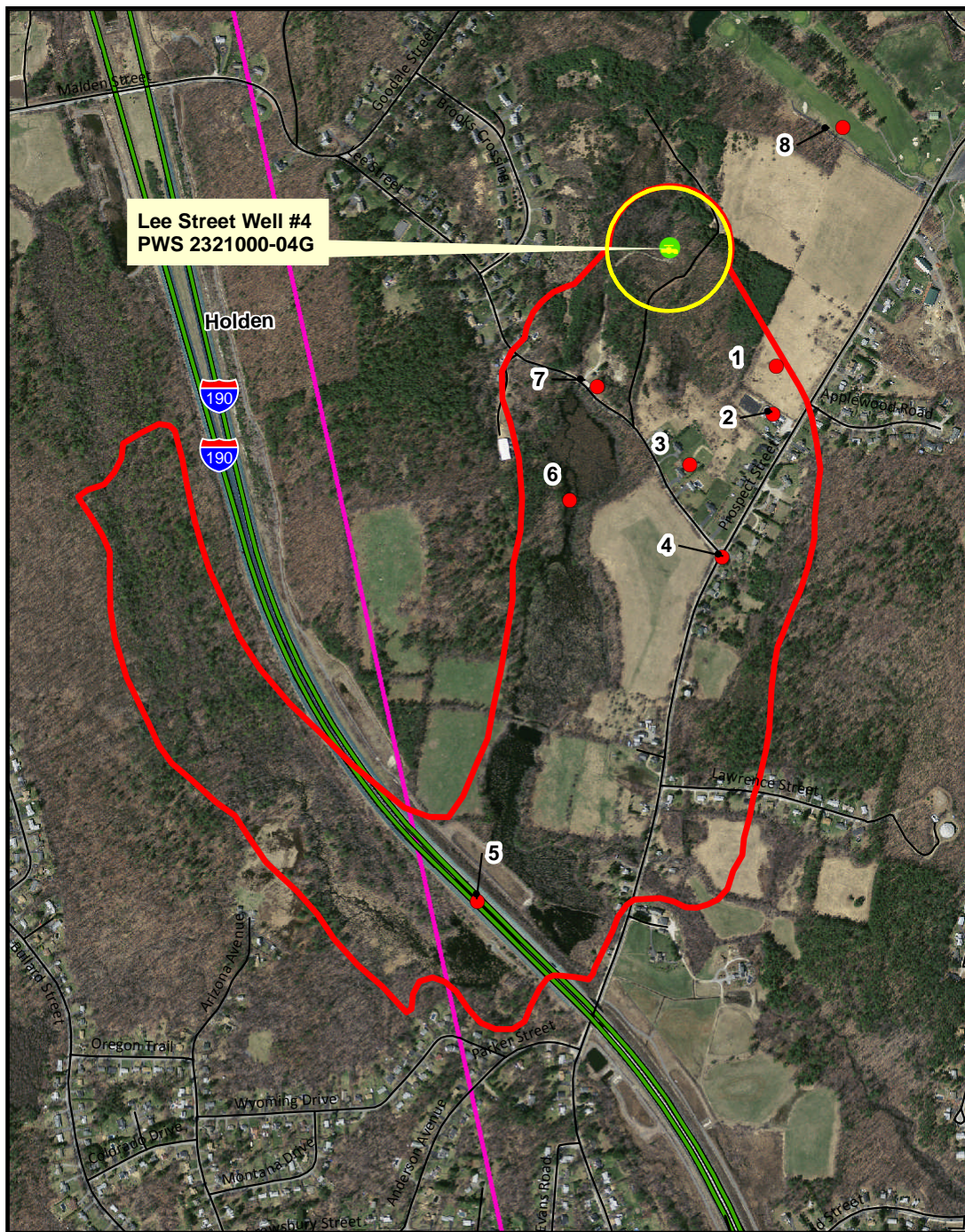


*Lee Street Well 04G gated entrance.  
The pumphouse in the background is  
one of the decommissioned wells at this  
location.*



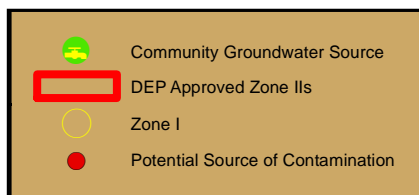






Scale – 1:11,250

### **Map 6: Potential Sources of Contamination Lee Street Well 04G Zone II**



Source(s): MASSGIS Datalayers –Author:RJM Date: 12/10



## Potential Sources of Contamination Lee Street Well – 04G

**Table 5: Potential Sources of Contamination Lee Street Well -04G**

<b>Potential Sources of Contamination Zone II Lee Street 04G West Boylston Water District PSW# 2321000-04G</b>			
<b>Site Number</b>	<b>Name</b>	<b>Potential source of contamination</b>	<b>DEP Risk Category<sup>1</sup></b>
1	Agricultural Activities	Livestock Operations Manure (microbial contaminants): improper handling Manure Storage or Spreading Pesticides: leaks, spills, improper handling, or over-application	M
2	Greenhouse	Fertilizers, heating oil	L
3	Residential Uses	Septic systems, heating oil, lawn and garden chemicals	M
4	Local Transportation Corridors/ Prospect and Lee Streets	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling	M
5	Transportation Corridors/ I-190	Hazardous spills, petrochemical runoff, salt application	M
6	Beaver Activity	Microbial contaminants	M
7	Stormwater Drains/ Retention Basins	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns	H
8	Wachusett Country Club Golf Course	Oil and gas storage, chemical cleaners for motors/ propane refilling	L
1 = High (H), Medium (M), or Low (L) threat to groundwater.			

### **PSOC # 1 Agricultural Activities**

There is a large horse farm, Malden Brook Farm to the south of the Lee Street Well and a few crop fields near the well on the eastern side within the Zone II. Potential threats to the quality of water associated with agriculture include animal manure, pesticides, fertilizers, herbicides, and waste oil and fluids generated by farm equipment.

The West Boylston Fire Department reported that they are aware of some old farms that may have UST's, but they are exempt from DEP reporting. One mentioned was the property at 378 Prospect Street listed as Malden Brook Farms. Unknown or exempt UST's can be a threat to drinking water supplies in that they are unreported and not monitored for leaks that may contaminate ground water. Please see the section **Strategies for PSOC # 1 – Oakdale Rehabilitation and Skilled Nursing Center** for more information about UST's and how to prevent their contents from contaminating ground water.

It is also recommended to the extent possible, that all new permanent manure pits and new animal feed lots shall be designed to restrict infiltration, run-off or other movement of animal wastes or manure to the any aquifer or surface water. Although grazing cattle and horses does not constitute a feed lot or manure pit, similar considerations should be given to the proximity of groundwater, surface water and the flow of runoff. In particular, private wells near large-scale farming activities may be especially vulnerable to contamination.

Encourage farmers and property managers 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 and call the local office of the NRCS for assistance:

<http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

Horses should specifically be prohibited from accessing Malden Brook by using signage and outreach to the horse farm owners.

#### **Strategies for PSOC # 1 Agricultural Activities**

- Conduct outreach to area farmers to inform them of the relationship of their lands to the public and private drinking water supply and provide information about agricultural best management practices. Especially concentrating on manure, pesticide, herbicide, and fertilizer use and storage.
- Remind farmers that a vegetated buffer that remains untilled and planted, is the best way to ensure that manure and chemical application does not contaminate drinking water sources through runoff.
- Inform farmers about local waste oil and automotive fluid collection centers and services.
- Ask farmer's to voluntarily inspect and replace UST's that pose a threat to groundwater.

Please see the **Resources** section for more information about horses and the possible contamination they may contribute to water supplies.



### **PSOC # 2 Greenhouse**

Whitetail Greenery is near the Lee Street Well 04G. Concerns for greenhouses include over-application of fertilizers and potential spills of heating oil to warm the greenhouses.

According to the UMass Amherst Extension Agricultural and Landscape program, greenhouse operations are encouraged to use "BMPs" to increase fertilizer efficiency and reduce runoff.

Nitrates and phosphates from fertilizer are potential environmental hazards if they enter groundwater or surface water by runoff or leaching.



*Whitetail Greenery on Prospect Street near the Lee Street Well 04G.*

Some greenhouse practices or common materials used in plant production may lead to the creation of nutrient-enriched effluent. First, most potting mixes have little ability to supply or retain nutrients in amounts to sustain plants without application of fertilizer. Second, many irrigation practices, especially overhead watering with a hose, are very inefficient in terms of water and nutrient loss. Third, water-soluble fertilizers are often used at rates in excess of the plants' needs without regard for volume applied and frequency of application.

### **Strategies for PSOC # 2 Greenhouse**

Nutrient management BMPs should promote the efficient use of fertilizer and reduce nutrient loss by maximizing the amount of nutrients used by the plant or retained in the plant container for potential use. Growers should attempt to meet three goals in developing a nutrient BMP program, they are:

- **Goal 1.** Match fertilizer application with plant nutrient needs as the plant grows.
- **Goal 2.** Stop or limit the loss of nutrients from the plant container during topwatering in an open system.
- **Goal 3.** Stop or limit nutrient and water loss from irrigation and leaching by containing the effluent.
- Please see [http://www.umass.edu/umext/floriculture/fact\\_sheets/greenhouse\\_management/bmp.html](http://www.umass.edu/umext/floriculture/fact_sheets/greenhouse_management/bmp.html) for more information.

### **PSOC # 3 Residential Homes**

There are several residences within the Zone II of the Lee Street Well 04G. All of the residences along Prospect Street are sewered (See map provided by the Massachusetts Department of Conservation - Sewer Lines Lee St., West Boylston), as well as the large subdivisions located in the Town of Holden. All other residences on Lee Street and in the Zone II utilize septic systems. The development to the west of Well 04G was built in the 1980's and therefore the septic systems are relatively new.

### **Strategies for PSOC # 3 Residential Homes**

Please see the PSOC section for Residential Uses in the Oakdale Well 01G portion of this plan for the Strategies and BMP practices that also apply to the Lee Street Zone II residences. Also see the **Resources** section at the end of this plan for more information.

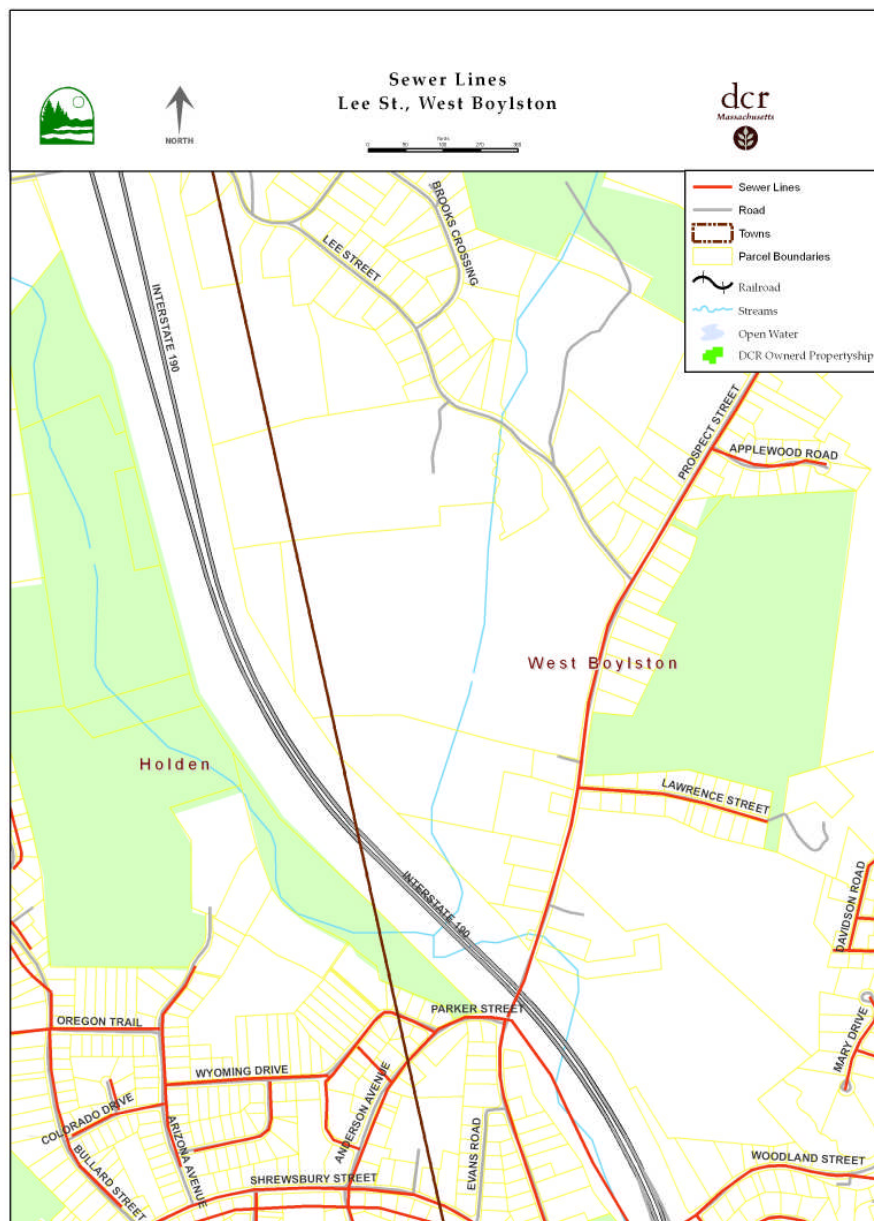
### **PSOC # 4 and # 5 Transportation Corridors I-190/Prospect and Lee Streets**

There are three roadways traversing the Lee Street Well 04G Zone II.

### **Strategies for PSOC # 4 and # 5 Transportation Corridors I-190/Prospect and Lee Streets**

Please see the PSOC section for Transportation Corridors in the Oakdale Well 01G portion of this plan for the Strategies and BMP practices that also apply to the Lee Street residences.

Also see the **Resources** section at the end of this plan for more information.



## **PSOC # 6 Beaver Activity**

### **Concerns about Water Quality**

The presence of beavers or muskrats near public water supply sources may pose a threat to the protection of public health. Both animals have commonly been identified as carriers of *Giardia Lamblia* and *Cryptosporidium*--pathogens identified within the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule respectively as posing an unacceptable risk to drinking water.

Amendments to the State's trapping laws charge MassDEP with determining when a threat to human health and safety exists as a result of the presence of beavers and muskrats in and around public water supply sources and pump stations. A MassDEP determination that a threat exists may be used by an applicant to petition the local Board of Health for an emergency permit to eliminate the threat.



*Residents are encouraged to report any new beaver activity within the Water Supply Protection District. Above is an abandoned beaver lodge along the bank of Wachusett Reservoir near the Oakdale Well 01G.*

Beavers are often associated with concerns about the quality of drinking water. Water exiting a beaver pond is high in organic chemicals and may be a cause for concern if beaver ponds are located near public water supplies. Giardiasis, an intestinal ailment caused by a *Giardia* parasite, is referred to by some as “beaver fever” because beaver are known to carry the organism. Although beavers do carry the *Giardia* parasite, so do many other animals that are found around lakes and reservoirs. Despite this, beavers will continue to be the primary focus for concern because they spend so much time swimming in our drinking water.

### **Strategies for PSOC # 6 Beaver Activity**

- The West Boylston Water District monitors for the evidence of beaver year round and takes appropriate measures to ensure that the animal does not impact the water supply.
- The West Boylston Water District utilizes a Beaver Deceiver in Malden Brook near the Lee Street Well 04G.
- Residents within the Water Supply Protection District are encouraged to contact the Water District if they notice heightened beaver activity in the area.

See the **Resources** section for the MassDEP Procedures for Beaver Control.

### **PSOC # 7 Stormwater Drains/Retention Basins**

Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Storm water pollutants such as nitrogen can be found in animal waste, fertilizers and failing septic systems. Surface water related impacts from nitrogen can manifest themselves through algae growth, reduce water clarity and the release of other pollutants.

### **Strategies for PSOC # 7 Stormwater Drains/Retention Basins**

Stormwater:

- Encourage local officials to become familiar with and implement a stormwater management program to meet MassDEP's Phase II Stormwater Regulations. Develop and implement a stormwater management plan. For additional information, refer to the Stormwater Management Information at <http://mass.gov/dep/water/wastewater/stormwat.htm>.
- Use street sweeping and structural solutions such as swales and catchbasins to best manage stormwater from streets and parking lots. Route stormwater drains away from drinking water sources.
- Inspect and clean out stormwater catchbasins on a regular basis. Catch-basin cleanings are classified as solid waste and must be handled and disposed of in accordance with all MassDEP regulations, policies and guidance.
- Develop non-regulatory protection strategies that include Best Management Practices such as stenciling stormwater drains, hazardous waste collection days, recycling programs, regulatory controls, public education, and herbicide, pesticide and fertilizer management.

### **PSOC # 8 Wachusett Country Club Golf Course**

The Wachusett Country Club Course lies just outside the Lee Street Well 04G Zone II to the North. The golf course uses its own irrigation system for the grounds maintenance, but does rely on the West Boylston Water District for backup water and potable water for the clubhouse.

### **MassDEP Water Management Policies**

MassDEP's research of typical golf course irrigation water use for turf maintenance included consultation with several golf course architects, both local and national, information from the National Fertilizer Institute and discussions with golf course irrigation specialists whose resumes included responsibility for irrigation systems on local and nationally known courses. In addition, in developing this policy DEP organized a Golf Course Technical Advisory Committee (TAC) comprised of DEP staff, environmental consultants who design courses, golf course industry representatives, and attorneys who represent golf courses and golf course developers. This TAC provided valuable review, comments, and recommendations for this policy.



MassDEP's research confirms that, for water use planning purposes, the irrigated turf should receive from 0.4 – 1.5 inches of water per acre per week during the peak three (3) month irrigation period. An application rate of 0.4 inches of water equals 10,861 gallons per week per acre; an application rate of 1.5 inches of water equals 40,728 gallons per week per acre, through the peak three (3) month irrigation period. The wide range in water use results from the previously noted variations in soil type, slope, vegetation, etc.

The irrigation levels were compared to documented metered water use on permitted courses in Massachusetts and were found to be comparable.

Other issues of concern for golf courses are:

Chemical applications to golf courses take two main forms – inorganic fertilizers and pesticides. Organic fertilizers, derived from seaweeds, manures and other organic sources are not, in this context, considered to be chemicals, although fertilizing with any material– and over fertilizing in particular – can pollute. The term 'pesticide' refers to the many substances used to control pests and the damage they cause. These include herbicides, insecticides, fungicides, lumbricides, rodenticides etc.

Chemicals are not used across the entirety of a golf course. They are targeted most closely at the tees, greens and green surrounds. These areas account for, on average, less than 10% of a golf course. Next in terms of chemical applications are the fairways, which make up an average of 21% of the golf course area. Semi-rough, which may take very occasional chemical treatment of herbicide, accounts for an average of 25% of the course. This leaves around 44% of golf courses, often valuable habitat, completely free from any chemical application.

Please see

[https://www.bestcourseforgolf.org/content/environment/key\\_issues/use\\_of\\_chemical](https://www.bestcourseforgolf.org/content/environment/key_issues/use_of_chemical)  
for more information on this topic.

### **Strategies for PSOC # 8 Wachusett Country Club Golf Course**

Golf courses are encouraged to adopt management techniques which avoid, or at least minimize, the use of all chemicals, notably fungicides and insecticides in favor of more robust cultural and mechanical turf management.



*View from Prospect Street looking  
over the Wachusett Country Club  
Golf Course towards the Wachusett  
Reservoir to the east.*

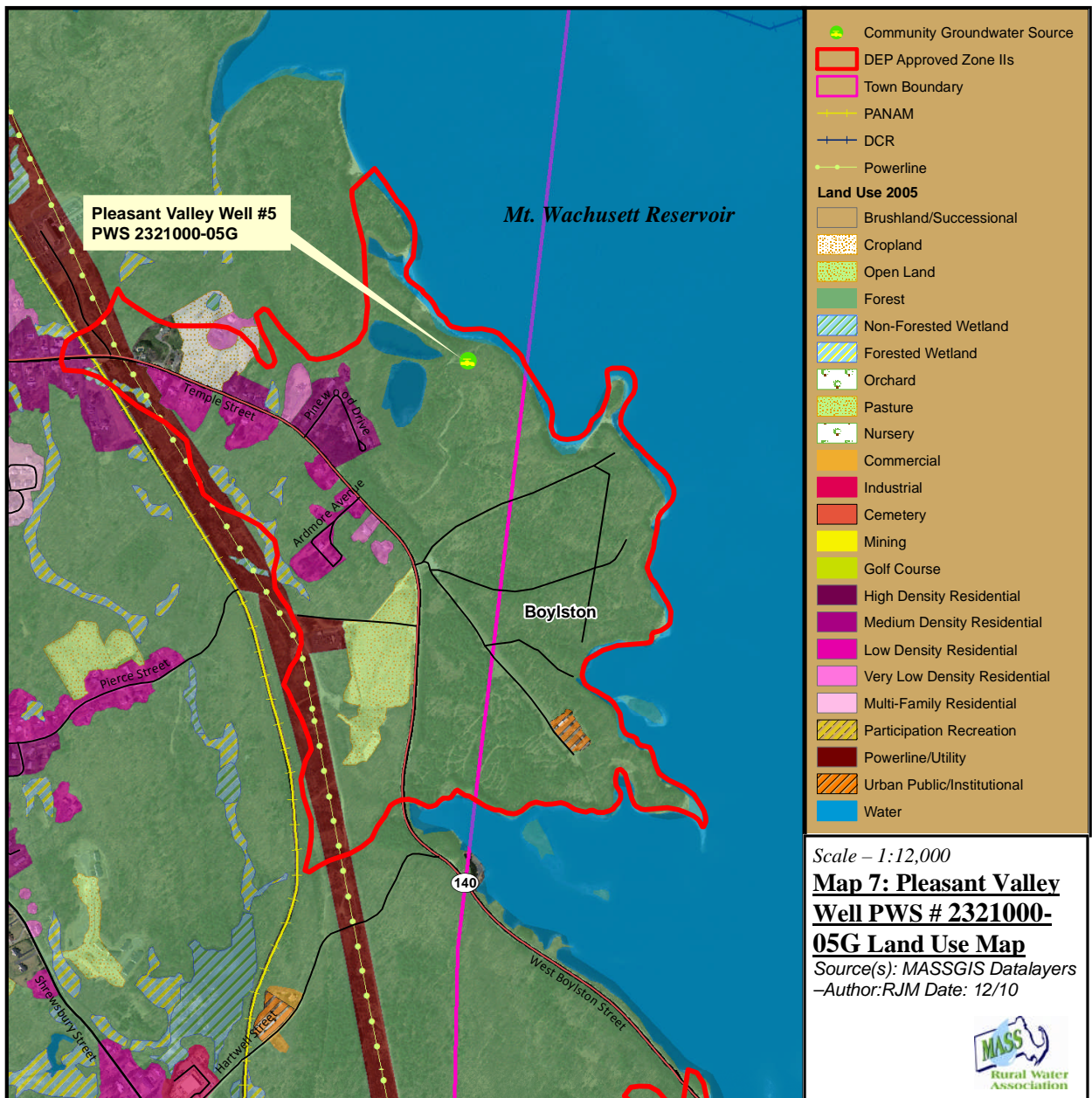
If chemicals have to be used, consider:

- what kind, and in what quantity, are chemicals applied to golf courses?
- how does this compare with other land uses, particularly the agricultural, horticultural and domestic sectors?
- what happens to chemicals after they are applied to golf turf?
- what measures can be taken to minimize the use of chemicals and thus the risks of pollution?

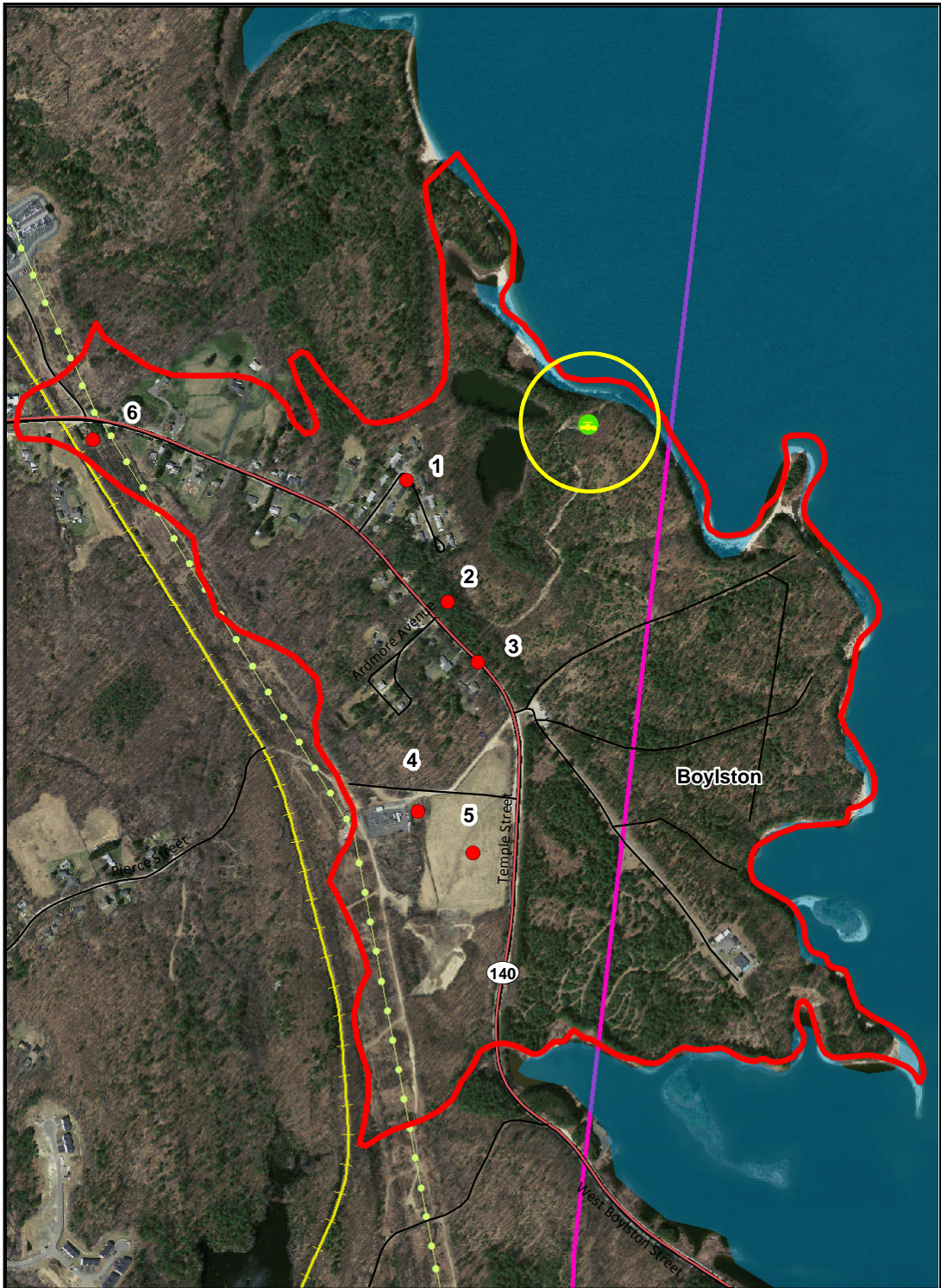
### **Land Use Pleasant Valley Well – 05G**

The Zone II occupies approximately 0.47 square miles on the western shore of the Wachusett Reservoir. The SWAP report by the MassDEP rates the source susceptibility of the Pleasant Valley Well as “High”. There are two small ponds near the well and the immediate surroundings are woodland. The land near the Pleasant Valley Well 05G is lightly developed and no known agricultural activities. The low-density residential development along Route 140 are sewered, but do utilize home heating oil or propane. Route 140 bisects the Zone II and a railroad and transmission line border the Zone II’s western edge. There is also a closed landfill within the Zone II that is no longer operational and is enclosed by a cyclone fence. The eastern bounds of the Zone II form a peninsula that lies within the border of the Town of Boylston and is managed by the MassDCR. There is no development in this area and it remains heavily wooded.



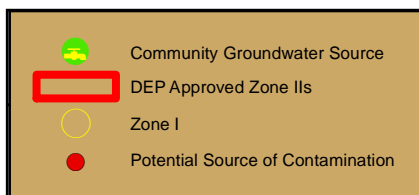






Scale – 1:10,000

**Map 8: Potential Sources of Contamination Pleasant Valley Well 05G Zone II**



Source(s): MASSGIS Datalayers –Author:RJM Date: 12/10



## Potential Sources of Contamination Pleasant Valley Well – 05G

**Table 6: Potential Sources of Contamination Pleasant Valley Well -05G**

<b>Potential Sources of Contamination Zone II Pleasant Valley Well 05G West Boylston Water District PSW# 2321000-04G</b>			
<b>Site Number</b>	<b>Name</b>	<b>Potential source of contamination</b>	<b>DEP Risk Category<sup>1</sup></b>
1	Residential Homes	Septic systems, heating oil, lawn and garden chemicals	M
2	Sewer Substation	Potential leaking infrastructure	L
3	Transportation Corridors/ Route 140	Hazardous spills, petro chemical runoff, salt application	M
4	Electric Transformer Station	PCB's	M
5	Former Town Landfill?	Contamination plumes from capped landfill.	M
6	Railroad/Electrical Utility Corridor	Herbicide application	M
1 = High (H), Medium (M), or Low (L) threat to groundwater.			

### **PSOC # 1 Residential Homes**

There are several residences within the Zone II of the Pleasant Valley Well 05G. All of the residences are sewered. Many of the residences do utilize home heating oil. (See map provided by the Massachusetts Department of Conservation Sewer Lines Pleasant Valley, West Boylston)

### **Strategies for PSOC # 1 Residential Homes**

Please see the PSOC section for Residential Uses in the Oakdale Well 01G portion of this plan for the Strategies and BMP practices that also apply to the Pleasant Valley Zone II residences.

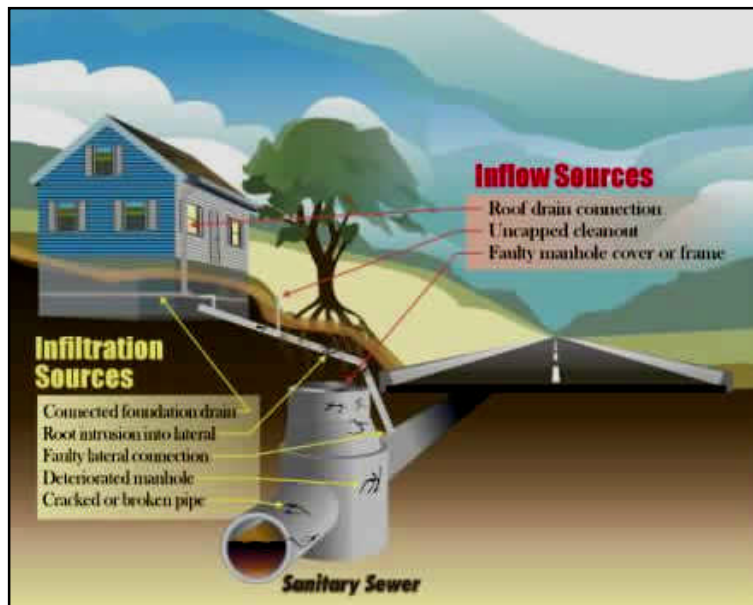
Also see the **Resources** section at the end of this plan for more information.

### **PSOC # 2 West Boylston Sewer Substation**

There is a sewer substation at the entrance road to the Pleasant Valley Well 05G.

According to the National Risk Management Research Laboratory Office of Research and Development of the U.S. Environmental Protection Agency (EPA). Many municipalities throughout the United States have sewerage systems (separate and combined) that may experience exfiltration of untreated wastewater from both sanitary and combined sewers. Sanitary sewer systems are designed to collect and transport to wastewater treatment facilities the municipal and industrial wastewaters from residences, commercial buildings, industrial plants, and institutions, together with minor or insignificant quantities of ground water, storm water, and surface waters that inadvertently enter the system. Over the years, many of these systems have experienced major infrastructure deterioration due to inadequate preventive maintenance programs and insufficient planned system rehabilitation and replacement programs.

These conditions have resulted in deteriorated pipes, manholes, and pump stations that allow sewage to exit the systems (exfiltration) and contaminate adjacent ground and surface waters, and/or enter storm sewers. Exfiltration is different from sanitary sewer overflows (SSOs). SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to surcharged pipe conditions. SSOs can be in the form of direct overflows to receiving water, street flooding, and basement flooding; whereas exfiltration is not necessarily caused by excess I/I and is merely caused by a leaking sewer from its inside to its surrounding outside.



*Typical sewage treatment infrastructure and its Inflow/Infiltration Sources.*

Untreated sewage from exfiltration often contains high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways. For more information please see the complete document at the EPA website: <http://www.epa.gov/nrmrl/pubs/600r01034/600r01034.pdf>

### **Strategies for PSOC # 2 West Boylston Sewer Substation**

Determine the condition of the sewer systems near all the West Boylston Water District wellfields. If the rehabilitation of the sewers is needed:

- Determine the cost effectiveness of any rehabilitation program to control infiltration and inflow, the Sewer System Evaluation Survey (SSES) is performed. SSES determines the specific location, estimated flow rate, method of rehabilitation, and costs of rehabilitation versus cost of transportation and treatment for each defined source.
- Steps in the SSES include visual inspection, smoke testing, dye water tracing and flooding, and internal television inspection. This process is usually performed by a consulting firm and the related data is put into a report and given to the needed group for recommendations on rehabilitation. The internal t.v. inspections can be performed using specialized video cameras and data base information systems.



- The data base software is needed to keep track of blemishes observed in the pipes. Blemishes could be any of the following: offset joints, root intrusion, mineralization, infiltration of groundwater, observation of debris, cracks and shatters in the pipe and laterals, etc. GIS is being used more now also because of its effectiveness in plotting geographical points of interest (manholes, curb inlets, grates, pump stations, etc.). After the all points are plotted, the user can identify manhole numbers by their GPS numbers.
- Repair and monitor all potential leaks near the wellfield recharge areas.





### **PSOC # 3 Transportation Corridors Route 140**

Route 140 is the only major transportation corridor running through the Pleasant Valley Zone II.

### **Strategies for PSOC # 3 Transportation Corridors Route 140**

Please see the PSOC section for Transportation Corridors in the Oakdale Well 01G portion of this plan for the Strategies and BMP practices that also apply to the Pleasant Valley Zone II residences.

Also see the **Resources** section at the end of this plan for more information.

### **PSOC # 4 Electric Transformer Station**

Transformers are essential for high voltage power transmission, which makes long distance transmission economically practical. Transformer oil or insulating oil is usually a highly-refined Mineral Oil Dielectric Fluid (MODF) that is stable at high temperatures and has excellent electrical insulating properties. Mineral Oil Dielectric Fluid can be toxic to drinking water and may also contain Polychlorinated biphenyls (PCB's).

PCB's are highly persistent, bioaccumulative and toxic chemicals, which were once commonly used as dielectric fluids in electrical equipment. A federal ban on the manufacturing of PCBs was passed in 1979. The Toxic Substances Control Act allows the continuing use of certain PCB bearing equipment, but the disposal of the oils from this equipment is strictly regulated.

When transformer manufacturers switched from PCB to non-PCB fluids, the new transformers were often filled using the same equipment that had been used for PCB's. The result was that some newer transformers were contaminated with various levels of PCB's.

### **Strategies for PSOC # 4 Electric Transformer Station**

- Contact National Grid to determine if any of the transformers in the Zone II contain Polychlorinated biphenyls (PCB's) or other potential water source contaminants.
- If necessary, collaborate with the utility company to create a transformer phase-out program.
- Partner with the DPW to create an electrical transformer monitoring program for potential leaks and management of trees, limbs and other hazards.
- Partner with the DPW to utilize a Global Position System (GPS) to mark all transformers located within the Zone II and to create and disseminate transformer location maps to the Selectboard, DPW, Police Department and Fire Department.

### **PSOC # 5 Former Town Landfill**

According to the MassDEP Solid Waste Program, the West Boylston Former Town Landfill at 35 Worcester Street has been closed since 1986. It was capped and certified on 1/13/1995 and is not lined.

Even after a landfill stops accepting material, Massachusetts solid waste management facility regulations (310 CMR 19.000) require the owner and operator to properly maintain the site for up to 30 years. Owners and operators must ensure that leachate or runoff does not contaminate water resources, and gas generated as buried waste continues to decay does not pose an explosion hazard.

Facility owners and operators, including municipalities, must obtain MassDEP approval of detailed plans for closure and long-term maintenance of inactive landfills.

When a municipality closes a landfill in accordance with a plan approved by MassDEP, the city or town is required to inspect, maintain, monitor and report to the agency on the condition and integrity of:

- Landfill liner and final cover systems
- Landfill gas control and leachate collection systems
- Ground water, surface water and air monitoring systems
- Access roads and surveyed benchmarks

The potential for contamination from former landfills can be great if a water source is near the site and plumes of toxic materials in the leachate can be drawn into the cone of depression when the well is in use. The Pleasant Valley Well 05G Zone II does encompass the former landfill, but is located very close to the landfill, therefore the potential for contamination from this source is probably low. Landfills are capped with impervious material to prevent precipitation from leaching through the garbage and leaking into the groundwater.

### **Strategies for PSOC # 5 Former Town Landfill**

Common Compliance Issues:

Violations commonly observed by MassDEP at closed and inactive municipal landfill sites include failure to:

- Close inactive landfills in accordance with plans approved by MassDEP and ensure that the closures were certified by the agency.
- Meet obligations for post-closure inspection, maintenance and monitoring, and submit required reports to MassDEP. Obligations include semi-annual sampling and analysis of groundwater and surface water samples, and quarterly sampling for landfill gas.
- Maintain systems supporting required long-term care of inactive landfill sites.
- Record a notice of the landfill's existence on the deed to the property on which it is located.

### **PSOC # 6 Railroad/ Electric Utility Corridor**

A railroad, owned by PanAm runs through along the western border of Pleasant Valley 05G Zone II. 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. Work with local officials in West Boylston during their review of the railroad and the National Grid utility right-of-way.



*PanAm Railroad and National Grid Utility Corridor running side by side along the western edge of the Pleasant Valley Well 05G Zone II.*

Yearly Operating Plans (YOP) to ensure that water supplies are protected during vegetation control or maintenance of the utility. The MassDEP Pesticide Bureau prohibits Railroads from using certain hazardous chemicals within the Zone I and II.

### **Strategies for PSOC # 6 Railroad/ Electric Utility Corridor**

- It is recommended that the West Boylston Water District work with its Conservation Commission in approving the Railroads and Utility Management Yearly Operating Plans (YOP). A map depicting West Boylston's wetland locations and Zone II locations will indicate where the railroad must comply with low spraying applications of herbicides.
- Review the railroad right-of-way Yearly Operating Plan to ensure Best Management Practices (BMP's) are implemented with regard to vegetation control in the Zone II and that the utility has accurate information regarding the locations of the wells and the Zone I. Review the maps the utility uses and supply them with an accurate map as appropriate.
- Work with the Emergency Management Director to review Emergency Response Plans. Updates to this plan should include the railroad right-of-way including coordination with the owner/operator of the track and trains using the right-of-way. Request emergency response teams to coordinate emergency response drills and practice containment of potential contaminants from train accidents with the Zone II, which should attempt to include representatives from the owner/operator of the trains utilizing the right-of-way.

## Protection and Management of the Wellhead Protection Area

### Regulatory Strategies

#### Zoning

West Boylston's public water supply Zone II's are zoned mostly as Single Residence (SR) with the exception of the Business District (B) in the center of the Oakdale section of West Boylston and the small section of the Pleasant Valley Zone II that is zoned for Industrial (IND) use. The small portion in the Town of Sterling is unlikely to be affected by Sterling's zone code.

The Lee Street Well 04G has a portion of its Zone II in the Town of Holden. The Holden portion of the Zone II has zoning of Suburban 1 (S1) and Suburban 2 (S2). The S2 section of Holden appears to be densely built suburban subdivisions. The S1 section appears to be less densely built out. The presence of wetlands throughout much of the Zone II in the Holden section and the extensive amount of protected open space owned by the Massachusetts Department of Conservation (DCR) prevents any dense development from occurring.

The Zone II for the Pleasant Valley Well does have a small portion along its southwest corner where the Town's Industrial District lies within the Zone II.

#### Aquifer and Watershed Protection District

The Town of West Boylston does have an Aquifer and Watershed Protection District (AWPD) that helps to protect the Zone I and II from any use not in character with protecting the public water supply. Please refer to **Map 9: Zoning West Boylston Zone II Recharge Area**.

According to the 2009 Open Space and Recreation Plan, West Boylston residents were concerned with protection of its water supplies, the town first passed an Aquifer and Watershed Protection District Zoning Bylaw in 1986. The Bylaw was amended in 1994, when the state and federal drinking water regulations were made more stringent. Within this Aquifer Zone, lots must have 50,000 square feet, 150 feet of frontage, and can only have 15 percent impervious coverage (including half of the abutting roadway), whereas in other areas the minimums are 40,000 square feet, 120 feet of frontage, and no limit to impervious coverage. (These more stringent aquifer zoning requirements have not, however, always been upheld by the town.)

The Aquifer and Watershed Protection Zoning District is an overlay, superimposed on the existing zoning districts, and it applies only to future uses. Certain activities, which are considered potential threats to the water supply, are prohibited within the District. Such activities include landfills, open dumps, and storage of hazardous waste, liquid hazardous materials and petroleum products except under rigidly controlled circumstances. Other activities are allowed only with a special permit.

The land covered by the overlay is then subject to both the existing zoning and the water supply protection regulations. See Appendix A for a copy of West Boylston's Water Supply Protection District.

**Floor Drain Regulation**

The Town of West Boylston local protection controls do not fully meet 310 CMR 22.21(2) through the adoption of a non-zoning floor drain control. It is recommended that the Town of West Boylston adopted a non-zoning floor drain control pursuant to 310 CMR 22.21(2)(a)(8). Please see Appendix B: Planning and Implementing a Local Floor Drain Control for more information about how to adopt a floor drain control for the Zone II.

There are several businesses within the Oakdale Zone II in the business center along Main/Thomas Street that should be inspected for open floor drains they include:

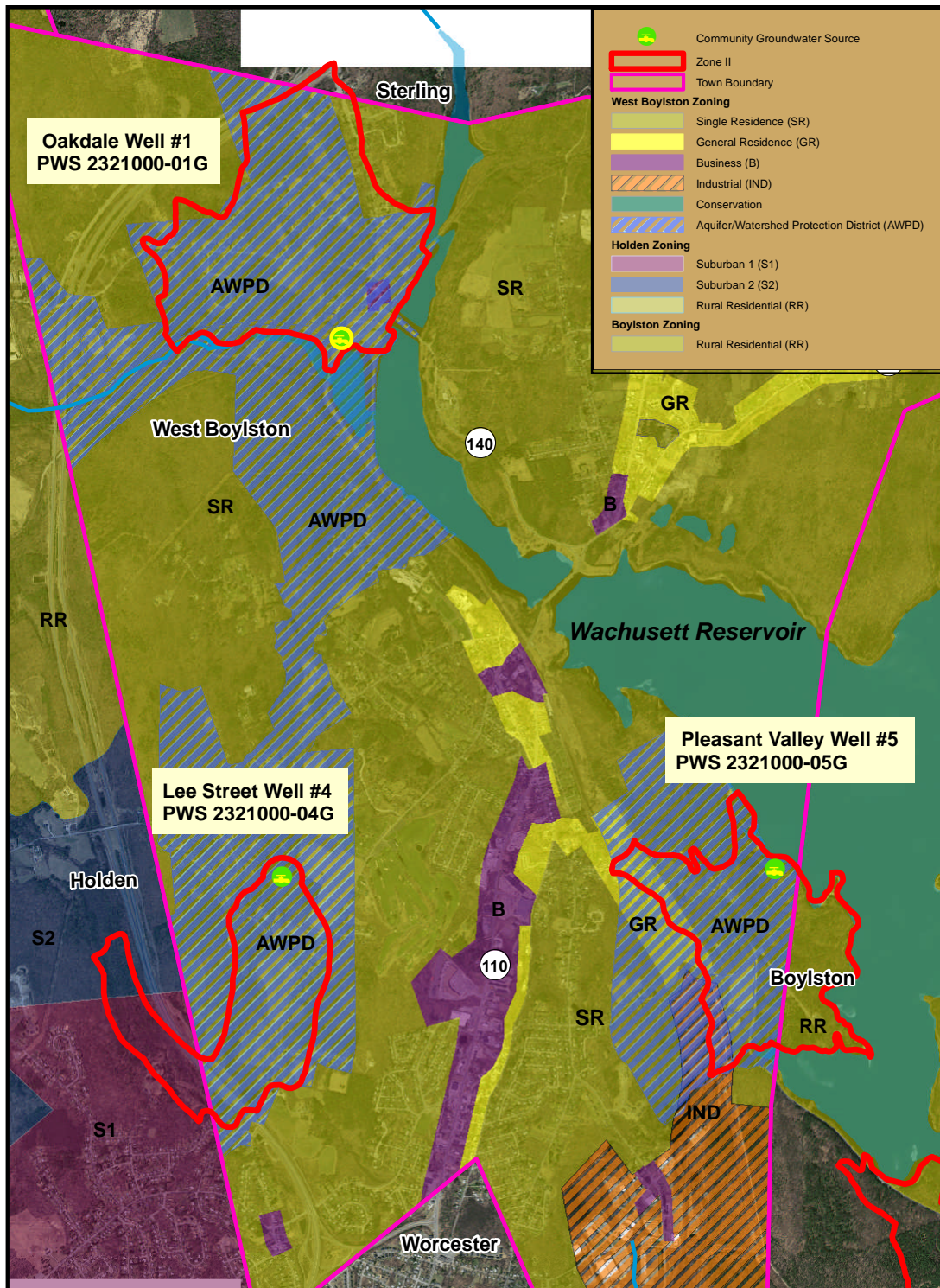
- 1. Oakdale Rehabilitation and Skilled Nursing Center**
- 2. R.E. Chapman Co. – This drain was reported to be closed by the Fire Department, but the Source Water Committee recommends a current inspection.**
- 3. Jacqueline's Hair Salon**

**Water Use Conservation Bylaw**

The West Boylston Water District has a Drought Management Plan and a Water Use Restriction Bylaw. Please see Appendix A for a copy of the Bylaw. The Drought Management Plan can be accessed at the West Boylston Water District's website at:

<http://westboylstonwater.org/>





**Map 9: West Boylston Zoning for Aquifer/Watershed Protection District**

Scale – 1:35,000

(See legend above on map)

Source(s): MASSGIS Datalayers/Town of West Boylston –Author:RJM Date: 2/11

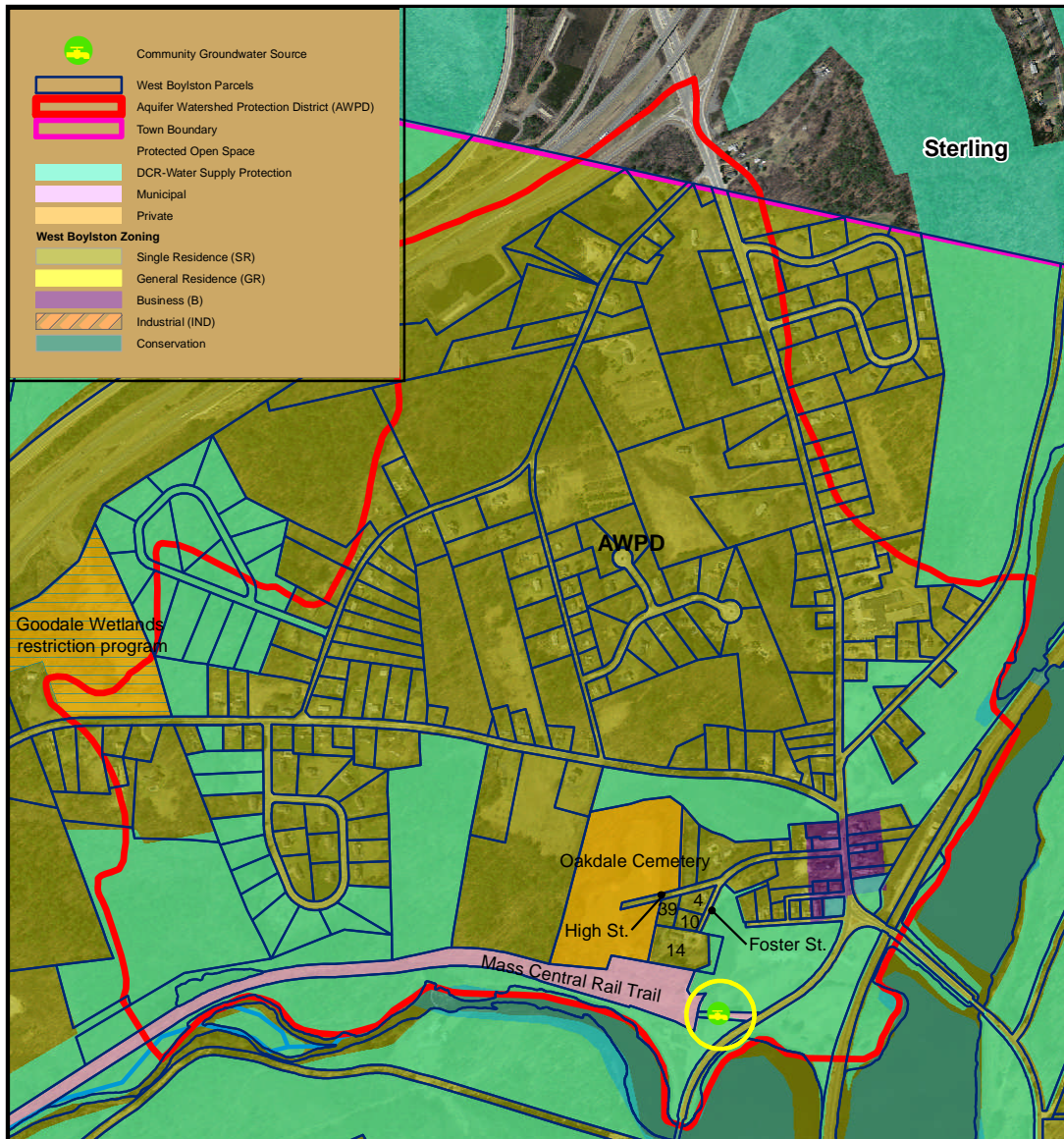




## Protected Open Space/ Priority Parcels

The Town of West Boylston has a significant amount of protected open space, mainly through the Massachusetts Department of Conservation's (DCR) Water Supply Protection for the Wachusett Reservoir.

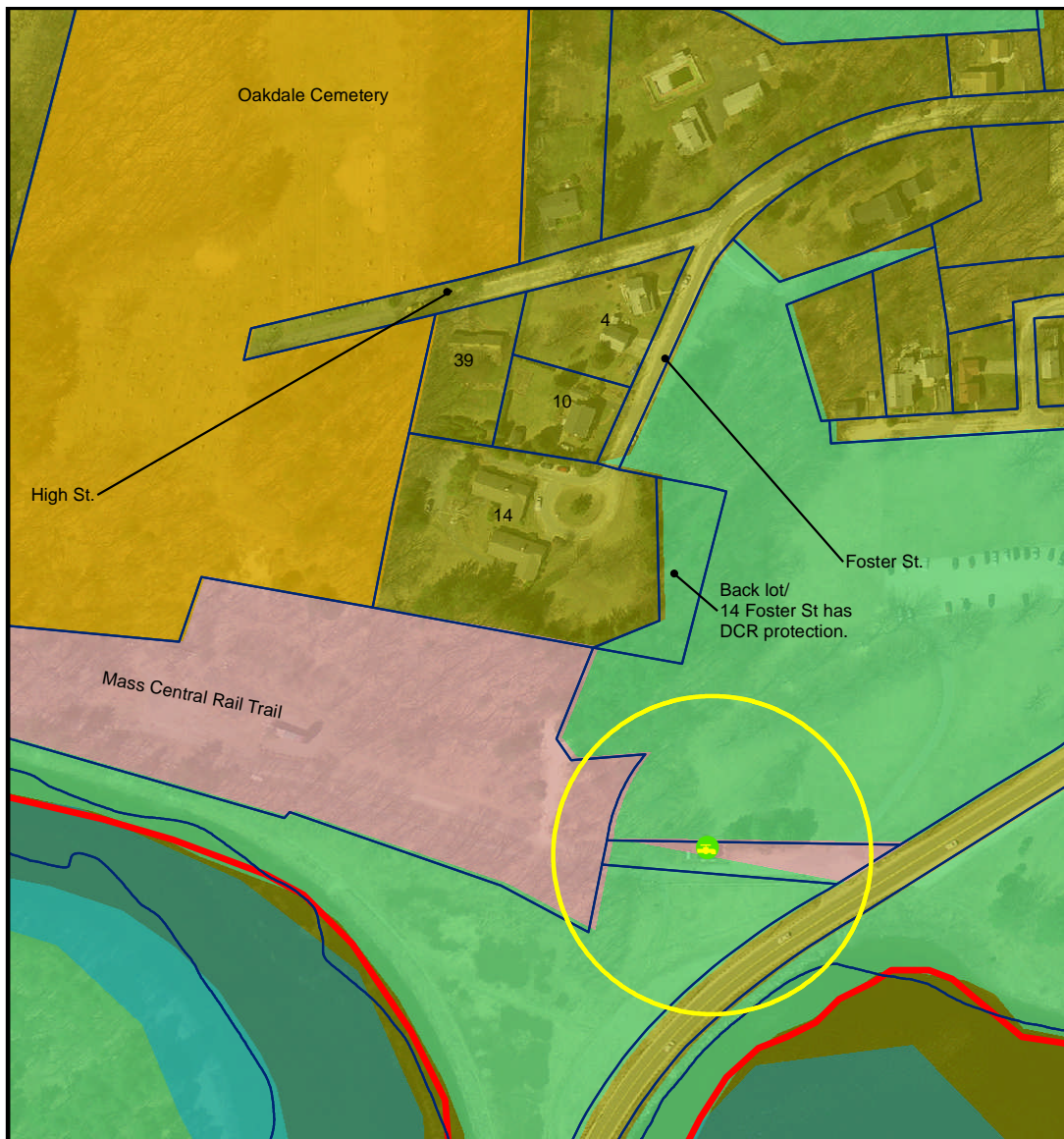
### Oakdale Well 01G Protected Open Space



Scale – 1:11,500 **Map 10: Oakdale Well 01G Protected Open Space**

Source(s): MASSGIS Datalayers –Author:RJM Date: 1/11





Scale – 1:2,500

**Map 11: Oakdale Well 01G Priority Parcels**

Source(s): MASSGIS Datalayers –Author:RJM Date: 1/11



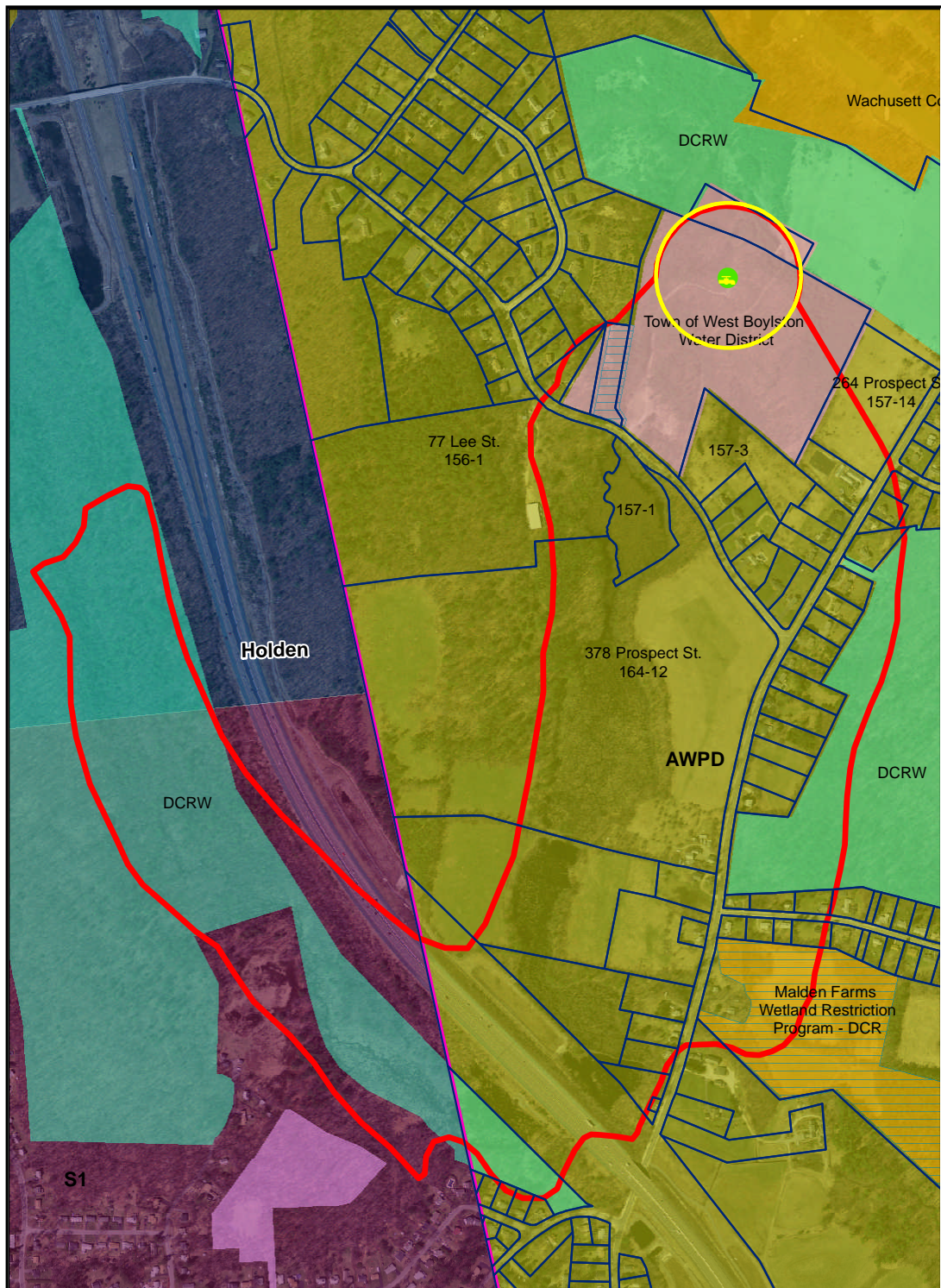
**Table 7: Oakdale Well 01G Priority Parcels**

Parcel owner/address	Map/ Parcel #	Acres
14 Foster St.	123-5.2	1.78
10 Foster St.	118-13	.37
4 Foster St.	118-14	.52
39 High St.	118-15	.44

The DCR has permanently protected several parcels near West Boylston’s Oakdale Well 01G. **Table 6: Oakdale Well 01G Priority Parcels** provides parcel information for the West Boylston Water District and the DCR as to which parcels are most important to protect should the opportunity arise.



## Lee Street Well 04G Protected Open Space/ Priority Parcels



Scale – 1:9,500

**Map 12: Lee Street Well 04G Protected Open Space/ Priority Parcels**

Source(s): MASSGIS Datalayers –Author:RJM Date: 1/11



**Table 8: Lee Street Well 04G Priority Parcels**

Parcel owner/address	Map/ Parcel #	Acres
77 Lee St.	156-1	29.8
0 Lee St./ Same owner as 77 Lee St.	157-1	4.3
0 Lee St.	157-3	5.5
264 Prospect St.	157-14	7.6
398 Prospect St.	164-12	73.8

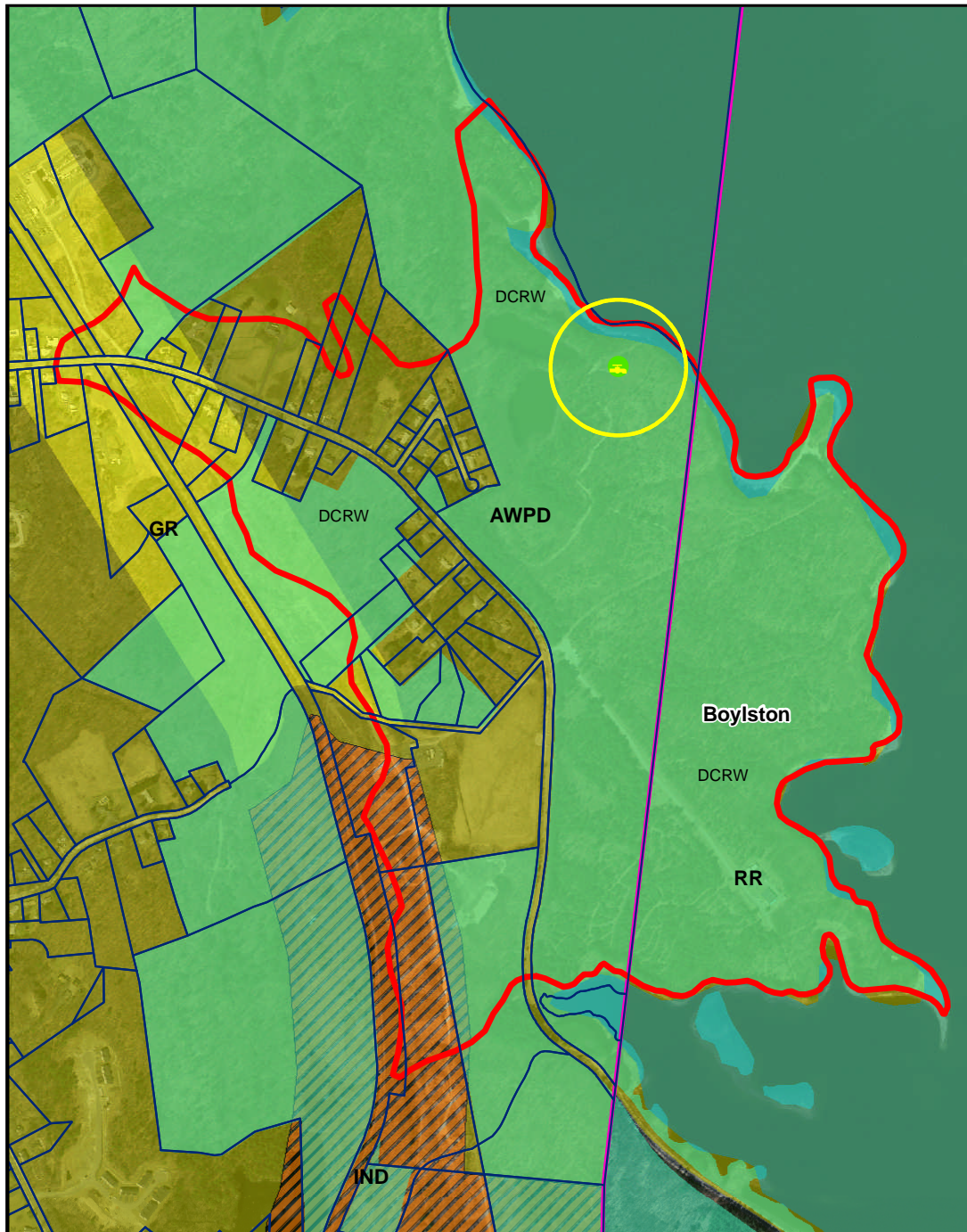
The DCR has permanently protected three parcels within the West Boylston's Lee Street Well 04G. **Table 7: Lee Street Well 04G Priority Parcels** provides parcel information for the West Boylston Water District and the DCR as to which parcels are most important to protect should the opportunity arise.

The Town of West Boylston has just secured for protection (in 2010) parcel 157-3 abutting the Town of West Boylston Water District's Lee Street 04G wellfield. The Town and the Greater Worcester Land Trust combined funding to purchase the Conservation Restriction (CR) on this property.

According to the DCR, they are in the process of purchasing DCRW protection for 77 Lee Street, parcel 156-1. The process should be completed sometime in 2011.



### Pleasant Valley Well 05G Protected Open Space



Scale – 1:10,500 **Map 13: Pleasant Valley Well 05G Protected Open Space**

Source(s): MASSGIS Datalayers –Author:RJM Date: 1/11



There is a significant amount of land that is permanently protected by the DCR surrounding the Pleasant Valley Well 05G. The West Boylston Water District Source Water Protection Committee determined there were no priority parcels for this area.

## **Non-Regulatory Strategies**

### **Septic System Inspection and Outreach Program**

Improperly functioning or failing septic systems can contribute viruses, bacteria, nitrates, and chemical compounds to groundwater. Proper maintenance will prevent costly problems in the future and prevent contamination of nearby drinking water supplies as well as other water resources such as rivers, ponds, and wetlands.

Some communities have implemented Septic System Inspection and Outreach Programs through their Water District or Board of Health to reduce the threat an improperly functioning septic system poses to groundwater. Such a program involves voluntary participation by the landowner. To encourage participation, it is important to establish at the outset that the goal of the program is not to penalize or fine property owners, but to work cooperatively to ensure the protection of our water supply.

#### **Recommendations:**

- 1. Enlist voluntary homeowner participation in septic system inspection program.**
- 2. Assist homeowners in getting financial assistance for failing septic systems.**
- 3. Conduct public education and outreach about septic system care and maintenance.**
- 4. Encourage residents to pursue group rates for pumping or enlist the Board of Health in creating group rate structures with local technicians.**

How to Establish a Septic System Inspection and Outreach Program:

#### **1. Inspect Septic Systems Regularly**

The Water District, or Board of Health, generates a list of all properties and landowners within the WSPD that have septic systems. Landowners are contacted by mail or telephone to request their voluntary participation in a quarterly (or some other regular interval) inspection.

A visual inspection for odor, seepage or lush green growth is performed. If any of the symptoms of an improperly functioning septic system are present, the inspector recommends that the homeowner consult a licensed wastewater disposal engineer for a more in depth evaluation of the problem.

Because the program is purely voluntary, some property owners may opt not to participate fearing financial repercussions. The town should contact local septic system pumping contractors to request that they notify the Board of Health if any of the above described symptoms are observed so that the town can get involved.

## **2. Town Assists in Procuring Financial Assistance for Homeowner Septic System Repair**

The town provides assistance to property owners in contacting appropriate sources of financial assistance for septic system repair. The Commonwealth of Massachusetts has developed programs to assist homeowners with wastewater management problems. The following financial assistance information was provided by the Department of Environmental Protection's Bureau of Resource Protection.

### ***A. Massachusetts Housing Finance Agency (MHFA) Homeowner Septic Repair Program***

Homeowners of low and moderate income are eligible. Approval is dependent on good credit and stable income. While income guidelines are geographically indexed, households of one or two with annual income of up to \$46,000 and households of three or more with annual income of up to \$57,000 generally are eligible. Homeowner Septic Repair Loans are available to eligible homeowners as low interest rates of 0%, 3%, and 5%, depending on income, for loans ranging in size from \$1,000 to a maximum of \$25,000.

More information about this financial assistance can be obtained from MFHA at One Beacon Street, Boston, MA 02108, (617) 854-1020.

### ***B. Tax Credit***

The Septic Tax Credit is a credit equal to 40% of the actual costs incurred in the repair or replacement of a failed septic system. The expenses are the lesser of the taxpayer's actual costs paid to repair or replace the system, or \$15,000. The maximum credit amount that can be claimed in any tax year is \$1,500. Any excess credit amount may be used in the five tax years following the year in which the credit was initially claimed. The total amount of credit that may be claimed by the owner for a residential property is \$6,000. Schedule SC (Septic Credit) Forms are available from the Department of Revenue. This information is based on 2001 Department of Revenue Septic Credit Program.

## **3. Conduct Public Education and Outreach**

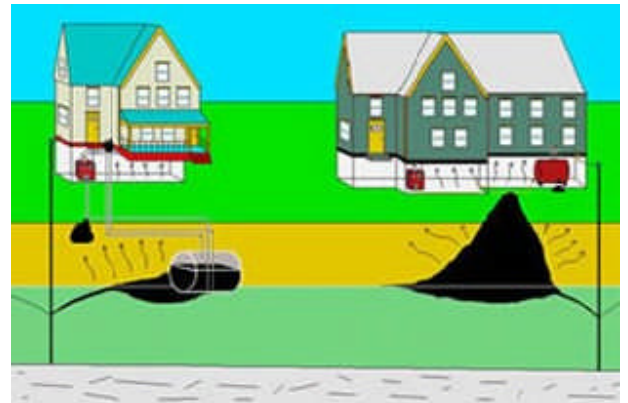
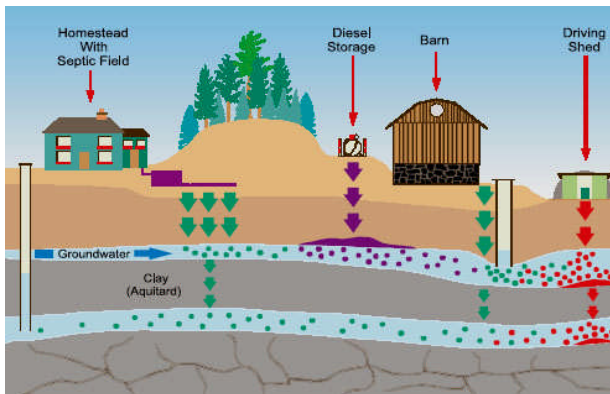
Some objectives of the outreach are to inform septic system owners of how a septic system works, how to care for it, what not to put in it, and the connection between septic systems and groundwater. If these objectives are achieved, the Town's drinking water supply is much less likely to be contaminated by wastewater.

Public education and outreach about septic systems should be conducted at regular intervals throughout the year. Once the list of all septic system owners within the Zone II is generated, a mailing containing information about the Town's voluntary septic system program and an educational flier published by the National Small Flows Clearinghouse (NSFC) entitled *Groundwater Protection and Your Septic System* can be sent to homeowners.

This information should also be made available at public buildings and storefronts around town. Periodically change the literature available in public locations and/or insert new fliers with the water bills. The NSFC also produces a video called *Your Septic System: A Reference Guide for Homeowners* that can be shown on local cable access television. The video can also be made available at the public library. Literature should also be provided to homeowners during inspections.

**Table 9: Septic System Outreach Materials**

Source	Materials
National Small Flows Clearinghouse West Virginia University P.O. Box 6064 Morgantown, WV 26506-6064 (800) 624-8301 (304) 293-4191 <a href="http://www.nsfc.wvu.edu">www.nsfc.wvu.edu</a>	Groundwater Protection and Your Septic System Item #WWBRPE21 pamphlets  The Care and Feeding of Your Septic System Item #WWBRPE18 pamphlets
MassDEP website: <a href="http://www.mass.gov/dep/water/drinking/source.htm">http://www.mass.gov/dep/water/drinking/source.htm</a>	Your Septic System: A Reference Guide to Homeowners Pamphlet and Video



*Common contamination sources of public and private water supplies.*

It is recommended that the Town of West Boylston's Water District regularly participates in septic outreach programs and promotes septic repair.

### **Automotive Waste Oil**

The proper disposal of automotive waste oil generated by homeowners and small businesses within the WSPD and for private wells is very important. Used motor oil should always be recycled - never thrown in the trash, dumped on the ground, or poured into the sewer or down the drain. Used oil contains heavy metals, which can contaminate water supplies and harm the environment. It doesn't take much to do a lot of damage. One gallon of used oil can pollute one million gallons of drinking water. One pint can produce an oil slick the size of a football field.



Under Massachusetts law, automotive stores must accept containers of used motor oil that they sell to individual customers if accompanied by a receipt. Sears Automotive, some Mobil and Exxon stations, and Valvoline Instant Oil Change will accept used oil without a receipt. The MassDEP Used Oil Hotline can provide the location of the nearest drop off location at (617) 556-1022 or visit the car oil recycling website at [www.recycleoil.org](http://www.recycleoil.org).

The Town of West Boylston's transfer station has a waste oil repository for its residents.

#### **Recommendation:**

- 1. Inform public about appropriate methods and locations for disposal of automotive waste oil with the use of a flier and displays around town.**
- 2. Educate residents and business owners about potential contamination issues associated with floor drains.**

### **Sample Homeowner Survey**

Sending out a survey to assess septic system and fuel oil tank conditions are recommended. Once the survey is complete, the Town should have a better understanding of whether home heating oil storage, floor drains, and abandoned wells pose a tangible threat to their aquifers. Based on the results, the Town would seek an appropriate course of action to reduce or eliminate the threat to the aquifer. Possible actions include, capping abandoned wells, replacing deteriorating heating oil storage tanks, and sealing illegal floor drains.

#### **Recommendations:**

- 1. Survey landowners about home heating oil storage, abandoned wells, and residential floor drains.**
- 2. Based on results of survey, contact landowners about removing threats to the aquifer.**



As part of West Boylston's ongoing efforts to protect our public and private water supply and ensure safe, clean drinking water for our community, we are conducting a survey about common structures that you may or may not have on your property. This information will help us better understand what direction our water supply protection and planning efforts should take. If you have questions please call the Board of Health at *insert number*. Please return in the enclosed self-addressed and stamped envelope by *insert date*.

1.) Do you use oil to heat your home? Yes\_\_\_\_ No\_\_\_\_  
If you answered yes, please include the following information about your heating oil storage tank: age or date installed \_\_\_\_\_ size of tank \_\_\_\_\_  
model or manufacturer \_\_\_\_\_ material made of \_\_\_\_\_  
location \_\_\_\_\_  
condition new \_\_\_\_\_ good \_\_\_\_\_ fair \_\_\_\_\_ poor \_\_\_\_\_  
Would you be interested in financial assistance to replace or update your tank?  
Yes \_\_\_\_ No \_\_\_\_

2.) Do you have any wells on your property that are no longer in use? Yes \_\_\_\_ No \_\_\_\_  
Have they been sealed or capped? Yes \_\_\_\_ No \_\_\_\_  
With \_\_\_\_\_ what \_\_\_\_\_ materials?  
\_\_\_\_\_

3.) Do you have floor drains in your basement, garage, barn, or other building on your property?

Yes \_\_\_\_ No \_\_\_\_  
If yes, please explain the location, design of the drain, and to where the drain empties.

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## Land Protection Strategies

Residential and commercial developments, with all of its associated land uses, are the biggest threats to a drinking water supply. Their contamination is slow and insidious, often overlooked until a crisis is thrust upon the community, usually requiring a lot of money that no one has to fix. Residents value the areas of their town that are rural. Rural landscape provides many benefits including wildlife habitat, aquifer/surface water recharge, farmland, and aesthetic beauty. It is critically important that town officials discuss alternatives to development with landowners to preserve open space.

## **CHAPTER 61 “Chapter Lands”**

This is a tax relief program that is designed to give favorable treatment to land owners that are willing to manage their land for:

- Timber products: Chapter 61, lands taxed at only 5% of fair market value.
- Agriculture or Horticulture: Chapter 61A, for working or family farms. Tax rate determined by the Farmland Valuation Advisory Committee.
- Natural Resources and Recreation: Chapter 61B, lands taxed at 25% of fair market value.

There is a minimum acreage requirement for each program. Land must be registered each year at the Assessor’s office and you must agree to leave the land in the program for a certain number of years. There are financial penalties for sudden withdrawal from the program, but no penalties for allowing this tax status to expire. Chapter lands are not permanently protected.

## **AGRICULTURAL PRESERVATION RESTRICTION (APR)**

This is a state funded program used to protect the states prime and important agricultural lands. It may provide permanent protection to working farms and orchards, though in some cases an APR can be undone. It is a voluntary program, but the application process is slow and requires a patient land owner. The state pays the difference between the fair market value and the agricultural value of the land. The landowner agrees to a permanent deed restriction that protects the land from uses that would have a negative impact on its use for agricultural purposes.

## **CONSERVATION RESTRICTION (CR)**

Although a little complex, **this is a powerful tool for all land owners** who wish to permanently protect all or part of their property. The terms of the agreement are determined by the landowner.

- It is a voluntary agreement in which a landowner limits uses (e.g. development) while retaining private ownership.
- Landowners use land preservation agreements to protect a property’s natural and scenic features.
- Significant federal income and estate tax benefits as well as local real estate tax benefits can result from granting a land preservation agreement.
- A qualified appraisal must be done on the land to determine the amount of the deduction and the value of the agreement.
- Land owners can sell or give away the property after the agreement has been placed on the land.
- All future owners are bound by the terms of the agreement.
- Every agreement is unique, tailored to a particular land owner’s goals and land.
- Land preservation agreements can be donated or sold to a non-profit entity such as a local land trust, conservation commission, a public water system or a federally recognized charity under IRS Code Section 501(c)(3).
- The recipient who accepts the agreement is legally bound to enforce the terms of the restriction in perpetuity. In order for the owner to qualify for a tax deduction, the agreement must be perpetual.

- The public does not automatically have access to property protected by a land preservation agreement.
- The agreement holder monitors the property, generally once a year, to assure that the terms are being upheld. Some agreement holders may request an endowment be made to ensure long-term monitoring and enforcement of the restriction.
- To accomplish the donation or sale of a land preservation agreement, the landowner needs to work closely with the organization or government entity that will hold the agreement. That may include:
  - Consulting with legal and tax counsel
  - Tour of the property to evaluate and discuss the easement
  - Approval from the holder's Board of Directors
  - Preparing baseline documentation of the property for monitoring purposes
  - Title search
  - Obtaining a mortgage subordination from the lender if there is an existing lien
  - Negotiating the agreement and drafting the document
  - Obtaining a qualified appraisal
  - Signing and recording the final restriction and legal documents

The MassDEP and Executive Office of Energy and Environmental Affairs (EOEEA) approve Conservation Restrictions (CR). A model CR is available on MassDEP's website at [www.mass.gov/dep/water/drinking/protect.htm](http://www.mass.gov/dep/water/drinking/protect.htm).

Please also see the *Massachusetts Conservation Restriction Handbook* at <http://www.mass.gov/envir/dcs/pdf/restrictions.pdf>.

### **DRINKING WATER SUPPLY PROTECTION GRANT PROGRAM**

The MassDEP also has grant assistance available to purchase land to protect drinking water resources.

For more information on the **Drinking Water Supply Protection Grant Program** please visit the MassDEP website at <http://www.mass.gov/dep/water/dwgrant.htm>.

### **Community Preservation Act**

Community Preservation Act (M.G.L. Ch. 44B) provides Massachusetts cities and towns with a mechanism to protect open space, preserve historic buildings and sites, and create affordable housing. Towns may establish by local referendum a property tax surcharge of up to 3% to help fund these activities. Funds raised locally through the Community Preservation Act (CPA) will be supplemented by state matching funds. At least 10% of CPA funds must be spent on each of the following three activities: open space protection, historic preservation and affordable housing. The remaining 70% may be used for any one or more of these three purposes in accordance with the community's priorities.

Massachusetts towns should consider adopting the CPA to provide a steady source of income for open space protection, historic preservation and affordable housing activities. There are two methods available to adopt the CPA.

First, Town Meeting can vote to place the question of adopting the CPA before the voters as a referendum.

Second, if Town Meeting does not adopt the CPA language at least 90 days before a regular town election or 120 days before a state election, then a petition signed by 5% of the registered voters in West Boylston can be filed to place the question on the ballot.

The CPA will be adopted if the referendum passes by a majority vote. If West Boylston adopts the CPA, the Town may choose to exempt \$100,000 of value for each taxable parcel and/or the full value of residential property owned by low income persons or low and moderate income senior citizens. In addition, the CPA does not affect any other real estate tax exemptions or abatements authorized under M.G.L. Ch. 59 or any other state law. Upon adoption of the CPA, a community must appoint a Community Preservation Committee consisting of between five and nine members, including one member from each of the following: Conservation Commission, Historic Commission, Planning Board, Board of Park Commissioners, and Housing Authority. The Committee makes recommendations to Town Meeting for the use of money in the local Community Preservation Fund. In addition, communities may issue bonds in anticipation of Community Preservation Fund receipts. These funds may be used for:

**Open Space:** Community Preservation funds may be used to purchase land, easements or restrictions to protect existing and future water supply areas, agricultural and forest land, coastal lands, frontage to inland water bodies, wildlife habitat, nature preserves, and scenic vistas. If the community is only spending 10% of its funds on open space, the open space cannot be purchased for recreational use.

**Recreation:** Land can also be purchased for active and passive recreational uses including land for community gardens, trails, non-commercial youth and adult sports, and parks, playgrounds or athletic fields.

**Historic Preservation:** Funds may be used to purchase, restore and rehabilitate historic structures and landscapes that have been determined by the local Historical Commission to be significant in the history, archeology, architecture or culture of a city or town, or that are listed or eligible for listing on the State Register of Historic Places.

**Affordable Housing:** Funds may be used to create and preserve housing for low and moderate income individuals and families, including low and moderate income senior housing. The Act requires the Committee to recommend, wherever possible, the adaptive reuse of existing buildings or construction of new buildings on previously developed sites.

For more information go to <http://www.communitypreservation.org/index.cfm>.

#### **Recommendations:**

- 1. Conduct outreach to landowners about options for protecting open space within the WSPD.**
- 2. Town may take proactive steps to acquire land through the adoption of the Community Preservation Act.**
- 3. Acquire available funds for land purchase through the Commonwealth Capital funding process or the Drinking Water Supply Protection Grant Program.**



**Table 10: Strategies for Protecting Open Space**

	CHAPTER 61	CHAPTER 61A	CHAPTER 61B
<i>PURPOSE</i>	Tax incentive for long-term management of woodland for wood production.	Tax incentive for active agricultural or horticultural uses.	Tax incentive for land in natural, wild, open or landscaped use; or an approved recreational use.
<i>ELIGIBILITY</i>	Minimum of 10 contiguous acres. A continuous commitment to improving the 'quality and quantity' of timber crops on woodlands. Forest management plan approved by state forester.	Minimum of 5 acres "actively devoted" to agricultural and/or horticultural uses at least 2 years prior to classification. Minimum annual gross sales of \$500. Additional contiguous land may also qualify.	Minimum of 5 acres in open space or recreational uses.
<i>TAX ASSESSMENT</i>	Assessed at 5% fair market value, at commercial rate, plus 8% stumpage value of products harvested in prior year.	Assessed at agricultural/horticultural "use" value, at commercial rate. Values assigned by Board of Assessors and may change annually.	Assessed at maximum value of 25% fair market value, at commercial rate.
<i>HOW TO ENROLL</i>	Application package filed with State Forester by June 30. Approved application package submitted to Board of Assessors by August 31. Application good for 10 years.	Annual application filed with Board of Assessors by October 1.	
<i>ENROLLMENT PERIOD</i>	Enrolled until withdrawn from classification and withdrawal penalty paid. Forest management plan updated every 10 years.	Enrolled until sold for or converted to another use, and either conveyance tax or roll-back tax paid. Annual filing with Board of Assessors. Forest management plan updated every 10 years on acres classified as "productive woodlands".	Enrolled until sold for or converted to another use, and either conveyance tax or roll-back tax paid. Annual filing with Board of Assessors.
<i>WITHDRAWAL OR CHANGE OF USE PENALTY</i>	Penalty payment depends on number of years in the program, and is difference between taxes paid under Chapter 61 and what would have been paid if not classified, plus interest. Annual forest products tax credit may or may not be applied to withdrawal penalty,	Conveyance or roll-back tax imposed, but not both. Conveyance tax rate applied when land sold for a non-qualifying use, decreasing from 10% to 1% over first 10 years of ownership. Roll-back tax is difference between taxes paid under Chapter 61A and what would have been paid if not classified, with no interest. Roll-back tax imposed for 5 prior years.	Conveyance or roll-back tax imposed, but not both. Conveyance tax rate applied when land sold for a non-qualifying use, and is 10% for first five years of ownership and 5% for second 5 years. Roll-back tax is difference between taxes paid under Chapter 61B and what would have been paid if not classified, plus interest. Roll-back tax imposed for 10 prior years.
<i>TOWN'S RIGHT OF FIRST REFUSAL</i>	Town has first right of refusal when land sold or converted to residential, commercial, or industrial use. Option lasts for 120 days unless waived. Exception allowed for residential use by family member.		

	CONSERVATION RESTRICTION	AGRICULTURAL RESTRICTION	PRESERVATION ESTATE PLANNING
PURPOSE	To limit the use of land in order to protect specified conservation values including the natural, scenic, or open condition of the land.	To permanently protect farmland by paying landowners the difference between "fair market value" and the "agricultural value" of their land in exchange for a permanent deed restriction which precludes any use of the land that will have a negative impact on its agricultural viability.	To protect your land in a way that makes good financial sense for you and your family.
ELIGIBILITY	Conservation Restriction must demonstrate public benefit	Farm must be at least five acres in size; devoted to agriculture for the two immediately preceding tax years; at least \$500 gross sales per year; soil suitability for agriculture; degree of threat to the continuation of agriculture; potential economic viability of agriculture at that site; and, proximity to other APR lands.	Decisions to protect land require careful consideration of the special features of your property, your land conservation goals, your financial situation, and your family's needs and wishes.
TAX ASSESSMENT	Tax assessment varies by town and by the type of restriction. Call the Town Assessor for details on tax abatement.	The land is eligible for farmland tax assessment under Chapter 61A, and under the APR program, it will continue to be eligible as long as it is "actively devoted" to agriculture. The landowner should apply to the local assessor each year prior to October 1 and the tax will be based on the current farm use. Dwellings and their lots and farm buildings will continue to be taxed as other real estate.	Federal estate taxes can be as high as 55% of a property's fair market value. The following options provide tax relief: outright land donation, donation of undivided partial interests, donation of land by will, donation of remainder interest in land with reserved life estate, bargain sale of land to a land trust or conservation agency, lease, and mutual covenant. Conservation restrictions are also appropriate estate planning tools.
HOW TO ENROLL	Conservation restrictions must be submitted according to the written procedures of and approved by the Secretary of Environmental Affairs.	Once a completed application is received by the Dept. of Agricultural Resources, it is reviewed and a field inspection is completed within 1 to 2 months. Applications reviewed on a rolling basis. Priorities are established based upon above eligibility requirements. Timing of acquisition depends on availability of funds.	Because land conservation is a technical area of the law and because your decisions can have significant consequences, it is important to seek out advisors who are experienced in this field. Consult one of the listed resources below, a local land trust, tax accountant, or lawyer with appropriate experience.
ENROLLMENT PERIOD	Allowed for a period of years written into the restriction or in perpetuity. Less than perpetual restrictions will be approved only where demonstrated critical public interest exists.	In perpetuity	N/A
WITHDRAWAL OR CHANGE OF USE PENALTY	Withdrawal or change of use is very difficult. Conservation Restrictions should only be considered if they are to be in perpetuity or for a designated term written into the easement. There can be serious tax penalties for withdrawal from a conservation restriction.	Releasing an APR is very difficult and requires three steps: the Commissioner of the Dept. of Agricultural Resources must determine the land is no longer fit for agriculture, a 2/3 vote of the state legislature must approve the release (MGL Article 97), and landowner must reimburse the State for the value of the APR at today's value. A change in use other than stated in the APR also requires a 2/3 vote of the state legislature.	N/A
TOWN'S RIGHT OF FIRST REFUSAL	N/A	N/A	N/A
FOR MORE INFORMATION	MA Executive Office of Energy and Environmental Affairs Division of Conservation Services 617-626-1012	Dept. Agricultural Resources 617-626-1700	Valley Land Fund 413-585-8513; Preserving Family Lands by Stephen J. Small available from Landowner Planning Center, PO Box 4508, Boston, MA 02101-4508

## Public Education and Outreach

Public education and outreach are some of the most important actions a community can take to protect their water supply. Much of the information presented throughout this report is not simply known by all homeowners. This information needs to be passed on to the public so that they can engage in best management practices for protecting West Boylston's public and private water supplies. The sources of potential contamination to West Boylston's drinking water supplies, as well as public education and outreach recommendations, were presented at a Source Protection Workshop on March 15, 2011.

Please also note the **Resources** section included at the back of the West Boylston Source Water Protection Plan for additional education resources.

**Table 11: Internet Reference Sites for Educational Material**

Massachusetts Department of Environmental Protection Source Water Protection Materials	<a href="http://www.mass.gov/dep/water/drinking/sourcewa.htm">http://www.mass.gov/dep/water/drinking/sourcewa.htm</a>
State of Massachusetts Community Recycling Information-Earth 911	<a href="http://massachusetts.earth911.org">http://massachusetts.earth911.org</a>
Household Hazardous Waste Links Massachusetts	<a href="http://www.state.ma.us/dep/recycle/hazards/hhwhome.htm">www.state.ma.us/dep/recycle/hazards/hhwhome.htm</a>
EPA Recycling and Waste Homepage	<a href="http://www.epa.gov/epaoswer/osw/">http://www.epa.gov/epaoswer/osw/</a>
Hazardous Waste Publications	<a href="http://www.epa.gov/epaoswer/non-hw/muncpl/hhwpubs.htm">http://www.epa.gov/epaoswer/non-hw/muncpl/hhwpubs.htm</a>
Car Oil Recycling	<a href="http://www.recycleoil.org">www.recycleoil.org</a>
Disposal and Management of Leftover Paint	<a href="http://www.paint.org/con_info/leftover.cfm">http://www.paint.org/con_info/leftover.cfm</a>
Non-Toxic Cleaning in the Home	<a href="http://www.ns-products.com/nontox.htm">http://www.ns-products.com/nontox.htm</a>
Recycling Grass Clippings and Composting	<a href="http://www.state.ma.us/dep/consumer">http://www.state.ma.us/dep/consumer</a>

## Emergency Response/ Contingency Planning

### Current Plans

The West Boylston Water District has an Emergency Response Plan completed during 2010 by Northeast Geoscience, Inc. The Emergency Response Plan, required by the MassDEP prepares the Town of West Boylston for immediate action in the case of a hazardous spill that could potentially contaminate or harm the public drinking water supply. Immediate response and concerted efforts to contain the spill by the West Boylston Water, Fire and Police Departments, and the Department of Environmental Protections Spill Response Team, is the objective of the Emergency Spill Response Plan. The West Boylston Emergency Response Plan can be found at the Department of Public Works and the Town offices in West Boylston.

### Alternative Supply/ Contingency Planning Evaluation

In the event of a water supply emergency, alternative supplies need to be established in order to provide the community with adequate water. The alternative supply sources that were evaluated include emergency interconnections, bottled water and civil defense water provisions. Potential emergencies include mechanical failure of the distribution system or contamination at the water supply source.

The Town has 4 storage tanks with approximately 3 million gallons of water storage, which in the case of an emergency could supply customers for approximately 3 days under current delivery conditions. In the event of an emergency the Water District will use media contacts to notify the public.

The Water District does belong to the Massachusetts Water/Wastewater Agency Response Network (Mass WARN).

If an emergency were extended, additional measures would be required to meet system demands. These measures include either purchasing bottled water and distributing to consumers accordingly or contacting the civil defense for the utilization of water wagons. Poland Springs, a local water supplier will be contacted for additional resources if needed.

The Emergency Management Director for the West Boylston Water District, Michael Convney, would also contact the Massachusetts Emergency Management Authority (MEMA) if necessary. MEMA can notify the National Guard or give names of other bulk water suppliers. The National Guard has potable water bladder units that could be transported to the site.



## References

Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program. February 26, 2002. *Source Water Assessment and Protection (SWAP) Report for West Boylston Water District*.

Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program. *Sanitary Survey 2008*.

Massachusetts Department of Environmental Protection, December 1997, *Making Wellhead Protection Work in Massachusetts*.

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup. Assessed 2011. Hazardous waste spills, West Boylston, MA. Available at: <http://mass.gov/dep/bwsc/sites/report.htm>

Massachusetts Geographic Information System. Assessed 2010/2011. Executive Office of Environmental Affairs, Commonwealth of Massachusetts.

Earth Tech. December 2000, *Source Water Assessment Program Conceptual Zone II Delineation Oakdale Well West Boylston Water District West Boylston, MA*. Final Report.

Earth Tech. July 1999, *Source Water Assessment Program Conceptual Zone II Delineation Pleasant Valley Well West Boylston Water District West Boylston, MA*. Final Report.

Earth Tech. June 2004, *Water Assets Study Town of West Boylston, Massachusetts Community Report*

Northeast Geoscience, Inc. *West Boylston Water District Emergency Plan 2010*.

Geologic Services Corporation. June 1989, *Hydrogeologic Study of the West Boylston Water District's Lee Street Gravel Packed Well #4*.

Town of West Boylston. *2009 Drinking Water Quality Report*. West Boylston Water District

Town of West Boylston. *Aquifer and Watershed Protection District Bylaw*. Town of West Boylston By-laws and Regulations.

Town of West Boylston Master Planning Committee. *West Boylston, Massachusetts Master Plan, 2005*. With assistance by Central Massachusetts Regional Planning Commission.

West Boylston Open Space Advisory Committee. *Open Space and Recreation Plan 2009 Update*.

## APPENDICES

### Appendix A: Aquifer/Watershed Protection District and Water Use Restriction Use Bylaw

#### *Aquifer and Watershed Protection District*

**Town of West Boylston** 127 Hartwell Street, Suite 100, West Boylston, MA 01583  
**ph:** (508) 835-6240  
**fx:** (508) 835-4102

#### **2.6 Aquifer and Watershed Protection District**

##### **A. Purpose of District**

The purpose of this Aquifer and Watershed Protection District is:

- 1.) To promote the health, safety, and general welfare of the community by ensuring the adequate quality and quantity of drinking water for the residents, institutions and businesses of the Town of West Boylston;
- 2.) To preserve and protect existing and potential sources of drinking water supplies;
- 3.) To conserve the natural resources of the town; and
- 4.) To prevent temporary and permanent contamination of the environment.

##### **B. Definitions**

- 1.) "Aquifer" means a geological formation which contains potable water and which yields or could yield a significant quantity of water
- 2.) "Discharge" means the pouring, dumping, spilling, leaking, pumping, depositing or injecting of any hazardous substance upon or into any land or water within the town.
- 3.) "District" means the zoning district defined to overlay the other zoning districts in the Town of West Boylston.

The Aquifer Protection District includes two recharge areas:

Zone II: The area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days at safe yield with no recharge from precipitation) as defined in 319 Code of the Commonwealth of Massachusetts Regulations (CMR) 22.00.

Zone III: The land area beyond the area of Zone II from which the surface water and groundwater drain into Zone II, as defined in 310 CMR 22.00

- 4.) "Groundwater" means all the water beneath the surface of the ground.
- 5.) "Hazardous Substance" means any material, the presence of which in drinking water, poses a significant, actual or potential risk of injury to the health of person, animals, or plants, including, without implied limitations, any material which constitutes "hazardous waste" for the purpose of M.G.L. Chapters 21C, 21E and 310 CMR 30.00. The Town Clerk shall maintain a list of the substances so designated under M.G.L. Chapters 21C, 21E and CMR 30.00.

- 6.) "Impervious" means impenetrable by water.
- 7.) "Map" means the Aquifer and Watershed Protection Overlay District identified below.
- 8.) "Mining" means the removal or relocation of geological materials including, without implied limitation, topsoil, sand, gravel, ores and rock.
- 9.) "Recharge Area" means:
- a.) A geological formation of permeable, porous material which allows the infiltration and/or collection of precipitation or surface water and the transmission of such water to an aquifer;
  - b.) Any wetland, stream, or body of water surrounded by, or adjacent to such an area; and
  - c.) The watershed of any such area, wetland, stream, or body of water.
- 10.) "Solid Waste" means useless, unwanted, or discharge materials with insufficient liquid content to be free flowing, including, without implied limitation, scrap, junk, garbage, rubbish, inert fill material and landscape refuse.
- 11.) "Septic Waste" means wastewater from normal domestic use containing normal kinds and concentrations of hazardous substances.
- 12.) "Town" means the Town of West Boylston.

### **C. Scope of Authority**

The Aquifer Protection District is an overlay district superimposed on the zoning districts. This overlay district shall apply to all new construction, reconstruction or expansion of existing buildings and new or expanded uses. Applicable activities or uses in a portion of one of the underlying zoning districts which fall within the Aquifer Protection District must additionally comply with the requirements of this district. Uses that are prohibited in the underlying zoning districts shall not be permitted in the Aquifer Protection District.

### **D. Establishment and Delineation of the Aquifer Protection District**

For the purpose of this district, here are hereby established within the town certain groundwater protection areas consisting of aquifers or recharge areas and delineated on map as "Aquifer Protection District". This map is at a scale of 1 inch to 800 feet and is entitled "Town of West Boylston Zoning Map", dated June 2, 1975 and revised December 1992. This map is hereby made a part of the Town by-laws and is on file in the office of the Town Clerk.

### **E. District Boundary Disputes**

If the location of the District boundary in relation to a particular parcel is in doubt, resolution of boundary disputes shall be through a Special Permit application to the Special Permit Granting Authority (SPGA). Any application for a Special Permit for this purpose shall be accompanied by an adequate documentation.

The burden of proof in such case concerning the proposed designation of the land at issue shall be upon the owner(s) of the land in question. The owner(s) may engage a geologist, hydrologist, soil scientist or a Massachusetts Professional Engineer experienced in groundwater evaluation or hydrology to determine more accurately the boundaries of the District with respect to the individual parcel(s) of land.

The SPGA may engage a professional geologist, hydrologist, soil scientist or a Massachusetts Professional Engineer experienced in groundwater evaluation or hydrogeology for the purpose of determining whether the land in question possesses the characteristics by which resource protection districts are delineated or whether land designated as lying within Zone II actually possesses the characteristics by which Zone II is delineated and may charge the owner(s) for the cost of making such determination.

The SPGA shall provide the owner(s) with a statement of work performed and the cost thereof when charging owner(s) hereunder.

## **F. Use Regulations**

Within the District both the regulations of this Section 2.6 and the regulations of the underlying district shall apply, except that in case of a conflict or inconsistency between such regulations, the more restrictive regulations shall apply.

### **1.) Permitted Uses**

The following uses are permitted within the Aquifer Protection District, provided all necessary permits, orders or approvals required by local, state or federal law are also obtained and remain in force for such use:

- a.) Conservation of soil, water, plants and wildlife;
- b.) Outdoor recreation not involving the use of motorized vehicles, nature study, boating, fishing and hunting;
- c.) Foot, bicycle and/or horse paths and bridges;
- d.) Normal operation and maintenance of existing water bodies and dams, splash boards and other water control supply and conservation devices;
- e.) Maintenance, repair, and enlargement of any existing structure, subject to Section 2 (Prohibited Uses) and Section 3 (Special Permit Uses);
- f.) Residential development, subject to Section 2 (Prohibited Uses) and Section 3 (Special Permit Uses);
- g.) Farming, gardening, nursery, conservation, forestry, harvesting and grazing subject to Section 2 (Prohibited Uses) and Section 3 (Special Permit Uses);
- h.) Construction, maintenance, repair and enlargement of drinking water supply related facilities such as, but not limited to, wells, pipelines, aqueducts and tunnels;
- i.) Operation and maintenance of roads and existing highways;
- j.) Individual sewage disposal systems that are designed in accordance with 310 CMR 15.00 or the Town of West Boylston's Board of Health Codes, whichever is more strict, provided that:
  - i.) The replacement or repair of a system, which will not result in an increase of design capacity over the original design, or design capacity of 310 CMR 15.00 whichever is greater, shall be exempted;
  - ii.) In the event cluster zoning subdivisions become allowed, the total sewage flow allowed shall be calculated based on the number of lots in the entire parcel.

### **2. Prohibited Uses**

- a.) Landfills and open dumps
- b.) Storage of liquid petroleum products except the following;
  - i.) Normal household use, outdoor maintenance and heating of a structure;
  - ii.) Waste oil retention facilities required by statute, rule or regulation;
  - iii.) Emergency generators required by statute, rule or regulation;
  - iv.) Treatment works approved under 314 CMR 5.99 for treatment of ground or surface water;

Provided that such storage listed in items 1 through 4 above is in free standing containers within building or above ground with secondary containment adequate to contain a spill the size of the container's total storage capacity.

- c.) Landfilling of sludge or septage as defined in 310 CMR 32.05;
- d.) Storage of sludge and septic unless such storage is in compliance with 310 CMR 32.30 and 310 CMR 32.31;
- e.) Storage of deicing chemicals unless such storage, including loading areas, is within a structure designed to prevent the generation and escape of contaminated runoff or leachate;
- f.) Storage of animal manure unless covered or contained in accordance with the specification of the United States Conservation Service;
- g.) Earth removal consisting of the removal of soil, loam, sand, gravel or any other earth material (including mining activities) to within 100 feet of historical high groundwater as determined from monitoring wells and historical water tables fluctuation data compiled by the United States Geological Survey except for excavations for building foundations, roads or utility works.
- h.) Facilities that generate, treat, store or dispose of hazardous waste subject to M.G.L. 21C and 310 CMR 30.00 except the following:
  - i.) Very small quantity generators as defined under 310 CMR 30.00;
  - ii.) Household hazardous waste centers and events under 310 CMR 30.390;
  - iii.) Waste oil retention facilities required by M.G.L. Chapter 21, Section 52A;
  - iv.) Water remediation treatment works approved by DEP for the treatment of contaminated ground or surface waters.
- i.) Automobile graveyards and junkyards;
- j.) Treatment works that are subject of 314 CMR 5.00 including privately owned sewage treatment facilities except the following:
  - i.) The replacement or repair of and existing treatment works that will not result in a design capacity greater than the design capacity of the existing system(s);
  - ii.) The replacement of existing sub-surface sewage disposal system(s) with wastewater treatment works that will not result in a design capacity greater than the



design capacity of the existing system(s);

iii.) Treatment works approved by the Massachusetts Department of Environmental Protection (DEP) designed for the treatment of contaminated groundwater;

iv.) Sewage treatment facilities in those areas with existing water quality problems when it has been demonstrated to the Department of Environmental Protection's and the Special Permit Granting Authority's satisfaction both that these problems are attributable to current septic problems and that there will be a net improvement in water quality.

k.) Storage of hazardous materials as defined in M.G.L. chapter 21E, unless in a free standing container within a building or above ground with adequate secondary containment adequate to contain a spill the size of the container's total storage capacity;

l.) Industrial and commercial uses which discharge process water on site;

m.) Stockpiling and disposal of snow and ice containing deicing chemicals if brought in from outside the district;

n.) Storage of commercial fertilizers as defined in M.G.L. Chapter 128, Section 64, unless such storage is within a structure designated to prevent the generation and escape of contaminated runoff and leachate;

o.) The use of septic system cleaners which contain toxic or hazardous chemicals;

p.) Any floor drainage systems as defined in 310 CMR 22.21 (2) (a) 8;

q.) All development in which more than 15 percent on the building lot (including one-half of the area portion of any new street which abuts the lot) is rendered impervious.

### 3. Uses and Activities Requiring a special Permit

The following uses and activities are permitted upon the issuance of a Special Permit by the Special Permit Granting Authority (SPGA) under such conditions as they may require:

a.) Enlargement or alteration of existing uses that do not conform to the Aquifer and Watershed Protection District;

b.) The Application of pesticides, including herbicides, insecticides, fungicides and rodenticides for non-domestic or non-agricultural uses in accordance with state and federal standards. The Special Permit shall be granted if such standards are met. If applicable, the applicant should provide documentation of compliance with a Yearly Operating Plan (YOP) for vegetation management operations under 333 CMR 11.00 or a Department of Food and Agriculture approved Pesticide Management Plan (PMP) or Integrated Pest Management (IPM) program under 333 CMR 12.00;

c.) The application of fertilizers for non-domestic or non-agricultural uses. Such application shall be made in a manner so as to minimize adverse impacts on groundwater due to nutrient transport, deposition and sedimentation;

d.) Those activities that involve the handling of toxic or hazardous materials in quantities greater than those associated with normal household use are permitted in the underlying Zone (except as prohibited under Section 2). Such activities shall require a Special Permit to prevent contamination of groundwater;

e.) The construction of dams or other water control devices, ponds, pools or other changes in water bodies or courses created for swimming, fishing or other

recreational uses, agricultural uses or drainage improvements. Such activities shall not adversely affect water quality or quantity.

#### **G. Procedures for issuance of Special Permit**

1.) The Special Permit Granting Authority (SPGA) under this by-law shall be the Planning Board. Such Special Permit shall be granted if the SPGA determines that the intent of this by-law as well as its specific criteria are met.

The SPGA shall not grant a Special Permit under this section unless the petitioner's application materials include, in the SPGA's opinion, sufficiently detailed information to support positive findings in relation to the standards delineated in Section 2.6 E and given in this section.

2.) Upon receipt of the Special Permit application under this Section 2.6, the SPGA shall, in addition to complying with Section 2.6, transmit one copy to the Water District, the Inspector of Buildings, the Board of Health, the Conservation Commission, and the Town Engineer/Department of Public Works for their written recommendations.

Failure to respond in writing within 35 days of receipt by the Board shall indicate approval or no desire to comment by said agency. The necessary number of copies shall be furnished by the applicant.

3.) The SPGA may grant the required Special Permit only upon finding that the proposed use meets the following standards in Section 2.6 of this by-law and shall:

a.) Not during construction or thereafter, adversely affect the existing or potential quality or quantity of water that is available in the Aquifer Protection District; and

b.) Be designed to avoid substantial disturbance of the soils, topography, drainage, vegetation and other water-related natural characteristics of the site to be developed.

4.) The SPGA may adopt regulations to implement this by-law to govern design features of projects. Such regulations shall be consistent with subdivision regulations adopted by the Town.

5.) The applicant shall file required number of 6 copies of a site plan and attachments. The site plan shall be drawn at a proper scale as determined by the SPGA and be stamped by a Massachusetts Professional Engineer. All additional submittals must be prepared by qualified professionals. The site plan and its attachments shall, at a minimum, include the following information where pertinent:

a.) A complete list of chemicals, pesticides, herbicides, fertilizers, fuels and other potentially hazardous materials to be used or stored on the premises in quantities greater than those associated with normal household use;

b.) For those activities using or storing such hazardous materials, a hazardous materials management plan shall be prepared and filed with the Hazardous Materials Coordinator, Fire Chief and Board of Health.

c.) Proposed down-gradient location(s) for the groundwater monitoring well(s) should the SPGA deem the activity a potential aquifer threat.

The Plan shall include:

i.) Provisions to protect against discharge of hazardous materials or wastes to the environment due to spillage, accidental damage, corrosion, leakage or vandalism including spill containment and cleanup procedures;

ii.) Procedures for indoor secured storage of hazardous materials and wastes with impervious floor surfaces;

iii.) Evidence of compliance with the Regulation of the Massachusetts Hazardous Waste Management Act 310 CMR 30, including obtaining an EPA identification number from the Massachusetts Department of environmental Protection.

6.) The SPGA shall hold a hearing in conformity with the provision of M.G.L. chapter 40A, Section 9 within 65 days after the filing of the application and after the review by the Town boards, departments, commissions and the Water District.

Notice of the public hearing shall be given by publication and posting and by first-class mailing to "parties of interest" as defined in Chapter 40A, Section 11.

The SPGA shall obtain with each submission a filing fee (to be established by the SPGA) and a deposit sufficient to cover any expenses connected with the public hearing and review of the Special Permit application. Review fees shall be paid by the applicant before the Special Permit application review process shall begin. Any portion of the fee not used shall be returned to the applicant.

The decision of the SPGA and any extensive, modification or renewal thereof shall be filed with the SPGA and the Town Clerk within 90 days following the close of the Public Hearing. Failure of the SPGA to act within 90 days shall be deemed as a granting of the permit. However, no work shall commence until a certification is recorded as required by said Section 11.

7.) Written notice of any violations of this Section 2.6 shall be given by the Zoning Officer (Inspector of Buildings) to the responsible person as soon as possible after the detection of a violation or a continuing violation.

Notice to the assessed owner of the property shall be deemed notice to the responsible person. Such notice shall specify the requirement or restriction violated and the nature of the violation and may also identify the actions necessary to remove or remedy the violations and preventative measures required for avoiding future violations and a schedule of compliance.

A copy of such notice shall be submitted to the Planning board, the Board of Health, conservation commission, Town Engineer/Department of Public Works and Water District. The cost of containment, clean-up or other action of compliance shall be borne by the owner and operator of the premises. For situations that require remedial action to prevent adverse impact to the water resources within the Aquifer Protection District, the Town of West Boylston, the Inspector of Buildings, the Board of Health, or any of their agents may order the owner or operator of the premises to remedy the violation. If said owner and/or operator does not comply with said order, the Town of West Boylston, the Inspector of Buildings, the Board of health or any of their agents, if authorized to enter upon such premises under the terms of the Special Permit or otherwise, may act to remedy the violation. The remediation cost shall be the responsibility of the owner and/or operator of the premises.

#### **H. Severability**

A determination that any portion or provision of this Aquifer Protection District is invalid shall not invalidate any other portion or provision thereof, nor shall it invalidate any Special Permit previously issued hereunder.

*Amended*

*June 23, 1986 - Article 2*

*May 16, 1994 - Article 2*



## ***West Boylston Water Use Restriction Bylaw***

### **Section 6-1. Authority**

This bylaw is adopted by the West Boylston Water District under its police powers to protect public health and welfare and its powers under chapter 352 p the Acts of 1933 as amended and M.G.L. c. 40, SS21 et seq. This bylaw also implements the Water District's authority under M.G.L. c. 40. S41A, conditioned upon a declaration of water supply emergency issued by the Department of Environmental Protection.

### **Section 6- 2. Purpose**

The purpose of this bylaw is to protect, preserve and maintain the public health, safety and welfare whenever there is in force a State of Water Supply Conservation of State Water Supply Emergency as defined herein by providing for enforcement of any duly imposed restrictions, requirements, provisions or conditions imposed by the West Boylston Water District or by the Department of Environmental Protection.

### **Section 6-3. Definitions**

For purposes of this bylaw, the following words and phrases shall have the meaning set forth herein:

Outdoor watering shall mean any residential, municipal, industrial, or commercial watering of decorative lawns, trees and shrubbery.

Person shall mean any individual, corporation, trust, partnership or association, or other entity and any officer, employee group or agent of such person.

State of Water Supply Emergency shall mean a State of Water Supply Emergency declared by the Department of Environmental Protection under M.G.L. c. 21G, S15-17.

State of Water Supply Conservation shall mean a State of Water Supply Conservation declared by the Board of Commissioners of the West Boylston Water District, pursuant to section 4 of this bylaw.

Water Users or Water Consumers shall mean all public and private users of the West Boylston Water District water system, irrespective of any person's responsibility for billing purposes for water used at any particular facility.

### **Section 6. 4. Declaration of a State of Water Supply Conservation**

The Water District, through its Board of Water Commissioners, may declare a State of Water Supply Conservation upon a determination by a majority vote of the Board that a shortage of water exists of such a degree that conservation measures are appropriate to ensure an adequate supply of water to all water consumers. Public notice of a State of Water Conservation shall be given under section 6 of this bylaw before it may be enforced.

### **Section 6. 5. Restricted Water Uses**

A declaration of a State of Water Supply Conservation shall include one or more of the following restrictions, conditions or requirements limiting the use of water as necessary



to protect the water supply. The applicable restrictions, conditions or requirements shall be included in the public notice required under section 6.

- a) Odd/Even Day Outdoor Water Usage: Outdoor watering by water users with odd numbered addresses is restricted to odd numbered days. Outdoor watering by water users with even numbered addresses is restricted to even numbered days.
- b) Outdoor Watering Ban: Outdoor watering is prohibited
- c) Outdoor Water Usage Hours: Outdoor watering is permitted only during periods of low demand, to be specified in the declaration of a State of Water Supply Conservation and public notice thereof.
- d) Filling Swimming Pools: Filling swimming pools is prohibited.
- e) Automatic Sprinkler Use: The use of automatic sprinkler systems is prohibited.
- f) Any other restriction on water usage the District finds necessary.

#### **Section 6-6. Public Notification of Water Supply Conservation: Notification of DEP**

Notification of any provision, restriction, requirement or condition imposed by the West Boylston Water District as part of a State of Water Supply Conservation shall be published in a newspaper of general circulation within the West Boylston Water District or by such other means reasonably calculated to reach and inform all users of water of the State of Water Supply Conservation. Any restrictions imposed under section 5 shall not be effective until such notification is provided. Notification of the State of Water Supply conservation shall also be simultaneously provided to the Massachusetts Department of Environmental Protection.

#### **Section 6-7. Termination of a State of Water Supply Conservation: Notice**

A State of Water Supply Conservation may be terminated by a majority vote of the Board of Water Commissioners, upon a determination that the water supply shortage no longer exists. Public notification of the termination of a State of Water Supply Conservation shall be given in the same manner required by section 6.

#### **Section 6- 8. State of Water Supply Emergency; Compliance with DEP Orders.**

Upon notification to the public that a declaration of a State of Water Supply Emergency has been issued by the Massachusetts Department of Environmental Protection, no person shall violate any provision, restriction, requirement, or condition of any order approved or issued by the Department intended to bring about an end to the State of Emergency.

#### **Section 6-9. Penalties**

The West Boylston Water District Superintendent may enforce this bylaw. Any person violating this by-law (ordinance) shall be liable to the Water District in the amount of \$50.00 for the first violation and \$100.00 for each subsequent violation. Fines shall be recovered by indictment, or on complaint before the District Court, or by non-criminal disposition in accordance with section 21D of chapter 40 of the general laws or any other authority of the District.

### **Section 6-10. Severability**

The invalidity of any portion or provision of this bylaw shall not invalidate any other portion or provision thereof.

### ***West Boylston Drought Management Plan***

Adopted November 19, 2002

Being prepared for water shortages caused by drought or extreme circumstances is an important component of West Boylston's Water Resources Management Program. This plan sets what levels of dry or drought conditions indicate a water supply shortage or emergency and establishes the prudent response for each level. The Drought Management Plan may be implemented for municipally supplied water to conserve a naturally stressed water supply during a drought or to replenish water supplies diminished by peak demand in non-drought years.

### ***WATER USE RESTRICTIONS***

These restrictions allow the Board of Commissioners to limit consumption through increasingly severe restrictions based on indicators that correspond to the specific drought stages for West Boylston's water supply.

#### ***OUTDOOR WATER USE RESTRICTIONS***

**Even number houses may use water outdoors on even numbered days.**

**Odd number houses may use water outdoors on odd numbered days.**

**No outdoor water use on Mondays to allow system to replenish.**

**No lawn watering between 7am – 7pm.**

### ***GRADUATED DROUGHT RESTRICTION MEASURES***

Graduated water use restrictions will be implemented to correspond with the severity of the drought stage to assure a sufficient and predictable response to excessive water use and drought conditions.

#### ***Restrictions for DROUGHT ADVISORY***

Voluntary conservation, on an alternate day schedule, for outdoor water use for irrigation of lawns and gardens, car washing and sprinklers. No swimming pool filling from municipal water supply.

#### ***Restrictions for DROUGHT WATCH\****

Mandatory water conservation, on an alternate day schedule, for outdoor water use for irrigation of lawns and gardens, car washing and sprinklers. Use of sprinklers is limited to two (2) hours per each scheduled watering day. No swimming pool filling from municipal water supply.

#### ***Restriction for DROUGHT WARNING\****

Mandatory water conservation, on an alternate day schedule for outdoor water use. No watering of lawn and no outdoor sprinklers allowed. Manual watering of gardens and trees with hose or watering can allowed. Car washing allowed.

#### ***Restrictions for DROUGHT EMERGENCY\****

Mandatory ban on all outdoor water use: Sprinklers, car washing, swimming pool filling and lawn and garden irrigation.

\*Residents may request a two-week watering permit from the District for new lawns.

\*Residents may request a one-day watering permit from the District for specific activities (pressure washing.)

\*Residents may request permission from the District to top off their swimming pools.

## Appendix B: Planning and Implementing a Local Floor Drain Control

# Planning and Implementing a Local Floor Drain Control

The following tips are designed to assist local officials with planning and implementing a floor drain control (regulation or bylaw) as required by 310 CMR 22.21(a)(8). Related documents include DEP's Hazardous Materials Management Guide and Model Board of Health Floor Drain Regulation, which are available from the Drinking Water Program at 617-348-4014, or by visiting [mass.gov/dep/brp/dws/protect.htm](http://mass.gov/dep/brp/dws/protect.htm).

### Planning

1. Identify the location of your town's drinking water supply protection areas. A copy of the Zone II(s) can be obtained from your Town's public water supplier or by contacting DEP.
2. Target the scope of your regulation:
  - (a) **Which facilities in town will be affected?** Industrial, commercial and municipal facilities that store or process hazardous material or hazardous waste and do not have a DEP groundwater discharge permit or connect to the local sewer district.
  - (b) **What area(s) in town should the regulation cover?** The floor drain requirement, under 310 CMR 22.21(2)(a)(8), must cover the DEP approved Zone II recharge areas. However, DEP recommends that communities adopt a town-wide control whenever possible.
  - (c) **How do I locate facilities with floor drains?** If there are numerous facilities in your community, it may take some time to locate all of them. Begin by focusing on locating establishments within the Zone II(s). Most Boards of Health and fire departments require businesses to provide a list of hazardous materials stored or waste generated on-site. Other resources for locating facilities include the local zoning map (which identifies commercial and industrial areas), the tax assessor's maps (which provide addresses), the building/plumbing inspectors (who often know business locations) and DEP's Source Water Assessment and Protection (SWAP) reports.
3. Coordinate the local inspection program with the town's water supplier, fire chief, building inspector, plumbing inspector and local publicly owned treatment works.
4. Identify the local official or agent responsible for implementing and enforcement; this could be an official such as the health agent, building inspector, or plumbing inspector.
5. Consider adopting a hazardous materials bylaw or health regulation. They complement floor drain controls and provide the town with a comprehensive approach for addressing hazardous materials and discharges at existing and proposed facilities.

## Implementation

1. Prioritize inspections. If the floor drain control applies to the entire town, focus on the Zone II areas first and phase in the other areas over time.
2. Inspections should serve as the primary vehicle to implement the regulation. When conducting inspections:
  - (a) Provide each facility owner or operator with a map indicating the location of their facility with respect to the drinking water well and Zone II area(s).
  - (b) Determine if floor drains are present in the hazardous material or hazardous waste process area or storage area of the facility. If so, determine the ultimate discharge point of the drain:

Sewer connection: Verify the discharge of a drain to the municipal sanitary sewer line by either seeing “as-built” diagrams or town or state sewer connection records, or through the use of field efforts such as a dye test.

Holding Tanks: Verify the connection of a drain to a holding tank by seeing DEP holding tank permit records. Oil/water separators are designed to have a discharge. Unless specifically converted with DEP approval, they are not holding tanks.

If an oil/water separator is in use (they must be used by some facilities such as auto repair garages with drains tied to the sanitary sewer line), determine the current maintenance pumping schedule for it.
3. Assist facilities in complying with the regulation and provide them with information on how to best manage hazardous materials. Best Management Guidance material is available from
4. If a facility claims to have a valid Ground Water Discharge Permit, verify this by contacting the DEP regional office:

WERO (413) 784-1100	CERO (508) 792-7650
NERO (978) 661-7600	SERO (508) 946-2700
5. Facilities should obtain appropriate permit applications from DEP.

NOTE: The permit program is currently in forbearance and will be replaced by a Certificate program; the facility should contact the DEP Regional office and ask for the Industrial Wastewater group for direction. Prior permits included:

  - (a) New Holding Tank Permit
  - (b) Conversion of Separator to Holding Tank Permit
  - (c) Sewer Connection Permit

For more information on floor drains, contact the  
DEP Underground Injection Control Program at (617) 348-4014  
or <http://mass.gov/dep/brp/dws/uic.htm>



**MODEL FLOOR DRAIN REGULATION**  
**[TOWN/CITY] BOARD OF HEALTH** date of issuance

**NOTES:**

- In 1992 MassDEP amended their Source Approval requirements to include a prohibition on floor drains that discharge to the ground in Zone II recharge areas.
- This model regulation meets the requirements of the Wellhead Protection Regulation, 310 CMR 22.2 1(2)(a)8.
- MassDEP recommends communities use this Model as the basis for their local floor drain control.
- MassDEP recommends all communities adopt and implement a floor drain control to protect drinking water resources.
- This model is broader in scope than 310 CMR 22.2 1(2)(a)8 and applies to the entire municipality. Portions of this model, shown within {brackets} are more stringent than 310 CMR 22.2 1(2)(a)8 and are therefore optional.
- When adopting this model:
  - delete these Notes
  - delete the word 'Model'
  - choose the correct term/word
  - fill in blanks
  - remove {brackets}

**Section I. PURPOSE OF REGULATION**

Whereas:

- floor drains in industrial and commercial facilities are often tied to a system leading to a leaching structure or a septic system; and
- poor management practices and accidental and/or intentional discharges may lead petroleum and
- other toxic or hazardous materials into these drainage systems in facilities managing these products; and
- improper maintenance or inappropriate use of these systems may allow the passage of contaminants or pollutants entering the drain to discharge from the leaching structure or septic system to the ground; and
- discharges of hazardous wastes and other pollutants to floor drains leading to leaching structures and septic systems have repeatedly threatened surface and ground water quality throughout Massachusetts; and
- surface and ground water resources in the Town/City of contribute to drinking water supplies.

The Town/City of adopts the following regulation, under its authority as specified in Section II, as a preventative measure for the purposes of preserving and protecting the Town/City of drinking water

resources from discharges of pollutants to the ground via floor drains, and minimizing the threat of economic losses due to such discharges.

## **Section II. SCOPE OF AUTHORITY**

The Board of Health adopts the following regulation pursuant to authorization granted by M.G.L. c. 111 s.31 and s. 122. The regulation shall apply, as specified herein, to all applicable facilities, **existing and new**, within the Town/City of .

## **Section III. DEFINITIONS**

For the purposes of this regulation, the following words and phrases shall have the following meanings:

Commercial and Industrial Facility: A public or private establishment where the principal use is the supply, sale, and/or manufacture of services, products, or information, including but not limited to: manufacturing, processing, or other industrial operations; service or retail establishments; printing or publishing establishments; research and development facilities; small or large quantity generators of hazardous waste; laboratories; hospitals.

Department: The Massachusetts Department of Environmental Protection.

Discharge: The accidental or intentional disposal, deposit, injection, dumping, spilling, leaking, incineration, or placing of toxic or hazardous material or waste upon or into any land or water so that such hazardous waste or any constituent thereof may enter the land or waters of the Commonwealth. Discharge includes, without limitation, leakage of such materials from failed or discarded containers or storage systems and disposal of such materials into any on-site leaching structure or sewage disposal system.

Floor Drain: An intended drainage point on a floor constructed to be otherwise impervious which serves as the point of entry into any subsurface drainage, treatment, disposal, containment, or other plumbing system.

Leaching Structure: Any subsurface structure through which a fluid that is introduced will pass and enter the environment, including, but not limited to, dry wells, leaching catch basins, cesspools, leach fields, and oil/water separators that are not water-tight.

Oil/Water Separator: A device designed and installed so as to separate and retain petroleum based oil or grease, flammable wastes as well as sand and particles from normal wastes while permitting normal sewage or liquid wastes to discharge into the drainage system by gravity. Other common names for such systems include MDC traps, gasoline and sand traps, grit and oil separators, grease traps, and interceptors.

Toxic or Hazardous Material: Any substance or mixture of physical, chemical, or infectious characteristics posing a significant, actual, or potential hazard to water supplies or other hazards to human health if such substance or mixture were discharged to land or waters within the Town/City of Name. Toxic or hazardous materials include, without limitation, synthetic organic chemicals, petroleum products, heavy metals, radioactive or infectious wastes, acids and alkalis, and all substances defined as Toxic or Hazardous under Massachusetts General Laws (MGL) Chapter 2 1C and 2 1E or Massachusetts Hazardous Waste regulations (310 CMR 30.000), and also include such products as solvents, thinners, and pesticides in quantities greater than normal household use.

Use of Toxic or Hazardous Material: The handling, generation, treatment, storage, or management of toxic or hazardous materials.

#### **Section IV. PROHIBITIONS**

With the exception of discharges that have received (or have applied and will receive) a Department issued permit prior to the effective date of this regulation, no floor drain(s) shall be allowed to discharge, with or without pretreatment (such as an oil/water separator), to the ground, a leaching structure, or septic system in any industrial or commercial facility if such floor drain is located in either:

- A. an industrial or commercial process area,
- B. a petroleum, toxic, or hazardous materials and/or waste storage area, or
- {C. a leased facility without either A or B of this section, but in which t he potential for a change of use of the property to a use which does have either A or B is, in the opinion of the Board of Health or its agent, sufficient to warrant the elimination of the ground discharge at the present. }

#### **Section V. REQUIREMENTS FOR EXISTING FACILITIES**

A. The owner of a facility in operation prior to the effective date of this regulation with a prohibited (as defined under Section IV) floor drain system shall:

1. Where possible, disconnect and plug all applicable inlets to and outlets from applicable leaching structures, oil/water separators, and/or septic systems;
2. Remove all existing sludge in oil/water separators, septic systems, and where accessible, leaching structures. Any sludge determined to be a hazardous waste shall be disposed of in accordance with state hazardous waste regulations, 310 CMR 30.000. Remedial activity involving any excavation and/or soil or groundwater sampling must be performed in accordance with appropriate Department policies;
3. Alter the floor drain system so that the floor drain shall be either:
  - (a). connected to a holding tank that meets all applicable requirements of Department policies and regulations, with hauling records submitted to the Board of Health at the time of hauling;
  - (b). connected to a municipal sanitary sewer line, if available, with all

- applicable Department and local permits; or
- (c). permanently sealed. { Any facility sealing a drain shall be required to submit for approval to the Board of Health a hazardous waste management plan detailing the means of collecting, storing, and disposing any hazardous waste generated by the facility, including any spill or other discharge of hazardous materials or wastes. }

B. Any oil/water separator remaining in use shall be monitored weekly, cleaned not less than every 90 days, and restored to proper conditions after cleaning so as to ensure proper functioning. Records of the hauling of the removed contents of the separator shall be submitted to the Board of Health at the time of hauling.

C. Compliance with all provisions of this regulation must be accomplished in a manner consistent with Massachusetts Plumbing, Building, and Fire code requirements.

D. Upon complying with one of the options listed under Section V.A.3., the owner/operator of the facility shall notify the Department of the closure by filing the Department's UIC Pre-Closure Form BRP WS-06d (which may be obtained by calling 617/292-5770) with the Department, and sending a copy to the Board of Health.

## **Section VI. EFFECTIVE DATES FOR ALL FACILITIES**

The effective date of this regulation is the date posted on the front page of the regulation, which shall be identical to the date of adoption of the regulation.

### **A. Existing Facilities:**

1. Owners/Operators of a facility affected by this regulation shall comply with all of its provisions within {120} days of the effective date;
2. All applicable discharges to the leaching structures and septic systems shall be discontinued immediately through temporary isolation or sealing of the floor drain.

### **B. New Facilities:**

1. As of the effective date of the regulation, all new construction and/or applicable change of use within the Town/City of \_\_\_\_\_ shall comply with the provisions of this regulation.
2. Certification of conformance with the provisions of this regulation by the Board of Health shall be required prior to issuance of construction and occupancy permits.

3. The use of any new oil/water separator shall comply with the same requirements as for existing systems, as specified above in Section V.B. }

## **Section VII. PENALTIES**

Failure to comply with provisions of this regulation will result in the levy of fines of not less than \$ {200.00}, but no more than \$1000.00. Each day's failure to comply with the provisions of this regulation shall constitute a separate violation.

## **Section VIII. SEVERABILITY**

Each provision of this regulation shall be construed as separate to the end that, if any provision, or sentence, clause or phrase thereof, shall be held invalid for any reason, the remainder of that section and all other sections shall continue in full force and effect.<sup>1</sup>

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<sup>1</sup> Model updated 2009/DEP/DWP



## Appendix C: MassDEP UST list for West Boylston

For more information please visit the MassDEP UST query tool website at:  
<http://db.state.ma.us/dep/ust/ustQueryPage.asp>

<b>Facility:</b> OAKDALE REHAB & SKLD NURSING CTR	<b>DFS Facility ID#:</b> 22611	<b>Owner:</b> WEST BOYLSTON NURSING HOME INC
<b>Address:</b> 76 N MAIN ST WEST BOYLSTON, MA, 01583 <b>County:</b> Worcester	<b>Phone:</b> (508) 835-6076  <b>Description:</b> Residential	<b>Address:</b> 76 N MAIN ST WEST BOYLSTON, MA, 01583
<b>Operator:</b> DAVID ORIOL	<b>Inspection Information</b>	
<b>Address:</b> 76 N MAIN ST WEST BOYLSTON, MA, 01583	<b>Info Updated Date:</b> 12/19/2007 <b>Last Third Party Date:</b> <b>COC Expires:</b>	<b>Overfill Prevention:</b> Yes <b>Spill Prevention:</b> Yes
There Is No <b>Tank Information</b> for this facility...		

<b>Facility:</b> R E CHAPMAN COMPANY	<b>DFS Facility ID#:</b> 18008	<b>Owner:</b> R E CHAPMAN COMPANY
<b>Address:</b> 30 N MAIN ST WEST BOYLSTON, MA, 01583 <b>County:</b> HAMPDEN	<b>Phone:</b> (617) 835-6231  <b>Description:</b> Other	<b>Address:</b> 30 N MAIN ST WEST BOYLSTON, MA, 01583
<b>Operator:</b> ROBERT E. CHAPMAN JR.	<b>Inspection Information</b>	
<b>Address:</b>  , MA,	<b>Info Updated Date:</b> <b>Last Third Party Date:</b> <b>COC Expires:</b>	<b>Overfill Prevention:</b> No <b>Spill Prevention:</b> No

FP290 - Tank Info:													
ID	Installation Date	Capacity	Contents	Status	Status Date	Use	Tank Material	Tank Type	Pipe Material	Pipe Type	Tank Leak Detection	Pipe Leak Detection	
1	4/14/1984	550	Waste Oil	In Use			Reinforced						

## Resources



Massachusetts Department of Environmental Protection  
Source Water Assessment and Protection (SWAP) Report  
for  
**West Boylston Water District**

### 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**

<i>PWS Name</i>	West Boylston Water District
<i>PWS Address</i>	183 Worcester Street
<i>City/Town</i>	West Boylston
<i>PWS ID Number</i>	2321000
<i>Local Contact</i>	Board of Water Commissioners
<i>Phone Number</i>	(508) 835-3025

### Introduction

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

#### Purpose of this report:

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

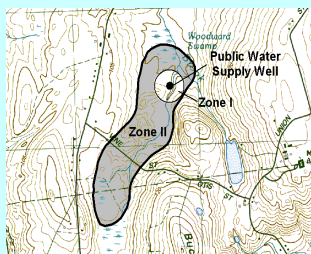
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

#### This report includes the following sections:

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

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



### Glossary

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material (i.e. clay) that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

**Zone II:** The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

## Section 1: Description of the Water System

### *Zone II #: 493*

*Susceptibility: High*

<i>Well Names</i>	<i>Source IDs</i>
Well #1	2321000-01G

### *Zone II #: 82*

*Susceptibility: Moderate*

<i>Well Names</i>	<i>Source IDs</i>
Well #4	2321000-04G

### *Zone II #: 433*

*Susceptibility: High*

<i>Well Names</i>	<i>Source IDs</i>
Well #5	2321000-05G

The three (3) wells for West Boylston Water District are located in three separate Zone IIs. The Zone II for Well #1 stretches into the Town of Sterling; the Zone II for Well #4 stretches into the Town of Holden; and the Zone II for Well #5 stretches into the Town of Boylston. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Well #1 and #5 treat the water with potassium hydroxide for corrosion control, and sodium based phosphate sequestration for iron and manganese. 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 are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

## Section 2: Land Uses in the Protection Areas

The Zone IIs for the West Boylston Water District are a mixture of residential, commercial, and 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. Inappropriate activities in Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is High for Well #5, and Well #1, and Moderate for Well #4, based on the presence of at least one high threat land use within the water supply protection area of Well #5, and only moderate and low threat uses in the protection areas of Wells #1 and #4, as seen in Table 2.

**1. Inappropriate Activities in Zone Is** – The Zone I for each of the wells has a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. One Zone I (Well #1) is not owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

**Zone I:** All three wells have highways and local roads running through the Zone I, and Well #1 has recreational activities occurring within the Zone I.

**Zone I Recommendations:**

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
- ✓ Keep any new non water supply activities out of the Zone Is.

**2. Residential Land Uses** – Approximately 80 % of the Zone II consists of forested land, and approximately 10 % is residential. None of the areas have public sewers, and so all use 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 groundwater because septic systems lead to the groundwater. 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.

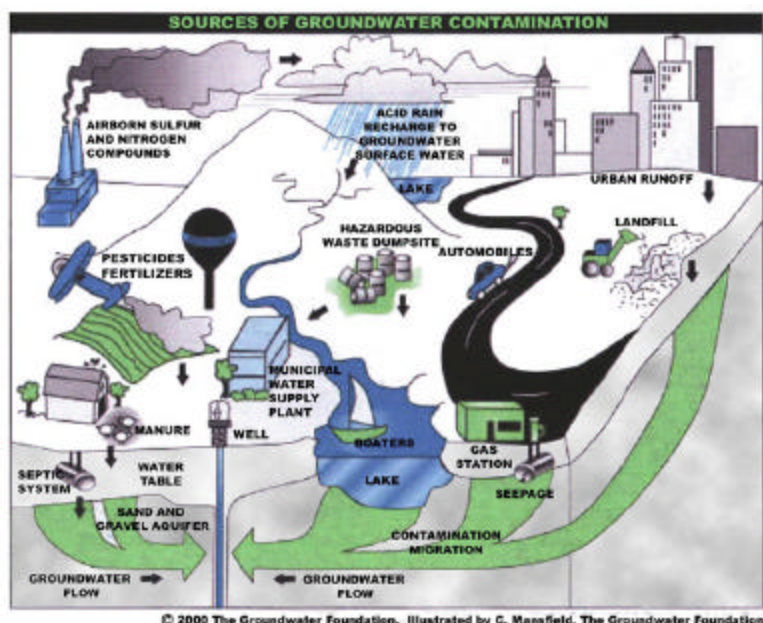
- **Heating Oil Storage (Residential)** - If managed improperly, Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater**—Catch basins transport stormwater from roadways and adjacent properties to the ground. 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,

## 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.



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](http://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.

**3. Transportation Corridors** - Route I-90, Route 140 and Route 12 run through the Zone IIs. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

#### **Transportation Corridor Recommendations:**

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Towns and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

#### **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 Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 849-4030 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.

#### **4. Hazardous Materials Storage and Use –**

Approximately one percent (1%) of the land area within the Zone II is industrial land uses. Many industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

#### **Hazardous Materials Storage and Use Recommendations:**

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on [www.mass.gov/dep/brp/dws/protect.htm](http://www.mass.gov/dep/brp/dws/protect.htm), which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of

(Continued on page 6)

#### **Source Protection Decreases Risk**

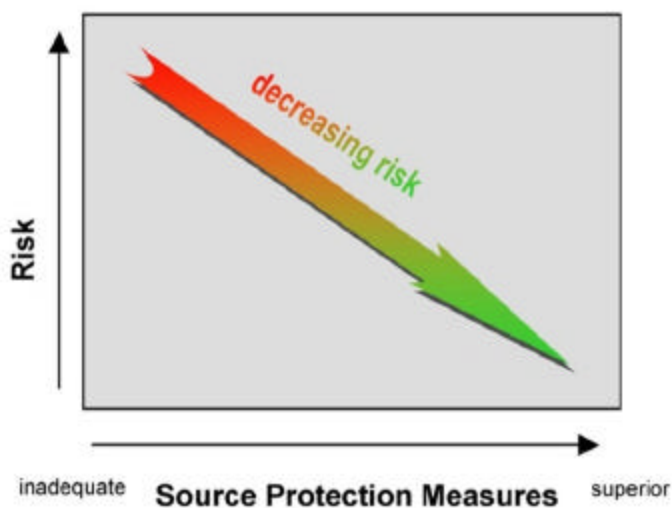


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.



### 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 (Zones I and II)**

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

Activities	Quantity	Threat*	Potential Source of Contamination
<b>Commercial</b>			
Cemeteries	Two	L	Over-application of pesticides: leak, spills, improper handling; historic embalming fluids
Nursing Homes	One	L	Microbial contaminants: improper management
Railroad Tracks	One	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or
<b>Residential</b>			
Fuel Oil Storage (at residences)	Several	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Several	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Several	M	Hazardous chemicals: microbial contaminants, and improper disposal
<b>Miscellaneous</b>			
Aquatic Wildlife	Several	L	Microbial contaminants
Small quantity hazardous waste generators	One	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Several	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Two	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

See Table notes on page 6.

**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.

hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**5. Protection Planning** – Currently, the Town does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead 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 supply wells.

**Protection Planning Recommendations:**

- ✓ Develop a Wellhead 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 Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ Work with neighboring communities to ensure that areas of your Zone II within those towns are protected by their local protection measures to meet 310 CMR 22.21(2).

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

## 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.

### Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to 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.
- ✓ 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 Wellhead Protection Plan.

### 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

### What is a Zone III?

A Zone III is the land beyond the Zone II from which surface and ground water may drain to the Zone II.

The Zone III includes the Zone II and the additional recharge area that could contribute water to the Zone II.

Land uses within the Zone III that are located outside of the Zone II were not assessed for this report.

This area was not assessed due to either or both of the following:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of contaminant transport through the groundwater.
2. An assessment has been made that groundwater in this area probably discharges to surface water features rather than traveling directly toward the well.

### Additional Documents:

To help with source protection efforts, more information is available by request or online at [mass.gov/dep/brp/dws](http://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

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>.

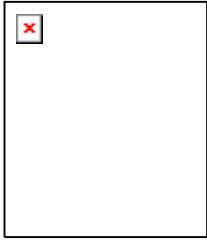
The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion 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 Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

## Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area

**Table 3: Current Protection and Recommendations**

Protection Measures	Status	Recommendations
<b>Zone I</b>		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	<b>NO</b>	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.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	<b>NO</b>	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	<b>YES</b>	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	<b>YES</b>	Continue monitoring non-water supply activities in Zone Is.
<b>Municipal Controls</b> (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	<b>NO</b>	The Town does not have an "Aquifer Protection District" bylaw that meets DEP's requirements. Refer to <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	<b>NO</b>	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
<b>Planning</b>		
Does the PWS have a Wellhead Protection Plan?	<b>NO</b>	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: <a href="http://www.state.ma.us/dep/brp/dws/">www.state.ma.us/dep/brp/dws/</a> .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	<b>NO</b>	Develop a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	<b>NO</b>	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	<b>NO</b>	For more guidance see "Hazardous Materials Management: A Community's Guide" at <a href="http://www.state.ma.us/dep/brp/dws/files/hazmat.doc">www.state.ma.us/dep/brp/dws/files/hazmat.doc</a>
Does the PWS provide wellhead protection education?	<b>NO</b>	Aim efforts at commercial, industrial and municipal uses within the Zone II.



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI  
Governor

JANE SWIFT  
Lieutenant Governor

BOB DURAND  
Secretary

LAUREN A. LISS  
Commissioner

**Determining a Threat To Public Water Supplies Related to Presence of Beaver and Muskrat  
Standard Operating Procedure (SOP)  
Drinking Water Program**

Applies to Public Water Suppliers (PWSs) with beaver or muskrat populations endangering public water supply sources or pump stations:

*Rationale:* The presence of beavers or muskrats near public water supply sources may pose a threat to the protection of public health. Both animals have commonly been identified as carriers of *Giardia Lamblia* and *Cryptosporidium*--pathogens identified within the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule respectively as posing an unacceptable risk to drinking water. Amendments to the State's trapping laws charge DEP with determining when a threat to human health and safety exists as a result of the presence of beavers and muskrats in and around public water supply sources and pump stations. A DEP determination that a threat exists may be used by an applicant to petition the local Board of Health for an emergency permit to eliminate the threat.

*Applications*

Applications to DEP requesting that a determination as to the existence of a threat to human health and safety resulting from beavers and muskrats in and around public water supply sources and pump stations must include the following information:

1. A scaled site map showing the location of all affected areas where determinations are requested in relation to all potentially impacted public water supply sources or pump stations. All public water supply sources and pump stations must be labeled on the site plan.
2. A narrative which:
  - a. Details the reason for the determination request;
  - b. Identifies the duration of the problem;
  - c. Identifies control mechanisms already used;
  - d. Identifies changes in water levels or flowpath. This information will be specific to problems related to flooding; and
  - e. Includes available evidence of interaction between groundwater sources and surface waters.
3. A description of the proposed method for eliminating the threat which:

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

DEP on the World Wide Web: <http://www.state.ma.us/dep>



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- a. Specifies the type of trap, if any, that will be used;
- b. Specifies if dams will be breached; and
- c. Specifies if the use of non-lethal management or water-flow devices is proposed.

### Review and Determination

DEP may determine that a threat to human health and safety exists if beavers or muskrats or dams or active lodges are observed:

- Within a pathogen control zone previously sanctioned by the Massachusetts Division of Fisheries and Wildlife.
- Within a terminal reservoir or in a tributary within 400 feet of a terminal reservoir.
- Within 400 feet of a public water supply well or wellfield.
- Within 200 feet of a public water supply pump station.
- In a tributary, beyond 400 feet of a terminal reservoir, if the applicant can demonstrate that degradation in water quality is occurring. Parameters used to demonstrate a degradation in water quality shall include:
  - Fecal coliform
  - Total coliform
  - Turbidity
  - Total Organic Carbon
  - *Giardia*
  - *Cryptosporidium*

### Actions

Following the submittal of a complete application, the DEP will conduct a site visit to determine if a threat exists to a water supply. The DEP/Wetlands Program, local Board of Health, and local conservation commission will be invited to any field visit for a determination. After the field visit, DEP will send the applicant a determination letter with a copy to the local Board of Health, Massachusetts Division of Fisheries and Wildlife, and Massachusetts Department of Public Health. DEP will try to issue its determination within 5 business days from receipt of a complete application. If that determination identifies that a threat exists, the applicant may petition the local Board of Health for an emergency permit to abate the threat. The determination from DEP will require that the applicant notify DEP within a specified time period as to the actions completed and whether the threat was successfully eliminated. Proposals for the removal or breaching of dams, or other actions which will lower water levels must receive the approval of the local conservation commission within the City/Town that the proposed action will take place.

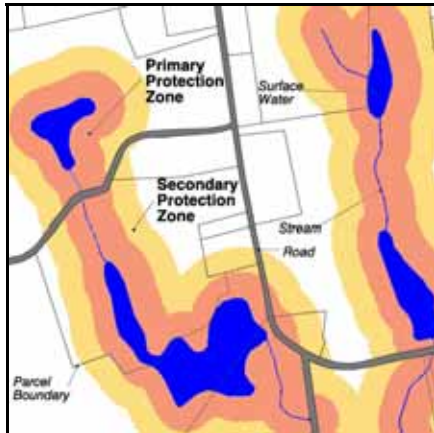
The emergency permit for trapping is for ten days during which trapping can be carried out and dams may be removed as allowed. There is authority by Fisheries and Wildlife for their Director to permit an extension for an additional 30 days.

## The Watershed Protection Act

The Watershed Protection Act (WsPA), MGL ch. 92, §107A/350 CMR 11.00, regulates land use and activities within critical areas of the Quabbin Reservoir, Ware River and Wachusett Reservoir watersheds in order to protect the quality of these drinking water sources. Administered by the Department of Conservation and Recreation, Division of Water Supply Protection, Office of Watershed Management, WsPA applies only in towns in these three watersheds. **See the back of this brochure for names of towns affected by the Watershed Protection Act.**

## Protected Zones and Restrictions

Two distinct areas are protected under the WsPA. **The Primary Protection Zone** is the area 400 feet from the edge of the reservoirs and 200 feet from tributaries and surface waters. Any alteration, as well as the generation, storage, disposal or discharge of pollutants are prohibited in the Primary Protection Zone.



The **Secondary Protection Zone** is the area between 200 and 400 feet from the banks of tributaries and surface waters, on land within flood plains, over some aquifers, and within bordering vegetated wetlands. Certain activities are specifically prohibited in the Secondary Protection Zone, including outdoor, uncovered storage of manure. See 350 CMR 11.04 for a complete list of activities prohibited by the Watershed Protection Act

## Horses and Drinking Water

The rural landscape of central Massachusetts has long supported horse ownership. Horse manure, however, contains nutrients that impair water quality and can contain pathogens that are potentially harmful to humans. Horses also have the potential to alter the run-off characteristics of the landscape, increasing the ability of pollutants to enter the drinking water supply. The Watershed Protection Act established protective buffers to help keep these contaminants out of the metropolitan Boston drinking water supply.

## Horses and the WsPA

Horses can be pastured in the Primary Protection Zone, although they can not over-graze an area and thus create an “Alteration.” *Please note, however, that State drinking water regulations do not allow stabling, hitching, standing, feeding or grazing within 100 feet of a tributary to a drinking water supply.* The WsPA does not allow the construction of a new structure, such as a barn, shed or fence, in the Primary Protection Zone unless an exemption is identified or a Variance is granted upon the owner demonstrating that the proposed work will not have an impact on water quality.

The Watershed Protection Act allows pasturing of animals in the Secondary Protection Zones. Some of the limits to working in the Secondary Protection Zone include: the total area of impervious surface, the outdoor storage of chemicals, and alterations to Bordering Vegetated Wetlands.

**Outdoor uncovered storage of manure is not allowed by the WsPA in either the Primary or Secondary Protection Zone.**

## Watershed Protection Act Exemptions

There are two exemptions to the Watershed Protection Act that a horse owner may possibly qualify to utilize.

350 CMR 11.05(2) allows for the “reconstruction, extension or structural change” to any structure lawfully in existence as of July 1, 1992. If an owner can demonstrate that a structure, such as a barn or paddock, existed as of July 1, 1992, then work can be done on it, as long as the construction “does not cause a substantial change and degrade the quality of the water in the Watershed.”

350 CMR 11.05(7) provides an Agricultural Use exemption. The WsPA utilizes the definition of “Agricultural Use” found in the Wetlands Protection Act (310 CMR 10.04). In order to obtain this exemption the land owner must provide proof that horses are actively being bred and raised for commercial purposes.

Please contact the appropriate DCR field office, as identified on the back of this brochure, if you have questions concerning the WsPA, exemptions, or variances. Additional information, including more detailed maps, are available on-line at [www.mass.gov/dcr/waterSupply/watershed/wspa.html](http://www.mass.gov/dcr/waterSupply/watershed/wspa.html).

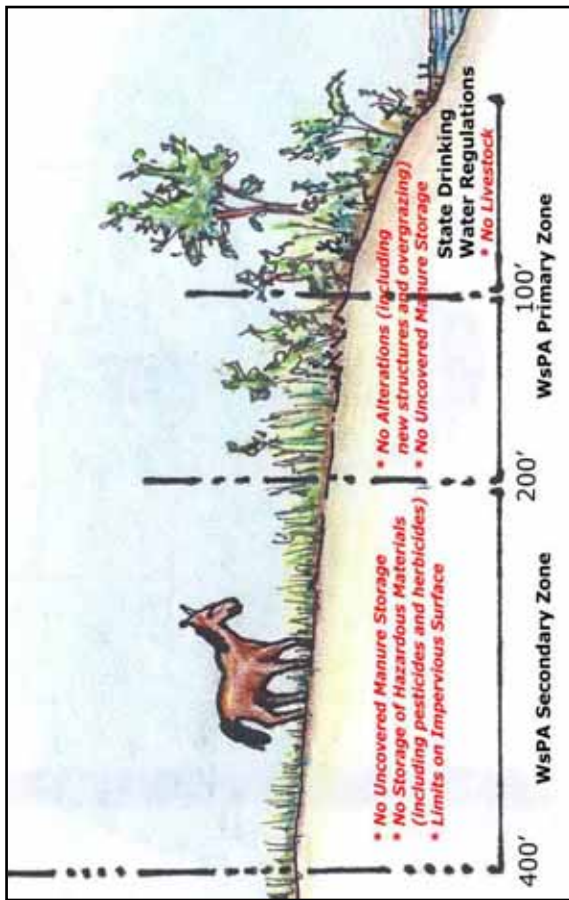
## Other Laws that Affect Horses

Another section of the DCR Office of Watershed Management regulations, 350 CMR 11.09, does not allow anyone, in general, to degrade the quality of water in the Watershed System. 350 CMR 11.09(1)(b)2 states that, “no person shall construct, establish or maintain any agricultural facility or place where animal manure may be deposited or accumulated without adequate provision to prevent any manure or other Pollutant from flowing or being washed into the Waters of the Watershed System.”

There are other state and local laws not administered by DCR that affect horse owners:

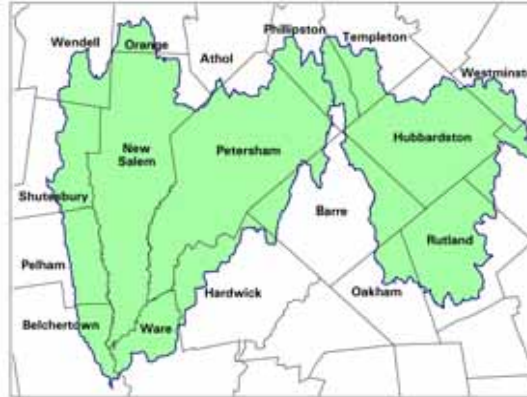
- State drinking water regulations, 310 CMR 22.20B(4), require that “No stabling, hitching, standing, feeding or grazing of livestock or other domestic animals shall be located, constructed, or maintained within 100 feet of the bank of a surface water source or tributary thereto.”
- The Wetlands Protection Act, 350 CMR 10.00, does not allow the alteration of bordering vegetated wetlands.
- There may also be local zoning and board of health regulations that could affect the location and management of horses.

**Property owners should contact their local Building Inspector, Conservation Commission, and Board of Health to identify all pertinent local regulations for a particular community.**



Regulatory setback requirements for horses and other livestock from tributaries to the Quabbin Reservoir, Ware River, and Wachusett Reservoir.

Regarding property in the shaded areas of these Quabbin Reservoir and Ware River watershed communities –



Contact: Department of Conservation & Recreation  
Division of Water Supply Protection  
Quabbin Reservoir Field Office  
485 Ware Rd.  
Belchertown, MA 01007  
ATTN: Jeff Lacy  
(413) 323-6921 x501

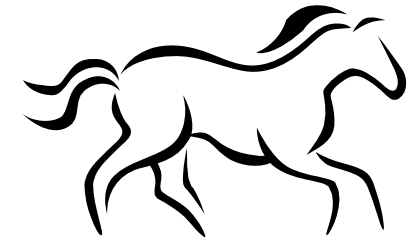
Regarding property in the shaded areas of these Wachusett Reservoir watershed communities –



Contact: Department of Conservation & Recreation  
Division of Water Supply Protection  
Wachusett Reservoir Field Office  
180 Beaman St.  
West Boylston, MA 01583  
ATTN: Nancy McGrath or Bill Moulton  
(508) 792-7423 x314 or x311

Information on the Watershed Protection Act is also available from the DCR website at [www.mass.gov/dcr/waterSupply/watershed/wspa.html](http://www.mass.gov/dcr/waterSupply/watershed/wspa.html).

## Horse Ownership and The Massachusetts Watershed Protection Act



How property owners with horses can meet the Watershed Protection Act regulations for land in the Quabbin Reservoir, Ware River, and Wachusett Reservoir Watersheds

### Additional Information

Appropriate pasture siting, manure management, and other agricultural Best Management Practices (BMPs) not only help protect drinking water, they also contribute to animal health and safety. More information and assistance is available from several federal, state, and private agencies, including:

- Natural Resources Conservation Service  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov) 413-253-4350
- MA Dept. of Environmental Protection  
[www.mass.gov/dep/water/resources/animal.htm](http://www.mass.gov/dep/water/resources/animal.htm) 508-767-2792
- MA Dept. of Agricultural Resources  
[www.mass.gov/agr/animalhealth/equine](http://www.mass.gov/agr/animalhealth/equine) 617-626-1700
- Massachusetts 4H  
[www.mass4h.org](http://www.mass4h.org) 800-374-4446
- New England Small Farm Institute  
[www.smallfarm.org](http://www.smallfarm.org) 413-323-4531

Commonwealth of Massachusetts  
Department of Conservation and Recreation  
Division of Water Supply Protection  
Office of Watershed Management

Deval L. Patrick, Governor  
Timothy P. Murray, Lt. Governor  
Ian A. Bowles, Secretary, EEOEA  
Richard K. Sullivan, Commissioner, DCR

July 2007





# MANURE IMPACTS ON SURFACE WATER QUALITY

The quality of water directly impacts the quality of our lives. Contaminated water eliminates drinking water supplies for our horses and families, degrades our recreational water resources, and destroys wildlife habitat. Water that does not soak into the ground, whether from rain, snowmelt, a hose, or leaking pipes, is called runoff. Runoff picks up contaminants, such as nutrients, pathogens, and bacteria from manure and can transport them to the nearest water resource (lake, pond, wetland, stream, or river). Certain site conditions, such as steep and unprotected slopes, lack of vegetative cover, and proximity to receiving waters will encourage manure and contaminants associated with manure from entering surface water resources. Pollution carried by runoff is called nonpoint source pollution (NPS). Proper manure management and runoff management will protect or improve water quality on your property, and in your community and watershed.

Manure contains nutrients, such as phosphorus and nitrogen, and pathogens, including bacteria, viruses and parasites. These pollutants contaminate water resources and reduce recreational potential of lakes and rivers, destroy wildlife habitat, and eliminate drinking water supplies for people and livestock.

## How does manure impact water resources?

When manure is deposited in water resources, either directly or by runoff, it can negatively impact water resources. The nutrients contained in manure, phosphorus and nitrogen, can be carried by runoff to the nearest water body, such as a pond, stream or lake. The nutrients then fertilize aquatic weeds and accelerate weed growth in lakes and ponds. The aquatic plants deplete oxygen levels, reducing the amount of oxygen available for other aquatic species such as fish. When the weeds die, additional oxygen is required for decomposition, further stressing oxygen stores and aquatic life. Direct manure entry into the water resource can also cause oxygen starvation due to increased biological oxygen demand (BOD), and result in fish kills. Algae blooms are another result of excess nutrients in the lake or pond. Algae blooms further reduce oxygen in the water body, can turn the water an unsightly murky green, and generate an unpleasant odor. Eutrophication (accelerated weed growth) and algae blooms kill fish and make swimming and boating unpleasant.

When the pathogens found in manure, including viruses, parasites, and bacteria such as fecal coliform and *e. coli*, are deposited into a stream or lake, swimming areas and shellfish beds may be closed. Pet and livestock drinking water supplies may be contaminated.

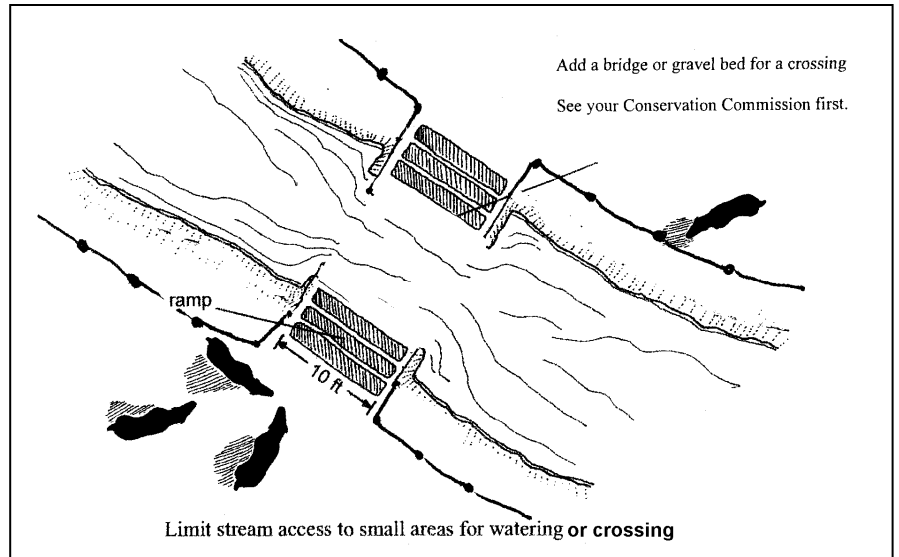
**This information is available in alternative format by calling our ADA Coordinator at (617) 574-6872.**

Produced by the Massachusetts Department of Environmental Protection, Municipal Services Section, Western Regional Office, 436 Dwight Street, Springfield, Massachusetts, 01103. 413-784-1100, TDD 413-746-6620. October 2000.

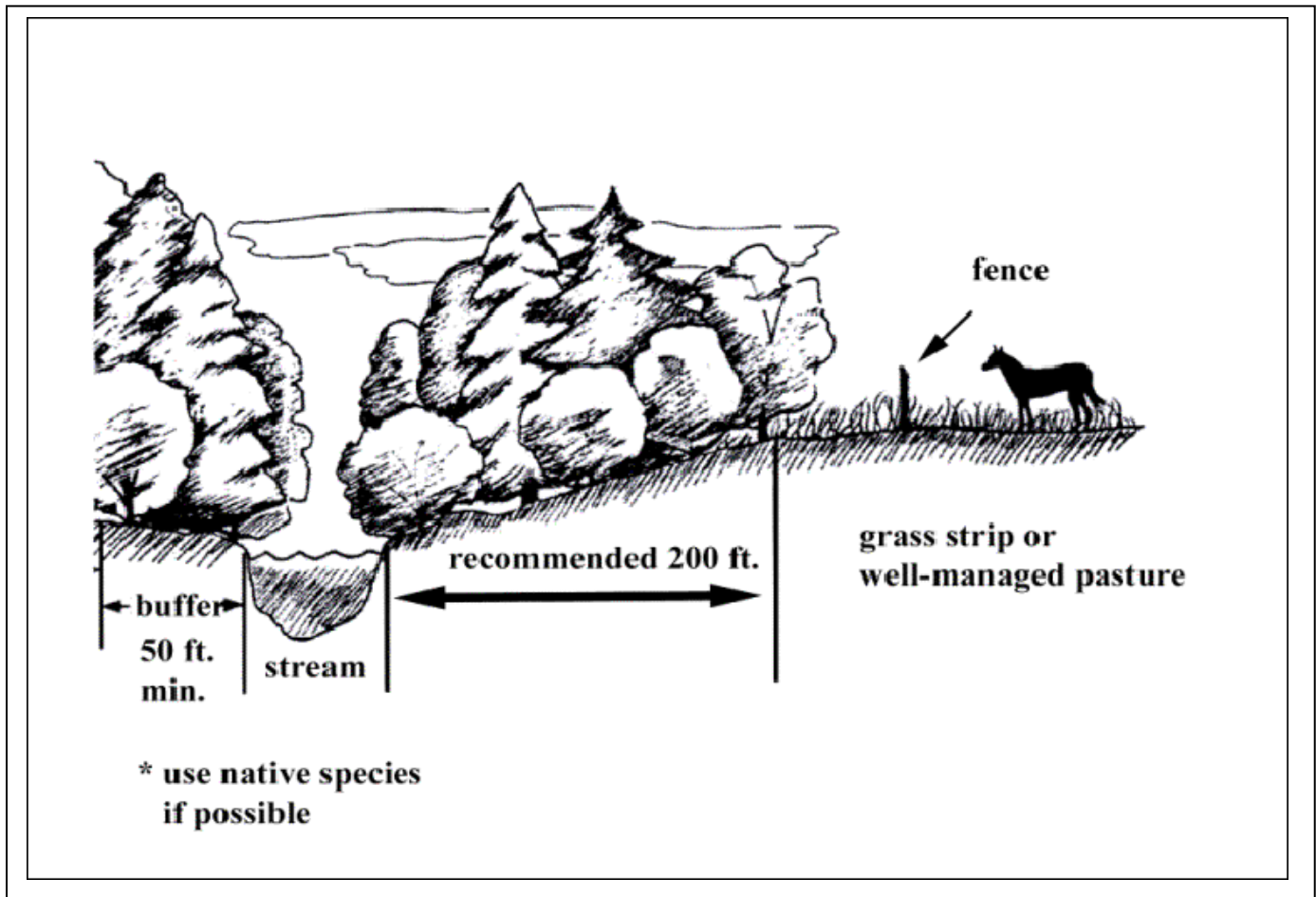


## What Can I do To Protect Water Quality?

***Prevent manure from being directly deposited in water resources.*** Keep horses out of streams, lakes, ponds and wetlands. If you can not completely fence your horse out of these areas, build water crossings to limit access as much as possible. (Note: Before installing anything in a waterbody you must contact your Conservation Commission.) Consider alternative water sources, such as troughs or an automatic watering system.



***Establish a vegetated buffer strip*** between horses and any water resources. Don't be discouraged if you have a small area to work with. Any buffer strip is better than none at all!





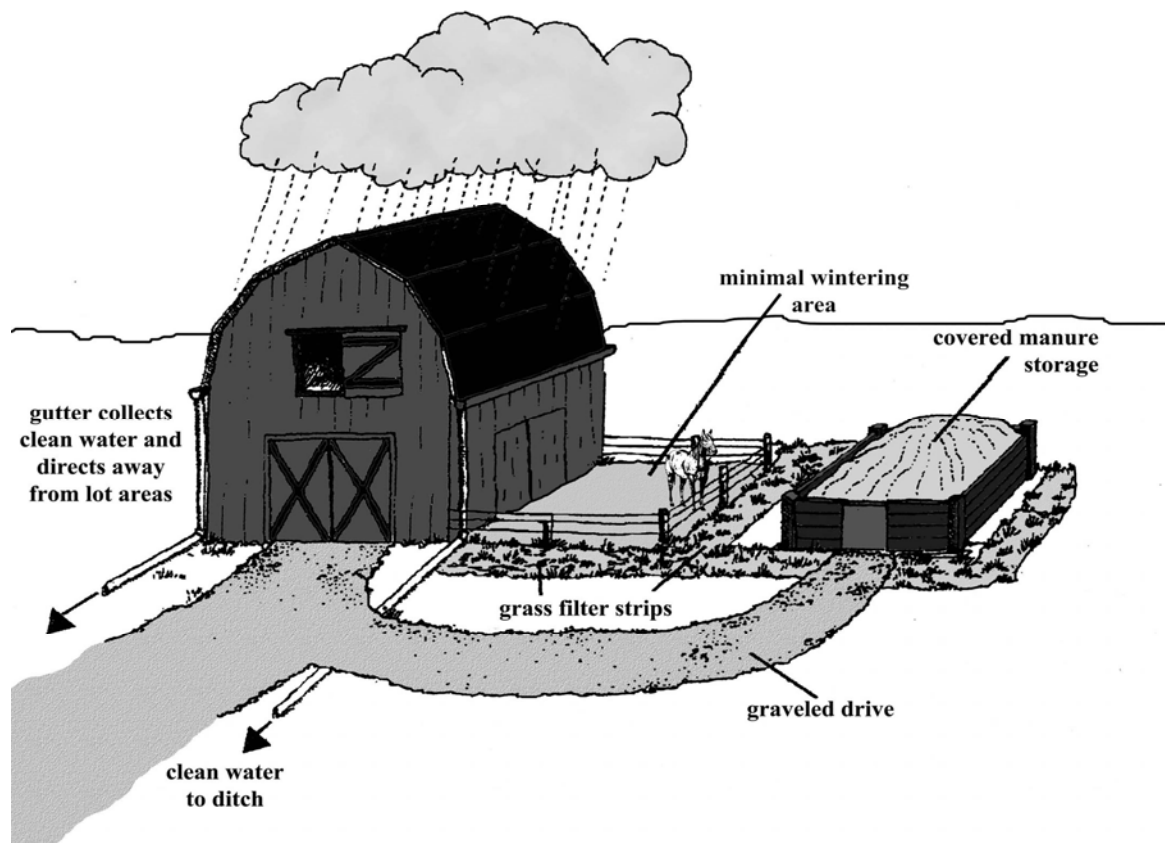
**Manage your horse's manure.** Proper manure management consists of containing manure, treating manure, and disposing of manure.

**Contain:** Pick up manure from stalls, paddocks and pastures on a daily or regular basis.

**Treat:** Composting manure is an effective way to transform waste into a valuable resource for your pastures and gardens. Maintaining a temperature of 135° to 160° will kill most pathogens, parasites and weed seeds. This means fewer flies on your property, reduced odors, and a reduced possibility of parasite infestation for your horse. Refer to the Composting fact sheet for more information.

**Dispose:** Composted manure is a valuable resource that can enhance the soil and fertilize your pastures and gardens. If you can rotate your pastures, composted manure can be spread in resting pastures during the growing season at no more than a ½ inch layer at a time. If manure is not composted, and you plan to spread it daily or routinely, spread manure on fields that will not be used for grazing, probably for at least a year. Composted manure can also be shared with horseless neighbors!

**Minimize runoff.** Encourage stormwater infiltration on your property to reduce runoff, and thus the transport of nutrients and pathogens to water resources. Small grassed depressions in your pasture can act as detention basins, capturing water, encouraging sediment and nutrients to filter out of the water, and encouraging infiltration. Roof gutters can direct rain and snowmelt to drywells or rain barrels. Divert storm runoff from high traffic areas and paddocks by constructing grassed swales or diversions.



## Additional Resources:

[http://www.ct.nrcs.usda.gov/programs/rc&d/km\\_heap-program.html](http://www.ct.nrcs.usda.gov/programs/rc&d/km_heap-program.html)

This link takes you to the Connecticut Horse Environmental Awareness Program (HEAP). The site contains a series of fact sheets, and educational resources on best management practices (BMPs).

<http://www.horsesforcleanwater.com/>

This link takes you to Horses for Clean Water, a non-profit environmental education organization based in Washington state. The site has several fact sheets on a number of manure related topics including composting, eliminating mud, and pasture management. Contact Alayne Bickle, program coordinator, at 425-432-6116 or via email at [alayne@horsesforcleanwater.com](mailto:alayne@horsesforcleanwater.com) for more information.

<http://www.extension.umn.edu/distribution/naturalresources/DD7540.html>

"Manure and Pasture Management for Recreational Horse Owners", a series of web sites by the University of Minnesota Extension Service. Includes plans for building a composting bin, detailed discussion of the composting process, information on pasture management, and an extensive list of additional sources of information.

[http://extension.unh.edu/resources/representation/Resource000002\\_Rep2.pdf](http://extension.unh.edu/resources/representation/Resource000002_Rep2.pdf)

This link takes you to the online version of the Good Neighbor Guide for Horse-Keeping: Manure Management, an excellent publication developed by the University of New Hampshire Cooperative Extension Service, New Hampshire Department of Environmental Services, and Natural Resources Conservation Service.

<http://oacd.org/>

A series of Small Acreage Fact Sheets by Oregon's Washington County Soil and Water Conservation District, including tips on controlling mud, providing alternative water sources for livestock, good and bad environmental practices, and a year-round calendar of activities for sound farm and pasture management. Click on "Small Acreage Landowner Fact Sheets" on the left side.

## Agency Resources

Massachusetts Department of Environmental Protection (MA DEP)

Nonpoint Source Coordinators (technical assistance and outreach): Jane Peirce, 508-767-2792 or [jane.peirce@state.ma.us](mailto:jane.peirce@state.ma.us).

*Massachusetts Department of Food and Agriculture*

<http://www.mass.gov/agr/programs/aeep/index.htm>

<http://www.nrcs.usda.gov>

The Natural Resources Conservation Service is a Federal agency that works in partnership with the American people to conserve and sustain our natural resources.

### Natural Resource Conservation Service Centers:

Berkshire CD	413-443-6867	Hampden-Hampshire CD	413-586-5440
Essex-Middlesex-Suffolk CD	978-692-1904	N.E.N.W., S. Worcester CD	508-829-6628
Bristol-Plymouth-Norfolk CD	508-295-5151	Cape Cod -Nantucket-Dukes CD	508-771-6476
UMass Cooperative Extension Service	413-545-4800		

## Betterments

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Communities may provide financial assistance to homeowners for the repair, replacement, or upgrade of failed on-site systems using Betterment Agreements. On-site sewage disposal systems include conventional septic systems and Innovative/Alternative (I/A) systems.

What is a Betterment Loan and how do I Apply?

A Betterment is a Financial Agreement between a homeowner and the community. The "Betterment Agreement" outlines the rights and responsibilities of the community and the homeowner for the repair, replacement or upgrade of the homeowner's on-site system. Either the homeowner or the community can contract to perform the necessary work. If you are interested, contact your local Board of Health for more information. This fact sheet provides some basic factual information as it relates to Betterment Agreements.

How does a Betterment Agreement Work?

- The community agrees to provide financial assistance to the homeowner to repair, replace and/or upgrade the on-site system or to do the work on the homeowner's behalf.
- If the homeowner performs the work, the homeowner agrees to repay, with interest, any money advanced by the community over an agreed upon period of time.
- If the community contracts to perform the work, the homeowner agrees to repay the community's costs, with interest, over an agreed upon period of time.
- The community establishes an account, similar to a loan, which will be paid on the homeowner's real estate tax bill.
- The community may obtain a first priority "municipal lien" on the homeowner's property if the repayments are not made on time.
- Even if the community contracts to perform the work, the on-site system remains the property of the homeowner.

What costs are eligible under Betterment Agreements?

- Betterment Agreements can fund on-site system repair and upgrade projects performed by the homeowner.
- Funds may be used for all costs necessary to repair or replace a failed on-site system or renovating the existing system.
- Costs incurred as they relate to hooking up to existing sewers.
- Costs expended in the replacement of a conventional on-site system with an approved Title 5-innovative/ alternative system.

How Does a Homeowner Repay a Betterment Loan?

The homeowner is liable for the repayment of all direct and indirect expenses incurred by the Board of Health in connection with the repair, replacement and/or upgrade of

the on-site system. Even if the community assumes responsibility for obtaining and contracting the necessary work, the system remains the property of the homeowner. The on-site system does not become a public facility by virtue of contracting the work. If a betterment lien exists against a property, it jumps ahead of any other outstanding debt on the property.

What steps are necessary for establishing a Betterment Program?

- Each community establishes priorities for making Betterment Agreements with homeowners
- Information on the Betterment Program is disseminated by local officials to the public
- Homeowners submit applications and petition Board of Health to enter into Betterment Agreements
- Board of Health reviews applications and develops a list of eligible homeowners
- Board of Health selects eligible homeowners based on criteria established locally and in accordance with state or local funding program requirements
- Eligible homeowners and Board of Health develop Betterment Agreements
- Notice of Betterment Agreement is recorded at the Registry of Deeds
- Board of Health undertakes its responsibilities under the Betterment Agreement.

For more detailed information on Betterments, contact your local Board of Health.

## Homeowner Septic System Checklist

## Septic System Description

Contact your local authority if you don't have this information.

Date system installed \_\_\_\_\_

## Installer

Phone \_\_\_\_\_

**Tank size** \_\_\_\_\_ **gallons**

**Capacity\_\_\_\_\_bedrooms**

Type ☐ conventional

☐ alternative (type)\_\_\_\_\_


**For more information about  
septic systems, contact:**



**U.S. Environmental Protection Agency**

[www.epa.gov/owm/onsite/](http://www.epa.gov/owm/onsite/)

## Things to keep in mind:

- ✓ *Inspect your system (every 1 to 3 years) and pump your tank (as necessary, generally every 3 to 5 years).*
  - ✓ *Use water efficiently.*
  - ✓ *Don't dispose of household hazardous wastes in sinks and toilets.*
  - ✓ *Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.*
  - ✓ *Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.*
- 
- Not in My Septic System**
- X Cloggers**  
diapers, cat litter, filters



**Not in My Septic System!**

**X Cloggers**  
diapers, cat litter  
filters

**Bloggers**  
diapers, cat litter, cigarette  
filters, coffee grounds,  
grease, feminine hygiene  
products, etc.

**X Killers**  
household

**killers**  
household chemicals,  
gasoline, oil, pesticides,  
antifreeze, paint, etc.

## Septic System Maintenance Record

[illegible]

**Place on electrical box (fuse box) or other convenient location.**



Student Name: \_\_\_\_\_

Household Member Name: \_\_\_\_\_

## Personal Water Use Chart

{ ----- To be filled in by student ----- }

Activity	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Total Number of Times	Estimated Amount of Water Used (gallons)	Total Weekly Water Use (gallons)
Washing face or hands									1	
Taking a shower (standard shower head)									50	
Taking a shower (low flow shower head)									25	
Taking a bath									40	
Brushing teeth (water running)									2	
Brushing teeth (water turned off)									0.25	
Flushing the toilet (standard flow toilet)									5	
Flushing the toilet (low flow toilet)									1.5	
Shaving									2	
Getting a drink									0.25	
Cooking a meal									3	
Washing dishes by hand									10	
Running a dishwasher									15	
Doing a load of laundry									30	
Watering lawn									300	
Washing car									50	
<b>Total Weekly Water Use by Household Member (gallons)</b>										