



Source Water Assessment Program (SWAP) Report for Rudolf Steiner School

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.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

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

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

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Table 1: Public Water System (PWS) Information

PWS Name	Rudolf Steiner School
PWS Address	6635 West Plain Road
City/Town	Great Barrington, Massachusetts
PWS ID Number	1113013
Local Contact	Director of Operations, Arthur Hildeth
Phone Number	413-528-4015

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
South well	1113013-02G	220	540	Moderate
North well	1113013-03G	100	411	High

INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect 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 contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. 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:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. DESCRIPTION OF THE WATER SYSTEM

The Wells

Rudolf Steiner School is a rural, private elementary school with buildings located on both the north and south sides of West Plain Road in Great Barrington. The north building serves a student and staff population of approximately 50 people per day while the south building serves approximately 276 people per day. The original shallow well for the south building (well 01G) was abandoned in 1990 when the new South well (02G) was installed, tested and approved in accordance with the DEP's New Source Approval Process. The North well (03G) supplies water to the north building.

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 an Interim Wellhead Protection Area (IWPA).

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

- **The IWPA** is the larger area that is likely to contribute water to the well.

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

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The South well has a Zone I protective radius of 220 feet and an Interim Wellhead Protection Area (IWPA) radius of 540 feet based on pumping test data and Zone I restrictions. Following a pumping test, the safe yield of the South Well was calculated to be approximately 37,440 gallons per day, (gpd) or 26 gallons per minute, (gpm). However, since the school and a property line are 220 feet from the well, the approved water withdrawal from the South well is limited to 7,000 gallons per day (5 gpm). Zone I restrictions allow only water supply related structures or activities within the Zone I, and the water supplier must own or control all of Zone I. Passive recreational activities are, with DEP approval, allowed under the Zone I restrictions. The North well has a Zone I radius of 100 feet and an IWPA radius of 420 feet based on daily use estimates from Title 5 septic system design flow criteria.

The South well, a 6-inch diameter well drilled to a depth of approximately 200 feet below ground, is located in the lawn approximately 220 feet from the building and is 550 feet from the Green River. The driller's log states that sand and gravel were noted from ground level to approximately 14 feet below ground, where bedrock was encountered. The bedrock was logged as interlayered beds of sandstone and shale to 41 feet, grading to limestone, the Stockbridge Formation dolomite, to the final well depth of 200 feet. The engineer's notes indicate the 34 feet deep casing was to be extended from 18 inches above ground to 76 feet below ground. The North well, a 6-inch diameter drilled well is located approximately 60 feet from the building. There is no other information about the depth or construction of the well, however it is assumed that the well is completed in the same bedrock formation as the South well.

Please refer to the attached maps of the Zone Is and IWPAs and Tables 2 and 3 for assessment information.

The Water Quality

For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas for Rudolf Steiner School, which are potential sources of contamination. The overall ranking of susceptibility to contamination for the North well is high and for the South well is moderate, based on the presence of land uses or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

Table 2: Table of Activities Common to the Protection Areas of Both Wells

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
School buildings	North well	South well	Moderate	Non-water supply structures and activities
Floor drains boiler room	North well	Both Wells	Moderate	Potential release of oil or boiler water to drain
Transportation corridor (West Plain Road)	No	Both wells	Moderate	Road salt, spills and runoff
Parking	No	Both wells	Moderate	Limit deicers, provide proper drainage from wells, and educate staff about leaks
Wastewater pipelines/septic components	No	Both wells	Moderate	Wastewater mains, tank and leachfield

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Table 2: Table of Activities Common to the Protection Areas of Both Wells (continued)

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Aboveground Fuel oil Storage Tank (AST)	No	Both wells	Moderate	Tank in Main (south) building in containment, tank in north building, does not have containment
Agricultural activities	No	Both wells	Low	Haying has minimal impact provided fertilizers are not used
Dairy Farm - Pesticide use (corn/alfalfa)	No	Both wells	High	Commercial application of pesticides
Dairy Farm - Manure spreading	No	Both wells	High	Liquid manure is spread on some of the fields

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Key Land Use Issues for the Wells include:

1. **Non-conforming uses in Zone I (North Well)**
2. **Floor drains in boiler rooms**
3. **Agricultural Activities – (Dairy Farm)**

1. **Zone I (North well)** – The North well is non-conforming with respect to the DEP land use restrictions, which allow only water supply related activities in Zone I. The Zone I for the North well contains the school building and some sewer lines. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

Recommendations:

- ✓ Do not conduct any additional activities within the Zone I. Monitor all activities within Zone I, use BMPs and train staff for emergency response. Contact MA DEP prior to conducting any new activities within Zone I.

- ✓ Consider replacement of sources or an alternative source of water if existing land uses cannot be mitigated. Contact the Department to discuss any expansion of the school well in advance of finalizing plans.

2. **Floor drains in boiler rooms** – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for hazardous materials to flow accidentally into the floor drain, however, preventive measures should be taken. The boilers at the Steiner school are small, residential size boilers (rather than large industrial boilers) that do not use any water treatment chemicals. The main boiler room in the south building has a floor drain and a 50-gallon oil, day tank in the room; the boiler is between the tank and the floor drain. Boiler room #2 at the south building does not have a floor drain or a day tank. The north building boiler room also has a floor drain. The oil tank at the north facility is located within an adjacent storage room in the north building. The discharge points for the floor drains are unknown but are assumed to be the septic system. The maintenance office also has a floor drain, however, if there are no hazardous materials (such as paints or stains) stored in the office, therefore there is no threat from the drain in the office.

Recommendations:

- ✓ In the main boiler room in the South building, it is recommended that a sealed berm of sufficient height (approximately 2 or 3-inches) be placed on the floor between the day tank and the boiler to retain the 50 gallons if a failure occurred. Any holes or cracks in the floor behind the berm should be sealed at the same time. Consider installing a berm around

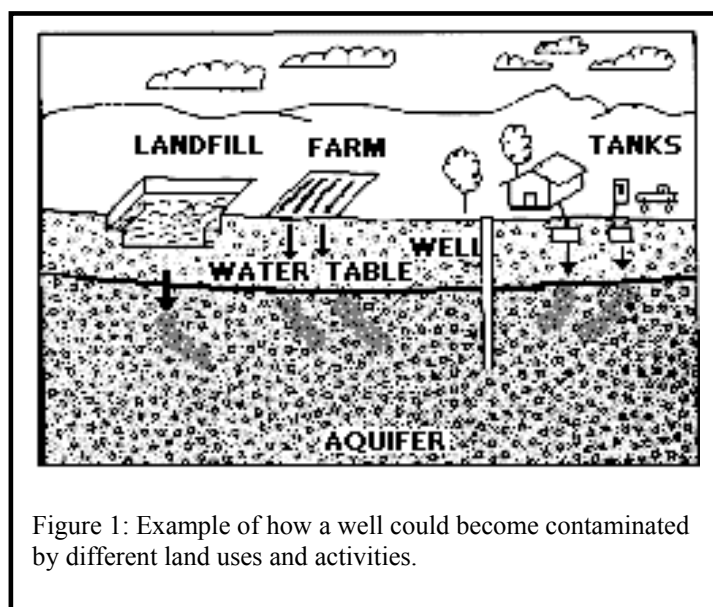


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to $\frac{1}{2}$ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

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 that resists penetration by water.

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

For More Information:

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

More information relating to drinking water and source protection is available on DEP's web site at: www.state.ma.us/dep/brp/dws.

the storage tank in the north building to contain 110% of the volume of that tank. If the boiler in the north building is moved to the back of the room (where the old boiler is currently located), consider installing a similar, shallow (\pm 2-inches) berm, between the boiler and the floor drain. Oil lines from the tank to the boiler can be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the bermed boiler. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. Request that your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. Please note that boiler blowdown water cannot be disposed of in the sanitary septic system and must be disposed of off site.

3. **Agricultural Activities (Dairy Farm)** – There are agricultural activities of various degrees in and adjacent to the IWPA's of the wells. The activities range from simply haying the fields without any soil improvements to spreading liquid cow manure and applying pesticides on cultivated cropland for the dairy farm. The licensed applicator is responsible for complying with regulations regarding application of products within the IWPA of the school well and additionally, in the Zone II of the Great Barrington Green River Infiltration Gallery.

Recommendations:

- ✓ Attempt to obtain an agreement from the farm owner/operator that they will:
 - Follow all applicable UMASS recommendations on Integrated Pest Management.
 - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
 - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.

Information on funding and other resources for agricultural management is available through the Massachusetts Department of Food and Agriculture at (617) 626-1700 or <http://www.massdfa.org/bureaus.htm>.

Other activities identified during the assessment that pose a potential threat to the water supplies are residential septic systems and household hazardous waste. Controlling runoff and monitoring parking areas for spills will minimize the potential threat from parking lot runoff.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

3. PROTECTION RECOMMENDATIONS

Rudolf Steiner School should review and adopt the following recommendations at the facilities:

Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I for both wells.
- ✓ Please note that water systems not meeting DEP Zone I requirements (North well), must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.

Additional Documents:

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

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

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

- ✓ Consider well relocation if Zone I threats cannot be mitigated or water quality is impacted (North well).
- ✓ Prohibit public access to the well and post signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check for accidental spills or leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Install berms and/or containment for oil tanks, sleeve the oil lines and seal any cracks or holes in the floor behind the berm.
- ✓ Request that your maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance.
- ✓ Maintain drinking water protection area signs at key visibility locations.

Training and Education:

- ✓ Train staff and faculty on proper hazardous material use, disposal, handling, emergency response, and best management practices; include custodial staff, certified operator, faculty and other appropriate staff.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of any potentially hazardous materials, such as paints or stains.
- ✓ Continue the current policy of using Best Management Practices (BMPs) for the use of pesticides on facility property.

Planning:

- ✓ Contact local officials in town to notify them that your facility is currently within the Great Barrington, Green River Infiltration Gallery's Zone II and Aquifer Protection District to assist you in improving protection.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agriculture:

- ✓ Attempt to obtain an agreement from the farm owner/operator that they will:
 - Follow all applicable UMASS recommendations on Integrated Pest Management.
 - Become certified in UMASS/Natural Resource Conservation Service Nutrient Management Certification program.
 - Obtain and follow a Farm Plan through Natural Resource Conservation Service. Alternatively, complete and follow a plan developed through the publication *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*.
- ✓ Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) or DFA.

Funding:

- ✓ The Department's Source Water and Wellhead Protection Grant Programs provide funds to assist public water suppliers in addressing Wellhead and other source water protection through local projects. Protection recommendations discussed in this document may be eligible for funding under these Grant Programs. For additional information, please refer to the attached program fact sheets. Please note, the Request for Response (RFR - application forms) for the Grant programs are posted each fiscal year about May 1 and due back about June 30. Contact Catherine V. Skiba at 413-755-2119 for more information on the programs. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussions to assist the water supplier in his efforts to protect and improve the water supply and further review overall local drinking water protection measures.

4. ATTACHMENTS

- ◆ Map of the Public Water Supply (PWS) Protection Area
- ◆ Septic System Brochure
- ◆ Summary of Recommended Source Water Protection Measures
- ◆ *On Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices*

Additional Reference Documents:

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at www.state.ma.us/dep/brp/dws, including:

- ◆ Best Management Practice information, and general water supply protection information
- ◆ MA DEP SWAP Strategy
- ◆ Land Use Pollution Potential Matrix
- ◆ Draft Land/Associated Contaminants Matrix