

Healthy Drinking Waters

for

M A S S A C H U S E T T S

Safe and healthy lives in safe and healthy communities

Residential Well Water Testing

If you have a private well as a drinking water source, water quality testing should be important to you and your family.

Some contaminants in drinking water have been linked to cancer and toxicity, posing a risk to human health. Many contaminants often have no taste, odor, or color. Their presence can only be determined by laboratory testing.

Private Water Supplies

Private well owners are responsible for the quality of their drinking water. The U.S. Environmental Protection Agency (EPA) does not regulate private wells. Homeowners with private wells are generally not required to test their drinking water, although local Boards of Health or mortgage lenders may require well water testing. While there is also no state requirement to have your well water tested, the Massachusetts Department of Environmental Protection (MassDEP) recommends that all homeowners with private wells do so, and use a state certified testing laboratory. Homeowners can use the public drinking water standards as guidelines to ensure drinking water quality. We suggest you test your water annually for the more common contaminants. Even if your current water supply proves to be clean and safe to drink, regular testing is important because it establishes a record of water quality that may help solve future problems.

Additionally, if there are known contami-



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nation problems in your area and if neighbors have experienced well water contamination, you should consider testing your drinking water for those contaminants. Know the history of your neighborhood and whether or not there are water quality problems from either natural or manmade contaminants.

Drinking Water Standards

As authorized by the 1974 Safe Drinking Water Act and its amendments, the EPA has established limits, or standards, on the concentrations of certain contaminants that are allowed in public drinking water supplies. These standards are set to protect public health by ensuring good water quality. EPA standards for drinking water fall into two categories: primary standards and secondary standards. Refer to the fact sheet *Drinking Water Standards* for more information.



Healthy Drinking Waters for Massachusetts

Residential Well Water Testing

When should you test your water?

Use the following testing frequencies as guidelines, but test more often if you suspect a problem or notice a sudden change in the quality of your drinking water.

- Once each year, get a routine analysis to test for total coliform bacteria, nitrate, and sodium. All are good general indicators of water quality. In addition, test the pH of your well water every 3 to 5 years; this will help you to determine the acidity of the water and whether you might have problems with pipe pitting and leaching of metals from the plumbing. The best times to test are usually after a spring or summer rainy period or after repair or replacements of your well, pump, or water pipes.
- Whenever you notice a change in taste, color, odor, turbidity (indicated by cloudiness), or sediments, or if you think your water quality has changed, as indicated by unexplained household illness.
- If household plumbing contains lead pipes, fittings, or solder joints: test for pH, lead, copper, cadmium and zinc. Brass contains 3-8% lead and may be found in your fixtures or on parts of the well pump. Chrome contains brass. For this reason, you should test for lead every 3 to 5 years.
- If there are children under 6 years old living in a house, test for lead every year. If there are children under 12 years of age, include a fluoride test.
- If you wish to monitor the efficiency and performance of home water treatment equipment: test for the specific contaminant(s) being treated upon installation of a treatment device, at regular intervals after installation, and if you notice a change in water quality as indicated by odor, taste, color, turbidity, sediments, or other conditions. Comparing water



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tests of untreated and treated water will help you determine if the treatment system is doing its job.

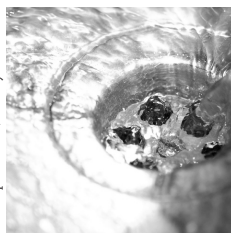
How should you collect a water sample?

Most water testing laboratories supply their own sample containers and detailed instruction on how to properly collect a water sample. Use the bottles provided and carefully follow laboratory instructions to obtain a good sample. Complete all forms that come with the containers so that your sample can be processed quickly and accurately. Make sure you understand the sampling procedure before you begin.

How to take a sample varies depending on the tests being done. For example, some contaminants such as lead and copper may require that water remains stagnant in the pipes for a minimum of 6 hours and is collected on the first draw of water. Other contaminants



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Healthy Drinking Waters *for* Massachusetts

Residential Well Water Testing

Summary of Water Testing

Problem	Common Signs/ Situations	Causes	Test Recommended
Rusty colored water	Rust stains on clothing and porcelain plumbing fixtures. Metallic taste to water. Rust coating in toilet tank. Tap water turns rust colored after exposure to air.	Iron or manganese, or iron bacteria	Iron Manganese
Blue stains	Copper plumbing Blue stains on plumbing, fixtures, and laundry	Corrosive water (low pH) is leaching copper from plumbing.	Copper pH Sulfate
"Rotten egg" odor	Iron, steel, or copper parts of pumps, pipes, and fixtures corroded. Fine black particles in water. Silverware turns black.	Hydrogen sulfide gas, sulfate-reducing bacteria, or sulfur bacteria.	Odor Hydrogen sulfide Sulfate If home built before 1990, lead.
Corrosive water	Metal parts on pump, piping, tank and fixtures corroded. Red stains from corrosion or galvanized pipe; blue-green stains from corrosion of copper or brass.	Corrosive water (low pH) is naturally occurring in Massachusetts groundwater.	pH Sulfate If home built before 1990, lead If copper pipes, copper
Cloudy turbid water	"Dirty" or muddy appearance	Silt, sediment, microorganisms	Check well construction with local well driller. Turbidity Bacteria
Frothy, sudsy water	Water appears frothy	Malfunctioning septic system	Detergent tests
Chemical odor Fuel odor	Underground fuel storage tank nearby; gas station; improper use, storage, or disposal of fuels used around the home (car, lawn mower, other gas-powered machines)	Leaking underground fuel storage tank Fuel spills	Volatile organic chemical scan
Unusual chemical odor	Well near dump, junkyard, landfill, industrial facilities, dry cleaners, gas stations	Groundwater contamination by chemicals	Organic chemical scan Heavy metals Consult with Board of Health on test suggestions.
Fruity odor	Underground fuel storage tank nearby; gas station; improper use, storage, or disposal of fuels used around the home (car, lawn mower, other gas-powered machines); well close to road	Fuel spill, leaking underground fuel storage tank, road runoff ponding near well	Volatile organic chemical scan
Recurrent gastrointestinal illness	Stomach problems, nausea, diarrhea	Bacterial contamination, cracked well casing, malfunctioning septic system	Bacteria Nitrate Detergent tests
Sodium restricted diet, salty brackish taste	Well near the coast, a salt storage pile, or heavily salted roadway	Saltwater intrusion, groundwater contamination, ion exchange water treatment system	Chloride Sodium Total Dissolved Solids (TDS)
No obvious problem	Well is in an area of past or present apple orchards	Arsenic in pesticide formulations	Arsenic
No obvious problem	Well is in an agricultural area	Pesticide leaching from agricultural practices	Check with Board of Health for known contaminant problems Test for pesticides used in the area Nitrate

Healthy Drinking Waters for Massachusetts

Residential Well Water Testing

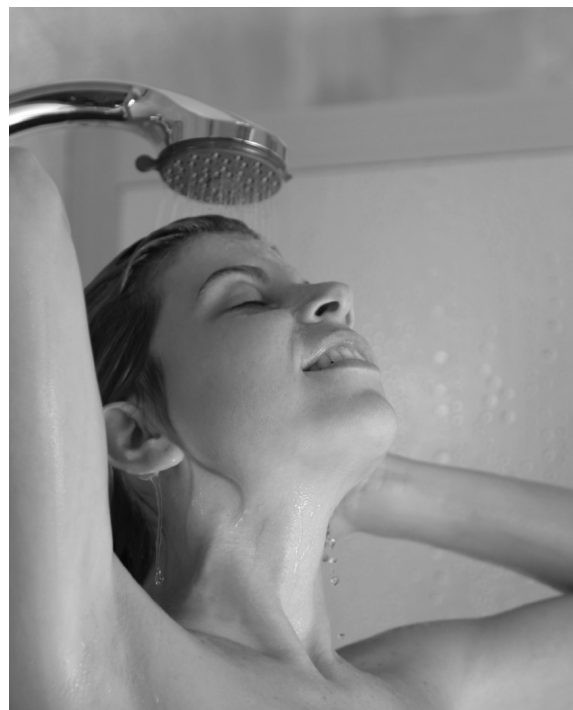
require that the water be flushed or run for a minimum period of time before collecting the sample. Some contaminants require special sample bottles and procedures. Cleanliness is a must. Make sure that nothing but the water comes in contact with the opening of the bottle or the inside of the cap.

Timeliness is important, too. Some contaminants deteriorate or change form with time. Most water samples need to be kept cool when being taken to the lab. To assure accurate results, make certain the lab receives your water sample within the specified time directed on the instructions. For example, some labs may not accept certain water samples on a Friday, as the test procedure must be started within 24 hours. If you have a water sample that is going to be tested for volatile organic compounds (VOCs), don't stop for gas with the sample in the car; the sample could be contaminated by gas vapors.

Where can you have your water tested?

If you choose to have your water tested at a private laboratory, be sure it is a MassDEP-certified lab. Certification means that the lab is using accepted testing procedures. It is also important to confirm that the lab is certified to test for the contaminants you want to test. For example, some labs may be certified to test for microbiology, but not for inorganics, which includes nitrate, fluoride, and sodium. MassDEP maintains a list of certified labs at <http://www.mass.gov/dep/service/compliance/wespub02.htm>. Some of the listed labs are associated with public water suppliers and do not accept private clients. Check the website to make sure the lab is certified to test for the contaminants you are requesting, get answers to the following questions:

- Do you accept samples to test individual homeowner well water?



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- What type of screening packages do you offer?
- How much does it cost?
- Do I pick up the sample bottles or will you send them to me?
- How much time do I have to bring the sample back to the lab?
- How long will it take to get results?

Keep records

Keep a record of all your water tests as a reference. Include the date and the test results. A change in the concentration of a contaminant may indicate that a water quality problem is developing. By comparing test results, you may find that a change in treatment is necessary or that a treatment device is not functioning properly.

Interpreting the test results

Once the tests are completed, you are faced with interpreting any positive results. The presence of a contaminant is not always an indication of a health hazard or a serious nuisance. It is the level at which it is found that is most important. Discuss the test results with your Board of Health, or other qualified professional.

If the well owner finds that the well is contaminated with levels that might have significant health effects, the well should not be used. At this point there are four basic alternatives:

1. Install a new well.
2. Connect with a public drinking water system (if available).
3. Use bottled water.
4. Install a treatment system.

Certain nuisance contaminants, such as hydrogen sulfide or sodium, can also render the need for alternative water sources or at home treatment when found at high enough levels. Refer to fact sheets about certain problematic contaminants in drinking water for more information.

Protection of Private Drinking Water Supplies

You can protect your private well by paying careful attention to what you do in and around your home as well as your neighbor's activities near your well. Regular testing and adopting practices to prevent contamination can help ensure that your well supplies you and your family with good quality drinking water. For more information on well protection see the fact sheet entitled *Drinking Water Wells*.

Resources

UMass Extension

This fact sheet is one in a series on drinking water wells, testing, protection, common contaminants, and home water treatment methods available on-line at the University of Massachusetts website:

http://www.umass.edu/nrec/watershed_water_quality/watershed_online_docs.html and Cape Cod Cooperative Extension: 508-375-6699

<http://www.capecodextension.org>

MA Department of Environmental Protection, Division of Environmental Analysis

Offers assistance, information on testing and state certified laboratories: 617-292-5770

For a listing of MassDEP certified private laboratories in Massachusetts:

<http://www.mass.gov/dep/service/compliance/wespub02.htm>

U.S. Environmental Protection Agency, New England Office

Information and education on where drinking water comes from; drinking water testing and national laws; and how to prevent contamination:

<http://www.epa.gov/ne/eco/drinkwater>

US Environmental Protection Agency

For a complete list of primary and secondary drinking water standards:

<http://www.epa.gov/safewater>

MA Department of Conservation and Recreation, Division of Water Supply Protection

Maintains listing of registered well drillers, information on well location and construction: 617-626-1409

<http://www.mass.gov/dcr/waterSupply/welldril/index.htm>

NSF International

The NSF International has tested and certified treatment systems since 1965. For information on water treatment systems:

800-NSF-MARK (800-673-6275)

<http://www.nsf.org/consumer/>

Water Quality Association

The Water Quality Association is a not-for-profit international trade association representing the household, commercial, industrial, and small community water treatment industry. For information on water quality contaminants and treatment systems:

<http://www.wqa.org>



UMass Extension



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