

Testing Well Water

Basic Information You Should Know

Private well owners are encouraged to perform annual water testing as an essential maintenance practice in order to keep drinking water safe. The following information includes recommendations for well water testing.

Recommended Testing

At a minimum, well water should be tested every year for bacteria, the most common water quality problem. Other tests may be needed, depending on where you live and what is located near your drinking water supply.

Table 1 describes some conditions that may suggest testing for select contaminants. Table 2 lists the limits for some primary contaminants. Finally, table 3 discusses which wells or homes should be tested and how often.

For example, if a well is located in an area of intensive agricultural use, testing should be done for nitrates and pesticides commonly used in that environment. If household tests for radon in the air are very high, well owners should arrange for testing of radon in the water. If there are problems with taste, odor, staining, or color of the water, levels of iron, manganese, and sulfate should be tested.

Testing more than once a year may be warranted in special situations:

- Someone in the household is pregnant or nursing
- There are unexplained illnesses in the family
- Neighbors find a dangerous contaminant in their water
- A change in water taste, odor, color, or clarity is noted
- There has been a spill of chemicals or fuels into or near a well

For guidance in selecting tests, contact the wellcare® hotline at 1-888-395-1033, a water well professional, the local health department, cooperative extension service, or state health or environmental agency.

Choosing a Testing Lab

You or your patients can get an up-to-date list of all state-approved laboratories and the specific tests they are certified to perform from the local or state health department. Check with individual laboratories to get prices. Ask how soon to expect results (not more than two weeks) and about the information that will be provided with the test results. A good lab should help interpret the results and make sense of the scientific data. The wellcare® hotline staff can also assist in interpreting test results.

Table 1: Tests for Specific Conditions

Conditions of Nearby Activities	Recommended Test
Recurrent gastrointestinal illness	Coliform bacteria
Household plumbing may contain lead	pH, alkalinity, hardness, lead, copper
Radon present in indoor air or region	Radon
Scaly residues, soaps don't lather	Hardness
Water softener to treat hardness	Manganese, iron (before purchase)
Stained plumbing fixtures, laundry	Iron, copper, manganese
Objectionable taste or smell	Hydrogen sulfide, corrosion, pH, alkalinity, hardness, metals
Water is cloudy, frothy, or colored	Color, detergents
Corrosion of pipes, plumbing	Corrosion, pH, alkalinity, lead, copper
Rapid wear of water treatment equipment	pH, corrosion, alkalinity, hardness
Nearby areas of intensive agriculture	Nitrate, pesticides, coliform bacteria
Nearby coal, other mining operation	Metals, pH, corrosion
Gas drilling operation nearby	Chloride, sodium, barium, strontium
Gasoline or fuel oil odor	Volatile organic compounds (VOCs)
Dump, landfill, factory, or dry-cleaning operation nearby	VOCs, pH, sulfate, chloride, metals
Salty taste and seawater, or a heavily salted roadway nearby	Chloride, TDS, sodium

Table 2: Tests for Specific Contaminants

Arsenic	Baseline test in areas prone to arsenic/annually after treatment	State laboratory	10 parts/billion (EPA)
Bacteria	Annually in spring; newborn in house; well equipment installed	Local health department test of total coliforms	Positive test for total coliforms, presence of fecal coliforms
Chromium	In at-risk-states*	State laboratory	100 parts/billion
Iron	Water red, rusty	State laboratory	300 parts/billion
MTBE (methyl tertiary butyl ether)	Water has nasty smell in area where MTBE used	State laboratory	20 parts/billion
Nitrate	Annually in farm areas, pregnant woman in house	State laboratory	10 parts per million
Radium	Shallow well in area with high radium in bedrock	State laboratory	5 picocuries per liter
Radon	Before buy/move into new house	State laboratory	2,000 picocuries per liter
Sulfur & Manganese	Bitter taste, rotten egg odor	Local health department	250 parts/million
TCE (trichloroethylene)	In at-risk states**	State laboratory	5 parts/billion

***Chromium at-risk states:** California, Connecticut, Delaware, Illinois, Indiana, Maryland, New York, New Jersey, Pennsylvania, Texas, and Wisconsin

****TCE at-risk states:** Pennsylvania, Illinois, Georgia, Texas, Massachusetts, and West Virginia

Table 3: Which Wells to Test and How Often

Contaminant	Wells/Homes that need testing	How often to test
Coliform Bacteria	<ul style="list-style-type: none"> All wells 	<ul style="list-style-type: none"> Change in taste, color, odor At least once a year
Nitrate	<ul style="list-style-type: none"> Newly-constructed wells Wells that have not previously been tested Wells used by pregnant women/infants Wells located within 1 mile of fertilized fields/animal feed lots or aging septic tanks Wells that previously had nitrate levels close to 10 parts per million 	<ul style="list-style-type: none"> Two tests 6 months apart Before pregnancy and at time of birth Once a year Once a year
Pesticides	<ul style="list-style-type: none"> Wells located within 1 mile of agricultural fields, or pesticide manufacturing, storage or mixing facilities 	<ul style="list-style-type: none"> Once every 5-10 years
Lead	<ul style="list-style-type: none"> Homes with copper plumbing installed before 1985 Homes with brass fixtures Homes with naturally-soft water Wells used by pregnant women/infants 	<ul style="list-style-type: none"> Once a year

Copper	<ul style="list-style-type: none"> • Water to be used for infant formula • Residents with repeated symptoms of nausea, diarrhea, or abdominal cramps 	<ul style="list-style-type: none"> • Test before and after flushing the faucet for 2-3 minutes • If home has new copper plumbing, retest in 6 months
VOCs (solvents, gasoline, fuel oil)	<ul style="list-style-type: none"> • Wells within 1 mile of where solvents have been used or spilled • Water that has an oily sheen 	<ul style="list-style-type: none"> • Test every 5-10 years • Test if taste or odor exists
PCBs	<ul style="list-style-type: none"> • Water that has an oily sheen • Water that has a petroleum odor • House with submersible pump installed before 1979 	<ul style="list-style-type: none"> • Test once when necessary
Arsenic	<ul style="list-style-type: none"> • All wells should be tested for arsenic 	<ul style="list-style-type: none"> • Test annually
Boron	<ul style="list-style-type: none"> • Wells that are located within 1 mile of a fly ash landfill 	<ul style="list-style-type: none"> • Test every 5-10 years
Radon	<ul style="list-style-type: none"> • Homes with high levels of radon in the air 	<ul style="list-style-type: none"> • Test once when necessary

Taking a Water Sample

The laboratory chosen should provide specific sampling instructions and clean bottles or small plastic bags for collecting the water sample. Lab containers should not be rinsed or filled to the top. Check to see if the sample must be refrigerated or treated with special chemicals.

It may be necessary to take a sample from the tap with the first flush of water in the morning or after the tap has been allowed to run for a period of time. If there is suspicion that there may be a problem somewhere in the home plumbing, samples may need to be taken from several points: before and after water enters the hot water tank, for example, or at the inlet and outlet of a filtering device. If testing for evidence of corrosion, allow the water to stand in the plumbing system for at least 12 hours.

Instructions for taking samples should carefully be followed. Sampling is the most important part of testing, and carelessly collected samples can yield inaccurate results.

How to collect water samples:

Step 1: Remove the aerator from an indoor, lead-free, cold water faucet. If testing for bacteria, flame the end of the faucet with a lighter to destroy any organisms in the tap itself.

Step 2: Let water run for five minutes to bring in water that has not been in contact with household plumbing.

Step 3: Reduce the water flow until the stream is about 1/4-inch in diameter.

Step 4: Fill the special container as instructed by the testing laboratory. Do not let anything touch the inside of the cap or the container.

Step 5: Close the sample container and transport it as instructed by the laboratory.

Understanding Test Results

The report of analysis, as some laboratories call test results, can take a variety of forms. It may be a computer printout of results from the specific tests requested or a preprinted form with the results typed or written into blocks or spaces. It may include some general information about the laboratory that performs the test and the types of tests that were done or it may provide only the results.

The amount of a specific contaminant in the water sample will be expressed as a concentration of a specific weight of the substance in a specific volume of water. The most commonly used concentration units for drinking water analyses are provided in Table 2.

The test results also may use other symbols and abbreviations. Laboratory methods have detection limits, or levels below which contaminants cannot be reliably detected. That does not necessarily mean that the chemical is not present. There could be so little present that it cannot be reliably detected with the laboratory equipment or testing procedures being used.

The important question is whether the contaminant poses a health threat at the particular concentration. Compare the water test results to the federal standards in Table 2 and to other guidance numbers, such as health advisories, to assess the potential for health problems. If in doubt, contact the wellcare® hotline, state health department or environmental agency, the local extension service, or the well water contractor.

After you get the first test results, it is recommended to follow up with a second test taken at a different time, before deciding on any water treatment. This is because there is a certain margin of error in water testing, and contamination problems may vary.

Additional Resources

The following sites provide up-to-date information on efforts to protect water supplies and steps you can take as a private well owner:

Water Quality Association www.wqa.org

The Groundwater Foundation www.groundwater.org

For more information about wells and other wellcare® publications

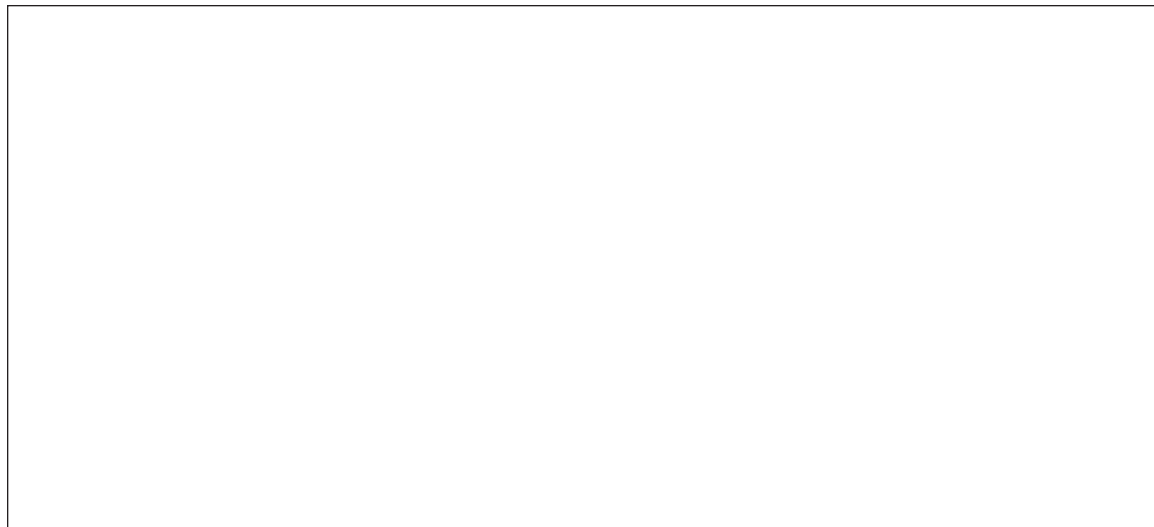
wellcare® is a program of the **Water Systems Council (WSC)**. WSC is the only national organization solely focused on protecting the health and water supply of the 43 million people nationwide who depend on wells for their water supply.



This publication is one in a series of wellcare® information sheets that can be downloaded for FREE from the WSC website at www.watersystemscouncil.org. Healthcare providers, well owners and others with questions about wells or ground water can contact the wellcare® hotline at 1-888-395-1033 or visit www.wellcarehotline.org. You may also want to join the wellcare® Well Owners Network. To join call 1-888-395-1033 or visit www.watersystemscouncil.org. MEMBERSHIP IS FREE!

Association of Clinicians for the Underserved

The Association of Clinicians for the Underserved (ACU) participated in the writing and research for this information sheet. The ACU is a nonprofit, transdisciplinary organization of clinicians, advocates and health care organizations united in a common mission to improve the health of America's underserved populations and to enhance the development and support of the health care clinicians serving these populations. Please visit the ACU at www.clinicians.org.



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