

Acing the Test

By Margaret Martens

Approximately 30 million Americans get their drinking water from private household wells. Protection of private wells does not fall under the U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Act, so well owners must take it upon themselves to ensure their water quality. To keep water clean and pure and the well operating at peak performance, regular water testing is an important maintenance tool.

At a minimum, well water should be tested every year for bacteria, the most common water quality problem. Other tests may be required, depending on the region and potential contaminants located near the water supply.

If the well is in an area of intensive agricultural use, testing for nitrates and possibly ammonia and the pesticides commonly used in that region is necessary. If household tests for radon in the air are high, it is critical to test for radon in the water. If there are problems with water taste, odor, staining or color, then test iron, manganese, chlorine and sulfate levels.

Testing more than once a year may be warranted in special situations, such as when:

- Someone in the household is

pregnant or nursing.

- There are unexplained illnesses in the family.
- Neighbors find a dangerous contaminant in their water.
- There is a change in water taste, odor, color or clarity.
- There is a spill of chemicals or fuel into or near the well.

Contact the local health department, cooperative extension service, state health or environmental agency or a well professional for guidance in selecting tests. Table 1 describes some conditions that may prompt testing for select contaminants.

Choosing Wisely

If you are using a third-party agency for water testing, approach it as a smart shopper. Get an up-to-date list of all state-approved laboratories and

the specific tests they are certified to perform from the state health or environmental agency. Check with individual laboratories to get prices. Ask how soon to expect results 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 laboratory chosen should provide specific sampling instructions and clean bottles in which to collect the water samples. Carefully follow instructions for taking samples. This is the most important part of testing—a carelessly collected sample can give inaccurate results.

The report of analysis, or test results, can take a variety of forms. It may be a computer printout of results for the specific tests requested, or a preprinted form with the results typed or written into blocks or spaces. It

Selecting the right combination of tests for water wells

Table 1. Tests for Specific Conditions

Conditions or Nearby Activities	Recommended Test
Recurrent gastrointestinal illness	Coliform bacteria
Household plumbing contains lead	Lead, copper, pH, carbon dioxide
Radon present in indoor air or region	Radon
Scaly residues; soaps do not lather	Hardness, sulfate
Water softener to treat hardness	Hardness, iron, manganese (before purchase)
Stained plumbing fixtures or laundry	Hardness, iron, manganese, sulfate, pH, tannins
Objectionable taste or smell	Hydrogen sulfide, sulfate, chlorine
Cloudy, frothy or colored water	Turbidity, color, tannins
Corrosion of pipe/plumbing	Lead, copper, pH, carbon dioxide
Nearby areas of intensive agriculture	Coliform bacteria, nitrate, pesticides
Nearby coal or other mining operation	Metals, pH, carbon dioxide, total dissolved solids (TDS)
Gas drilling operation nearby	Barium, chloride, sodium, strontium, TDS
Gasoline or fuel oil odor	Volatile organic compounds (VOCs)
Dump, landfill, factory or dry-cleaning operation nearby	Metals, pH, salts, VOCs, synthetic organic compounds
Salty taste/seawater, or a heavily salted roadway nearby	Chloride, sodium, TDS, boron

Table 2. Tests & Maximum Limits for Specific Contaminants

Contaminant	When to Test	How to Test	When to Treat/Maximum Limits
Arsenic	Baseline test in areas prone to arsenic; annually after treatment	Certified laboratory	10 ppb
Bacteria	Annually in spring; newborn in house; well equipment installed	Certified laboratory test of total coliforms	Positive test for total coliforms; presence of fecal coliforms
Chromium	Near steel/pulp mills or in at-risk states*	Certified laboratory	0.01 ppm
Iron	Water colored or leaving orange/red stains	Certified laboratory or field test using certified procedures	0.3 ppm
MTBE (methyl tertiary butyl ether)	Water has oil/gas smell or oily film in area where MTBE is used	Certified laboratory	20 ppb
Nitrate	Annually in farm areas; pregnant woman/infant in house	Certified laboratory or field test using certified procedures	10 ppm
Radium	Area with high radium in bedrock	Certified laboratory	5 picocuries per liter
Radon	Before buying/moving into new home	Certified laboratory	Check with state radon office
Sulfur & Manganese	Bitter taste; rotten egg odor; black/brown water or staining	Certified laboratory or field test using certified procedures	250 ppm for sulfur; 0.05 ppm for manganese
TCE (trichloroethylene)	Near factories/dry cleaners or in at-risk states**	Certified laboratory	5 ppb

* At-risk states for chromium: California, Connecticut, Delaware, Illinois, Indiana, Maryland, New York, New Jersey, Pennsylvania, Texas and Wisconsin

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

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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 include 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, but 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 that particular concentration. Compare the water test results with 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 your state health department or environmental agency, the local extension service or a water well professional.

Wells are viable, sustainable and cost-effective. Yearly testing is an important step in the maintenance of these safe drinking water systems. *wqp*

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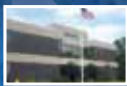
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