

# Individual Drinking Water Wells- Water Quality Monitoring & Treatment



FACT SHEET

SWP-111

## What is an Individual Drinking Water Well?

Individual drinking water wells are typically privately owned wells that provide drinking water to single family homes. They are found throughout Montana in suburban and rural settings. They may be located on each lot in a subdivision or on a large ranch in a sparsely populated area. Water quality from individual drinking water wells is not monitored by anyone other than the owner. State and county agencies often refer to federal Safe Drinking Water Act water quality standards when providing assistance to private well owners, but those standards are used as guidance and do not apply to private wells.

## Are There Contaminants in My Well Water?

When most people read or hear the word contaminant, it signals danger or disease. However, a contaminant is "any physical, chemical, biological, or radiological substance or matter in water." Whether water is safe to drink depends on the specific contaminants it contains, how much of each contaminant is present, and how these contaminants affect human health. Contaminants may be microbes, organic or inorganic chemicals, or radioactive materials. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Maximum contaminant levels or "MCLs" for public water supplies are set at very stringent levels by the federal Safe Drinking Water Act. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from microbial infections. These people or their caregivers should seek advice about drinking water from their health care providers.

# How Can I Make Sure That My Well Water Is Safe For Drinking?

Test your drinking water. At a minimum, your water should be tested every year for bacteria and nitrate, two commonly used water quality indicators. Other tests may be suggested depending on where you live and what is located near your drinking water supply. Table 1 describes some conditions that may prompt you to test for select contaminants. For example, if you have problems with taste, odor, staining or color of your water, then test levels of iron, manganese and sulfate. Testing more than once a year may be warranted in special situations:

- Someone in your household is pregnant or nursing
- There are unexplained illnesses in the family
- Your neighbors find a contaminant of concern in their water
- You note a change in water taste, odor, color or clarity
- There is a spill of chemicals or fuels into or near your well.

Testing can be expensive and is paid for by the homeowners so you need to have a general idea of what to test for. Contact your local health department for guidance in selecting tests.

Table 1: Tests for Specific Conditions

Conditions or Nearby Activities	Recommended Test
Recurrent gastrointestinal illness	Coliform bacteria
Household plumbing contains lead	pH, alkalinity, hardness, lead, copper
Radon present in indoor air	Radon (when indoor air remediation insufficient)
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, lead, copper, alkalinity
Rapid wear of water treatment equipment	pH, corrosion, alkalinity, hardness
Nearby areas of intensive agriculture	Nitrate, pesticides, coliform bacteria
Nearby Storm Water discharges	SVOCs, chloride
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, industrial operation nearby	VOCs, pH, sulfate, chloride, metals

## Should I Consider a Treatment System?

The answer depends on whether the contaminant poses a health threat at the reported level. Compare your water test results to the federal standards (<http://water.epa.gov/drink/contaminants>) to assess the potential for health problems. If in doubt, contact your local health department. It may be beneficial to follow up with a second test taken at a different time before you decide on any water treatment.

Drinking water filters and treatment units are referred to as *point-of-use* or *point-of-entry* devices. Point-of-use units (POU) treat water from a specific tap, while point-of-entry (POE) devices treat all the water that enters your home. For example, a POE device might be desirable if showering and bathing are possible routes of exposure to the contaminant. A POU unit would attach to the faucet, or fit under the sink and treat the water you use for drinking and cooking. Also, stand-alone models can be used on your kitchen counter to treat just the amount of water you want to use at any one time. Water treatment devices need to be chosen for the specific contaminants you want to eliminate. Some water treatment systems get rid of pesticides and industrial cleaners, while others are most effective at removing heavy metals. Refer to Table 2 for treatment recommendations for contaminants of concern.

**Table 2: Water Contaminants and Treatment Options**

<b>Contaminant</b>	<b>Recommended Treatment</b>
<b>Arsenic</b>	Point of Use: reverse osmosis, distillation or cartridge-type removal devices
<b>Bacteria</b>	Disinfection: chlorine, ultraviolet light or ozone treatments
<b>Chromium</b>	Point of Use: coagulation, ion exchange, reverse osmosis or lime softening
<b>Iron</b>	Multiple: shock chlorination, water heater modification, activated carbon filter, oxidizing filter or oxidizing chemical injection. Tests will determine best treatment.
<b>MTBE</b>	Contact your state health department or well professional.
<b>Nitrate</b>	Point of use: ion exchange, electro dialysis or reverse osmosis
<b>Radium, Uranium</b>	Point of use: ion exchange and reverse osmosis
<b>Radon</b>	Point of use: aeration devices or granular activated carbon (GAC) filters
<b>Sulfur &amp; Manganese</b>	Point of use: sulfur - distillation, reverse osmosis or ion exchange; manganese and hydrogen sulfide - shock chlorination, water heater modification, activated carbon filter, oxidizing filter or oxidizing chemical injection
<b>VOCs/sVOCs</b>	Point of use: Activated Carbon (AC)
<b>TCE (trichloroethylene)</b>	Point of use: packed tower aeration (GAC filter with reverse osmosis distillation)

If you find that your private well water contains unacceptable levels of contaminants and you are considering the purchase of a water treatment unit, be an informed consumer. You should research treatment devices based on your water quality needs and you should have an idea of the capabilities and cost range to expect (see Table 3). While most sellers of water treatment units are reputable, some take advantage of the public's fears about drinking water and are selling expensive devices that may be overdesigned or may not solve the specific water problem you want to treat. Also look for evidence that the treatment device has been tested and approved by an independent group such as the NSF

International (formerly National Sanitation Foundation). The NSF is a voluntary certification program for water treatment devices and bottled water. While the NSF does not recommend a particular brand of water treatment unit, they can provide you with useful information about the various water treatment units and technologies.

**Table 3: Household Water Cleanup Options and Estimated Costs**

Water Treatment System	Estimated Costs
<b>Activated carbon filtration</b>	
Faucet-mounted	\$25-50
Under the sink	\$50-300
Whole house	\$500-800
<b>Distillation</b>	Countertop \$300-350
<b>Ion exchange</b>	Whole house \$500-800
<b>Reverse osmosis</b>	Single tap \$200-600
<b>Bottled water</b>	\$10 to \$20 weekly for a family of four

**Additional Contacts: Where can you get help?**

- County Environmental Health Department or Sanitarian's Office under *County Government* listings in the phone book.
- Montana DEQ Source Water Protection Program. (406) 444-4806
- Montana State University Extension Water Quality Program. (406) 994-6589

**References:**

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