

PRIVATE DRINKING WATER SYSTEMS

Overview

This pamphlet outlines how to construct and operate a rural water supply. Every case is a little different and must be handled according to its particular conditions.

Drinking Water System Guidelines For Private Homes

Is your water safe to drink? Contaminated water is often responsible for people suffering from diarrhea, typhoid fever and other diseases spread through the water.

Poisons such as arsenic and nitrates are sometimes found in local ground water. Most of these problems can be overcome by the proper development and treatment of your water system.

A public water system serves water to more than three homes or to a business. Public water systems must be identified and inspected by the Oregon State Health Division.

Domestic water comes from one of two sources: ground water or surface water.

Ground Water

Ground water is found beneath the surface of the earth. It is usually the safest source to develop for your use.

If you drill a well, you must record a well log with the County Water Master (541) 440-4255. The well log shows the type and depth of soil and rock drilled through and the exact location of the well on your property.

Wells should be located at least 100 feet away from septic systems, fuel tanks and other sources of contamination. This should be considered when planning to drill a well on property already developed.

You should be able to receive a copy of your existing well log from the County Water Master's office if one is on file.

Surface Water

Surface water flows on or near the ground surface. Surface water sources can be changed by rainfall. Shallow wells, ponds, rivers and springs are examples of surface water.

Surface water needs to be filtered and treated with chemicals. In order to use surface water, you may need water rights for your source.

For rights to the water, you must contact the County Water Master's office, telephone (541) 440-4255.

Without water rights, you may be directed to immediately stop using the water.

Know What You're Drinking

The most important thing to know about your drinking water is whether or not it is safe. It is recommended that your water be tested at least once for inorganic chemicals and yearly for bacterial contamination.

A variety of tests are available which screen for chemical contaminants. If some chemical, mineral, or other contaminant is found, you may require help to correct the problem. Many forms of contamination can be corrected with the proper treatment process. The chemical contaminants found in water tend to change slowly with time and may require intensive treatment.

Coliform bacteria are indicators of water quality. While they may not be harmful themselves, Coliform bacteria generally indicate surface contamination. If Coliform bacteria are detected, the water may include gastro-enteric pathogens (disease causing organisms found in fecal waste). Coliform bacteria contamination may be corrected with the proper treatment.

Wells

Drilled wells are not without problems. The well water may contain calcium, iron, sulfur or arsenic. Some of these minerals may affect taste or smell of the water. Arsenic is a deadly poison and makes the water unsafe to drink.

Other factors which may affect water quality include pesticides, herbicides or other contaminants. It is important that you have your water tested for inorganic chemicals at least once because many contaminants do not have an obvious taste or smell.

When you develop a new well or re-develop an existing well, it should meet the following standards:

1. The well casing should be extended above the ground by at least 12 inches, not located in a pit.
2. The well casing should be properly capped with a sanitary seal which has been designed for the type and size of pump being used.
3. The sanitary seal should have an inverted vent which has a screen to prevent flood water, insects and small animals from entering the well.
4. Each pump and the tank it feeds should have a valve to relieve excess pressure and a gauge to measure the pressure.
5. There should not be any other pipes that connect water that is unsafe with drinking water pipes. Unsafe water includes irrigation water and water running from a toilet or sewer line.
6. Wells should be located at least 50 feet from septic tanks, 100 feet from septic drain fields or other sources of contamination such as fuel tanks, confined animals, etc.

Springs

Springs are often used as a source of drinking water. If they are not developed properly, they can produce water which is not safe to drink.

The spring must be covered and you must be able to clean it.

A section of concrete culvert can be the base for developing a spring box. Pour concrete into culvert to seal the bottom. This bottom should be sloped (angled down from the sides of the culvert).

1. You should install three different pipe levels.
2. The first line is for overflow to drain off extra water. This line needs to enter the spring box near the top.
3. The second line leads from the spring to the house. This line is put in between the drain and the overflow. This line needs an elbow inside the spring box turned so the opening faces the bottom of the box. You can screen the elbow to help keep floating material from entering the line to your house.
4. The third is a drain line. This is put in at the lowest point of the spring box. This line is needed to drain and allow cleaning of the spring box.

5. When completed, cover the spring site with heavy plastic. If the spring is on a slope, you can ditch the uphill area around the spring to prevent runoff flowing into your spring box.
6. A tight fitting lid that prevents surface water and rodents from entering the spring box is necessary to protect the water.

It is a good idea to fence the spring box to keep animals from entering or contaminating it.

Reservoir Tank

A reservoir tank can be placed between the spring box or well and the house. A reservoir is used to store water and may make a low producing well or spring useable as a drinking water source. The reservoir is set up like the spring box with an overflow line and a bottom drain. Periodic cleaning of the reservoir is required because during water storage, very fine dirt will settle to the bottom.

Reservoirs should be made of material that can be cleaned, such as plastic, fiberglass or concrete.

Disinfecting a Water System

Chlorine is a chemical used to destroy harmful bacteria that contaminate water. To be sure that a water system is clear of bacteria, super chlorination is performed. Super chlorination should be done whenever there is bacterial contamination, whenever a new well or spring is developed, or whenever the water system is repaired.

To Super Chlorinate a **Spring**:

1. Figure about how many gallons are in your water system (spring box + reservoir + pipes).
2. For every 120 gallons of water in the system add one pint of household bleach.
3. Add the bleach to the spring box, open all of the house faucets until you smell chlorine, then let stand a few hours or overnight. Then open all of the faucets until you can no longer smell chlorine.

To Super Chlorinate a **Well**:

1. To super chlorinate a well, the amount of bleach is still determined by the amount of water.

2. To figure the amount of water in the well you must first measure the amount of water in your well. (Consult the table below to assist you).

DIAMETER IN INCHES	4	6	8	12	24	36	48	60	72
GALLONS PER FOOT	.65	1.5	2.6	6	24	53	94	147	213

3 . Multiply the depth of water by the diameter of your well. See the example below:

WELL CASING: 6 inches

DEPTH OF WATER: 80 Feet

$80 \times 1.5 = 120$ Gallons

4. You may also apply the figures to storage tanks. A tank 10 feet long and 3 feet in diameter holds 530 gallons of water.

($53 \times 10 = 530$).

5. Pour the chlorine into the well. After mixing, turn on each faucet in your house until you smell chlorine.

6. Let the system set for several hours or overnight. Pump the well onto the ground until you no longer smell chlorine.

7. After a week of normal use, take another sample of the water to be tested for bacteria (Coliform).

8. If, after super chlorination, the well water is still contaminated, it may be necessary to install automatic disinfecting equipment, such as a chlorinator or ultra violet light.

Emergency Home Water Treatment

In the event of a water emergency, if you need small amounts of water, there are several ways to make it safe. Two ways are explained below: boiling and adding a disinfectant (chlorine, iodine).

Boiling

The safest and simplest way to treat your water is to boil it. Bring the water to a full boil for at least one minute. Then allow the water to cool.

If the water tastes flat pour it back and forth between containers. This will allow air to be absorbed and should improve the taste. An electric mixer can also be used.

Chlorine

Household bleach contains chlorine (5.25%). For each gallon of water add 8 drops of bleach. If the water is muddy add 15 to 20 drops of bleach. Stir well and allow to stand for 30 minutes. The water should have a slight chlorine taste. If not, add one or two more drops of bleach.

Iodine

You can use ordinary iodine (92% iodine or 2.4% sodium iodine) to treat water. For each gallon of water add 8 drops. If the water is muddy or has moss in it use 15 to 25 drops of iodine. Stir the water well and let stand for 30 minutes. The water should have a slight medicine taste to it. If not, add more iodine a few drops at a time. Follow directions on label for Halazone Tablets.

Testing

Testing water for chemicals can be done by a private laboratory. The two tests required for real estate sales are Nitrate and total Coliform tests. Coliform is a bacteria that may be found in contaminated water.

To determine the type of test you want or need, you should contact the laboratory directly. Laboratories can be found listed in the Yellow Pages under Laboratories-Analytical.

Problem Solving

If you think your well is contaminated, try to find the source of the problem by asking the following questions.

Is the contamination getting in through the top of the well?

Is there a well seal (bentonite or cement grout) around the well casing?

Is the well at least 100 feet from the septic drain field?

Is the well at least 100 feet from livestock or pets?

Is there a source of contaminants uphill from the well?

Is the top of the well capped or sealed to prevent dirt and insects from entering?

Do you have a well or spring house? Are chemicals like paints, oil, or pesticides stored there? Is the well house clean and free of bugs and rodent droppings?