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FAQs: Disinfecting Water Wells and Storage Tanks

Note: Read the entire document before proceeding with disinfection.

Caution: Do not drink the water used in the disinfection process, or use it for other domestic needs because of the high chlorine concentration in the water. Normal use can resume after the system is purged of chlorine and tests show no contamination.

When should I disinfect my water well and storage tank?

Water well and storage tank disinfection should be performed under the following circumstances:

- A positive total coliform or *E. coli* test
- After flooding or other well contamination, such as a cracked well cap
- After casing or pump repairs
- When drinking water taste or odor changes
- During new well or seasonal well start up

Note: If you suspect that your public drinking water well or storage tank may be contaminated, contact the appropriate Idaho Department of Environmental Quality (DEQ) regional office or local health district for specific advice. If you are unsure about the extent or kind of contamination, you may need to secure an alternative drinking water supply such as bottled water until your well water is determined to be safe for consumption. *Caution:* Infants and pregnant women should use bottled water only for drinking and cooking during the disinfection process.

Personnel at regulated public water systems need to follow the public notification procedures discussed in the United States Environmental Protection Agency's (EPA's) *Revised Public Notification Handbook* if your system has become contaminated. The handbook and public notification templates can be accessed through the following hyperlink. Templates can be viewed starting on page 35.

<http://water.epa.gov/lawsregs/rulesregs/sdwa/publicnotification/upload/PNrevisedPNHandbookMarch2010.pdf>

Disinfecting a well can sometimes be done by the well owner, but with some wells, it can be difficult to properly introduce the disinfectant into the well or other parts of the system that need disinfecting. *DEQ recommends hiring a professional such as a licensed plumber, licensed water system operator, pump installer, or licensed well driller to disinfect your well.* If a professional is not available, carefully follow the steps below after discussing the procedure with the DEQ regional office or local health district.

How do I disinfect a drinking water well?

1. **Prepare.** Gather treatment supplies including (a) clean food-grade water hoses, (b) a clean food-grade, 5-gallon mixing bucket, (c) a clean container for the sanitary well cap, and (d) a funnel.¹

Before treatment, inform everyone who may use the water that it is being treated and should not be used. Provide an alternative drinking water supply for the house or water system, such as bottled water.

If a storage tank (other than a pressure tank) is on the system, see “How do I disinfect a storage tank?” below. It is recommended that water well and storage tank systems are disinfected at the same time.

2. **Calculate the required chlorine dose using Table 1.** To properly disinfect a drilled well, use nonscented household laundry bleach, 5.25% chlorine, that is National Sanitation Foundation (NSF)-approved.

Table 1. Chlorine dose calculation chart (100 parts per million chlorine concentration).

Water Depth in Well (feet) ^a	Required Chlorine Dose		
	6-inch Well Diameter	8-inch Well Diameter	10-inch Well Diameter
10	1 cup	1 cup	2 cups
20	1 cup	2 cups	1 quart
30	2 cups	1 quart	1-1/2 quarts
40	2 cups	1 quart	2 quarts
60	3 cups	1-1/2 quarts	3 quarts
80	1 quart	2 quarts	3-1/2 quarts
100	1-1/2 quarts	2-1/2 quarts	1 gallon
150	2-1/2 quarts	1 gallon	1-1/2 gallons

a. When it is inconvenient to determine the well depth or water depth, a minimum of one-half gallon of NSF-approved household bleach may be used for wells up to 8 inches in diameter with water estimated to be less than 80 feet deep. Use 1 gallon for similar sized wells with water deeper than 80 feet. In the case of a well yielding more than 50 gallons per minute, special procedures are required. Seek the advice of the local health district or DEQ regional office.

Caution: Never use a lead weight such as a fishing sinker on a line to determine well depth. It could potentially contaminate the well if dropped down the well casing and not recovered.

3. **Remove the sanitary well cap.** If the well has a sanitary well cap, unbolt and remove the cap from the top of the well casing to access the well. Clean the cap to remove debris, dirt, oil, and grease. Place the cap in a clean container and cover it with chlorine solution. If the well is fitted with a sanitary well seal, remove the threaded plug from the top of the seal.

¹ Food-grade means drinking water-rated, such as a recreational vehicle (RV) water-supply hose.

- 4. Introduce the chlorine.** Place a funnel in the hole to introduce the chlorine solution into the well if the well has a sanitary seal. Using a food-grade bucket filled with 3 to 4 gallons of clean water, mix the correct amount (Table 1) of nonscented, NSF-approved chlorine and pour the chlorine mixture into the casing or into the funnel so it runs down the inside of the well casing.

Caution: Do not drink the water or use it for other domestic needs after introducing the chlorine to the well and storage tank because of the high chlorine concentration. Normal use can resume after the system is flushed (Step 6) and tests show no contamination.

- 5. Recirculate the chlorine.** To recirculate the chlorine in the well, attach a clean food-grade hose to a faucet and recirculate the water back into the top of the well casing by turning on the tap and letting the water run for approximately 15 minutes. If possible, spray the sides of the well casing during this process. At this time, the chlorine odor must be detected in the water. If chlorine odor is not detected, continue the recirculating procedure until the chlorine odor is detected.

To recirculate the chlorine solution when the well is fitted with a sanitary well seal, a piece of tubing may need to be fitted to the end of the hose so that it can be inserted into the hole in the well seal. The tubing should be made of food-grade materials.

- 6. Distribute the chlorine.** After recirculating the chlorine, open all water taps, both inside and outside, and let the water run until the chlorine odor is detected in each tap. Turn the taps off. Let the chlorinated water stand in the system for 12 to 24 hours before flushing the chlorine from the system.

Caution: If the system uses a bladder pressure tank that does not have a flow-through design, special precautions are needed to ensure proper tank disinfection. After chlorine is mixed in the well and the well pump is off, open the first or closest tap until chlorine odor is detected, and the well pump starts running again. Turn off the tap, and wait until the well pump stops. The chlorine solution should then be in the bladder tank. Proceed with opening and closing the other taps as described above.

- 7. Flush the system.** To purge the chlorine from the system, open all the outside taps first, and let the water run until no chlorine odor is detected. Flush water onto a gravel drive or road. *Do not drain the chlorinated water directly into surface water or on vegetation.* Next, open the inside taps until the chlorine is gone. *Do not pump the highly chlorinated water into a septic system.*
- 8. Retest the system.** To determine if the water is safe to use, a bacteriological water sample should be collected several days after the chlorine is completely flushed from the system. To ensure that all the chlorine has been flushed from the system, measure the chlorine residual in the water using a chlorine test kit that uses the DPD (N,N-diethyl-p-phenylenediamine) method, which measures down to

0.1 parts per million (ppm) total chlorine. Repeat disinfection if the water sample indicates the continued presence of coliform organisms. Collect the bacteriological water sample only if the chlorine residual is below detection. If the chlorine residual is detected, then reflush the system following Step 7. Water must be retested after each disinfection.

9. **Contamination still present.** If continued disinfection does not clear up the contamination, contact the local health district or DEQ regional office for professional advice.

Caution: Until sampling shows no contamination in your well, continue using bottled water or water that has been boiled at a rolling boil for 1 minute. Note that boiling water concentrates nitrate levels and other contaminants in water, so infants and pregnant women should use bottled water instead of boiled tap water for drinking and cooking.

How do I disinfect a storage tank?

To disinfect a storage tank or other large volume of water, thoroughly mix non-scented NSF-approved household bleach (5.25% chlorine) in the reservoir at the ratio of 1 gallon of bleach for every 1,000 gallons of water (i.e., 1 quart for every 250 gallons of water). This will give a chlorine concentration of 50 ppm.

Add bleach directly to the storage tank at the same time you are disinfecting the well. Let the storage tank drain into the distribution system. After sitting 12 to 24 hours, drain the storage tank through a drain valve or through the distribution system. *Do not dispose of chlorinated water on vegetation or into surface water.*