

WELL WATER DISINFECTION



SAFETY PRECAUTIONS

- Clear hazards away from wells before cleaning and disinfecting them. Follow these precautions:
- Turn off all electricity to the well area before clearing debris. Do not attempt to repair the water system unless you are experienced with this type of work: electrical shock can occur. Inspect all electric connections for breaks in insulation and for moisture. Connections must be dry and unbroken to avoid electric shock.
- Carefully inspect the area around the well for hazards such as power lines on the ground or in the water; sharp metal, glass, or wood debris; open holes; and slippery conditions.
- Do not enter the well pit. Gases and vapors can build up in well pits, creating a hazardous environment. Clear debris from dug wells using buckets, grappling hooks, nets, and long-handled scoops.
- Before the power is turned back on for the well, a qualified electrician, well contractor, or pump contractor should check the equipment wiring system.
- Wear protective goggles or a face shield when working with chlorine solutions. Chlorine solutions may cause injury to the eye, irritate skin and damage clothing.
- Work in well-ventilated areas and avoid breathing vapors when mixing and handling chlorine solutions.
- Warn users not to drink or bathe in water until all the well has been disinfected.

SAMPLING AFTER DISINFECTION

- Wait at least 7 to 10 days to test the water after disinfection to ensure that the chlorine has been thoroughly flushed from the system. Until well water has been tested, boil it (rolling boil for 1 minute) before using or use another alternative water source.
- Contact your local health department for water sampling and testing information. You can also get water sampling information from the U.S. Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).
- Sample the water for total coliform and either E. coli or fecal coliform bacteria to confirm that the water is safe to drink.
- If results show no presence of total coliforms or fecal coliforms, the water can be considered safe to drink.
- Follow up with two more water tests, one in the next 2 to 4 weeks and another in 3 to 4 months.
- Check the safety of your water over the long term: continue to monitor bacterial quality at least twice per year or more often if you suspect any changes in your water quality.

If results show the presence of any coliform bacteria, repeat the well disinfection process and test again.

DISINFECTION ISSUES AND CONCERNS

The disinfection process may damage water softeners due to the large amounts of chlorine used. Follow your manufacturers' instructions for appropriate methods to disinfect your softener unit. You will need to bypass the unit until completing the disinfection process.



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DISINFECTION OF BORED OR DUG WELLS

Bored and dug wells can be difficult to disinfect because the shallow depth and inadequate protection from flood water can allow contaminants to re-enter the well.

IMPORTANT: Bored or dug wells contaminated with fuel or toxic chemicals will not be made safe by disinfection. If your water smells like fuel or has a chemical odor, contact your local, state, or tribal health department for specific advice.

Follow these steps to disinfect bored or dug wells:

1. If the well has an electrical pump, turn off all electricity and clear debris from around the top of the well.
2. Repair the electrical system and pump if needed. Contact a qualified electrician, well contractor, or pump contractor if you are not experienced with this type of work.
3. Start the pump and run water until it is clear. Use the outside faucet closest to the well to drain potentially contaminated water from the well and keep unsafe well water out of the interior household plumbing. If there isn't a pump, bail water from the well with a bucket until water is clear.
4. If the well is connected to interior home plumbing, close valves to any water softener unit.
5. Use [Table 1](#) to determine the amount of liquid household bleach needed to disinfect the well. Use only unscented bleach.
6. Using a 5-gallon bucket, mix the bleach from Table 1 with 3-5 gallons of water (12-19 liters).
7. Remove the vent cap.
8. Pour the bleach water mixture into the well using a funnel. Avoid all electrical connections. Attach a clean hose to the nearest outside faucet and use it to circulate water back into the well for thorough mixing.
9. Rinse the inside of the well casing with a garden hose or bucket for 5-10 minutes.
10. Open all faucets inside the home and run the water until you notice a strong odor of chlorine (bleach) at each faucet. Turn off all faucets and allow the solution to remain in the well and plumbing for a minimum of 12 hours.
11. After at least 12 hours, attach a hose to an outside faucet and drain the chlorinated water onto an area without plants or other vegetation, such as a driveway. Continue draining until the chlorine odor disappears. Avoid draining into open sources of water (streams, ponds, etc.).
12. Turn on all indoor faucets and run water until the chlorine odor disappears.
13. Until well water has been tested, boil it (rolling boil for 1 minute) before using or use another alternative water source. Wait at least 7-10 days after disinfection, then have the water in your well sampled. Water sampling cannot be done until all traces of chlorine have been flushed from the system.

Table 1. Approximate Amount of Bleach for Disinfection of a Bored or Dug Well

Depth of Water	Diameter of Well					
	0.5 foot	1 foot	2 feet	3 feet	4 feet	5 feet
10 feet	1/2 cup	1-3/4 cups	7 cups	1 gal	1-3/4 gal	2-3/4 gal
20 feet	1 cup	3-1/2 cups	14 cups	2 gal	3-1/2 gal	5-1/2 gal
30 feet	1-1/2 cups	5-1/4 cups	1-1/4 gal	3 gal	5-1/4 gal	8-1/4 gal
40 feet	2 cups	7 cups	1-3/4 gal	4 gal	7 gal	11 gal
50 feet	2-1/2 cups	8-3/4 cups	2-1/4 gal	5 gal	8-3/4 gal	13-3/4 gal

TABLE NOTES:

- Use only unscented household liquid chlorine bleach.
- Bleach concentrations are generally between 5%-9%.
- Quantities given in this table are approximate and are rounded to the nearest practical measurement. Amounts given are calculated in accordance with reaching a chlorine concentration of > 100 mg/L



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DISINFECTION OF DRILLED OR DRIVEN WELLS

Follow these steps:

1. If the well is equipped with an electrical pump, turn off all electricity and clear debris from around the top of the well.
2. Repair the electrical system and pump if needed. Contact a qualified electrician, well contractor, or pump contractor if you are not experienced with this type of work.
3. Start the pump and run water until it is clear. Use the outside faucet closest to the well to drain potentially contaminated water from the well and keep unsafe well water out of the interior household plumbing. If there isn't a pump, bail water from the well with a bucket or other device until the water is clear.
4. If the well is connected to interior home plumbing, close valves to any water softener units.
5. Use [Table 2](#) to determine the amount of liquid household bleach needed to disinfect the well. Use only unscented bleach.
6. Using a 5-gallon bucket, mix the bleach from Table 1 with 3-5 gallons of water (12-19 liters).
7. Remove the vent cap.
8. Pour the bleach water mixture into the well using a funnel. Avoid all electrical connections. Attach a clean hose to the nearest outside faucet and use it to circulate water back into the well for thorough mixing.
9. Rinse the inside of the well casing with a garden hose or bucket for 5-10 minutes.
10. Open all faucets inside the home and run the water until you notice a strong odor of chlorine (bleach) at each faucet. Turn off all faucets and allow the solution to remain in the well and plumbing for a minimum of 12 hours.
11. After at least 12 hours, attach a hose to an outside faucet and drain the chlorinated water onto an area without plants or other vegetation, such as a driveway. Continue draining until the chlorine odor disappears. Avoid draining into open sources of water (streams, ponds, etc.).
12. Turn on all indoor faucets and run water until the chlorine odor disappears.
13. Until well water has been tested, boil it (rolling boil for 1 minute) before using or use another alternative water source. Wait at least 7-10 days after disinfection, then have the water in your well sampled. Water sampling cannot be done until all traces of chlorine have been flushed from the system.

Table 2. Approximate Amount of Bleach for Disinfection of a Drilled or Driven Well

Depth of Water	Diameter of Well Casing						
	2 inches	4 inches	6 inches	8 inches	10 inches	24 inches	36 inches
10 feet	3/4 tbsp	3-1/4 tbsp	1/2 cup	3/4 cup	1-1/4 cups	7 cups	1 gal
20 feet	1-1/2 tbsp	6-1/2 tbsp	1 cup	1-1/2 cups	2-1/2 cups	14 cups	2 gal
30 feet	2-1/4 tbsp	9-3/4 tbsp	1-1/2 cups	2-1/4 cups	3-3/4 cups	1-1/4 gal	3 gal
40 feet	3 tbsp	13 tbsp	2 cups	3 cups	5 cups	1-3/4 gal	4 gal
50 feet	3-3/4 tbsp	1 cup	2-1/2 cups	3-3/4 cups	6-1/4 cups	2-1/4 gal	5 gal
100 feet	7-1/2 tbsp	2 cups	5 cups	7-1/2 cups	12-1/2 cups	4-1/2 gal	10 gal

TABLE NOTES:

- Use only unscented household liquid chlorine bleach.
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