

“Do It Yourself”

Private Well Disinfection Procedures

It is important to remember that well disinfection is **not** intended to be used on a regular basis. If you need to disinfect your well on a frequent basis, it could be an indicator that there are more serious problems that should not be ignored. Also, frequent chlorination can corrode metal well components, including the well casing itself.

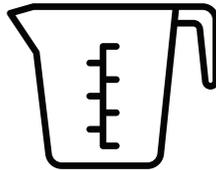
New wells and wells infected with bacteria should be disinfected according to the following instructions.

Materials needed:

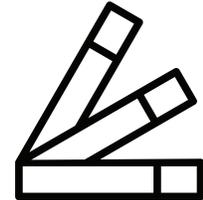
- Three new 33-gallon trash cans



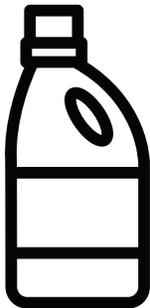
- 1-cup measuring cup



- pH test strips or digital pH wand



- 1 new bottle of laundry bleach 5.25% strength (without additives)



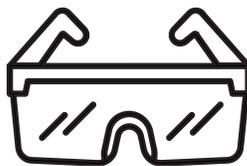
- 1 section of new garden hose of sufficient length to siphon from cans into the well



- Latex or vinyl gloves



- Safety glasses

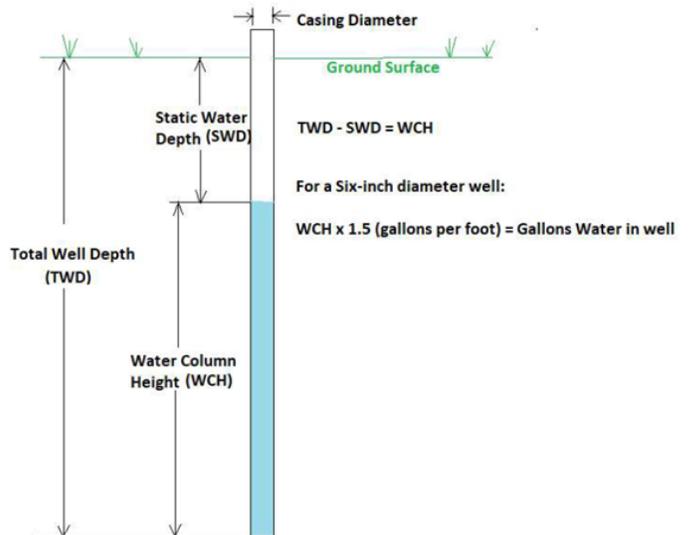
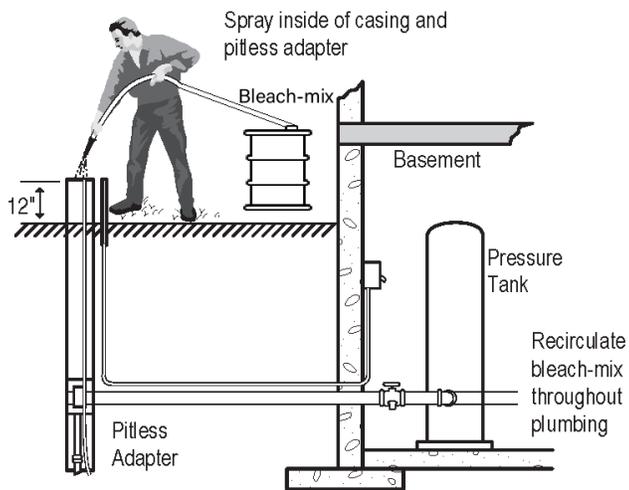


1. Close gate valves so the chlorine solution will bypass your water softener and any other water treatment equipment. A strong chlorine solution can damage this equipment. You can disinfect these devices separately using the manufacturer's instructions.
2. For wells up to a 70-foot water column, mix a 100-gallon bleach solution in a clean container. Common practice is to use three new 33-gallon trash cans, mixing 1 cup of common laundry bleach (5.25% strength) per trash can full of water. Measure and note the pH of the mix. The pH should not exceed 7.5.

See notes for Arsenic areas and/or more concentrated solutions.

3. Turn off the electrical power and, while wearing eye protection, rubber gloves and rubber-soled shoes, remove the well cap. **Caution: Do not use granular or tablet chlorine products in the arsenic problem areas of northeastern Wisconsin.**
4. Pay attention to any sign of vermin infestation after opening the cap. If there are any spiderwebs, bugs or rodent droppings, no amount of disinfection will help until the system breach is fixed. Make sure you examine pump wires for chafed insulation or missing wire nuts. Make any necessary repairs to the electrical system.
5. Pour or siphon the chlorine solution down the well, as rapidly as possible, in one continuous pour. Make sure you rinse the entire inside surface of the casing, all the way down to the water table.

6. Turn the electrical power back on. Open every water faucet throughout your plumbing system, both inside and outside, until you can smell the chlorine solution at each one. If you have a cartridge water filter system, replace the cartridge after you have completed the chlorination process and completely flushed the system. **Note: Dead-end pipes may need to be removed since chlorine cannot disinfect these areas.**
7. Turn all water taps off completely and allow the chlorine solution to remain in your well and plumbing system at least overnight, but preferably for 24 hours.
8. Flush the chlorine solution from the entire water system by using a hose connected to one of your outside faucets. Run the solution to a location away from your lawn and landscaping because it can damage them. Also, make sure the chlorine solution does not get into a stream, river or lake. Chlorine, even in small doses, can kill aquatic life. Do not run the chlorinated solution into your septic system because it may kill the bacteria that biologically break down the waste. The extra volume of the solution can also hydraulically overload the system. The flushing process can take a long time. Keep running the water until you no longer notice a smell of chlorine from any of your faucets or taps.
9. After the chlorine solution has been completely flushed from the system, wait about a week and resample your water for Total Coliform/E. coli to make sure it is coliform/E. coli negative.



Notes:

Check the strength of the chlorine solution/bleach! Bleach purchased in the swimming pool section of department stores is often double the strength of laundry bleach. Read the labels and adjust the concentrations accordingly.

If 100 ppm bleach solution is not effective, a stronger solution may help. For stronger bleach solutions, the following may be used as a guide, assuming you are using 5.25% laundry bleach:

Volume of Bleach To Water Mix Ratio	Approximate Chlorine Concentration
¾ quart bleach per 100 gallons water	100 ppm
1½ quarts bleach per 100 gallons water	200 ppm
2 quarts bleach per 100 gallons water	300 ppm

For 6-inch wells with greater than a 70-foot water column or wells with different diameters, calculate the volume of water in the water column and prepare a bleach solution that equals that volume.

You can determine the volume of water standing in your well by first searching for a [well construction report](#), then subtracting the depth to the water in the well (static water level) from the total depth of the well. This will give you the height of the standing water column in the well. Then multiply this calculated height of water column by one of the following “volume factors,” based on the diameter of your well. Each foot of standing water in the well will contain about:

- 8-inch diameter well: 2 ½ gallons
- 6-inch diameter well: 1 ½ gallons
- 5-inch diameter well: 1 gallon
- 4-inch diameter well: 2/3 gallon
- 2-inch diameter well: ¾ quart

Note: If the total volume of water in the well is not known, 100 gallons is, for most cases, a reasonably good estimate. Most trash cans hold about 30 gallons, so filling three new plastic trash cans may be sufficient.

Disinfection in arsenic areas. If a 100-ppm solution is not effective, contact the department if you are in a known arsenic area, but do NOT exceed 100 ppm in arsenic [areas](#).

Increasing Water Heater Temperature For Sulfur-Reducing Bacteria

Rotten egg odor is more common from a hot water tap than from a cold water tap because the hydrogen sulfide gas remains dissolved in cold water. As the temperature increases, the gas is released as the hot water exits the tap.

Since sulfur-reducing bacteria are killed at temperatures above 140°F, 60°C (which is the medium setting on most home water heaters), you can increase the temperature of a water heater to a setting of 160°F or 71 °C for 8 hours and then drain the tank to temporarily reduce the odor problem. The water tank must have a pressure relief valve or this treatment can be dangerous. Also, remember to warn users and reduce the setting afterwards to prevent accidental scalding.

Water heaters usually contain a sacrificial magnesium anode rod that helps protect the tank by corroding more easily than the tank lining. As it corrodes, the magnesium rod gives off electrons that can nourish sulfur-reducing bacteria. Removing this rod can reduce the bacteria problem, but doing so can shorten the tank life, especially when the water is softened. Replacing a magnesium rod with a zinc rod will not totally eliminate sulfur-reducing bacteria, but it can greatly reduce them.

pH And Disinfection

When used as a biocide, chlorine is most effective at a pH below 6. However, chlorine products can raise the pH of the water, especially in hard water, to a level where the chlorine solution becomes ineffective as a biocide (pH>8). To counteract this effect, the pH may need to be adjusted with a department-approved acid product. If pH must be controlled, the DNR recommends you hire a licensed professional to perform the shock chlorination. The addition of pH controls can cause toxic fumes to be released.

Other Disinfection Tools

In some instances, bacteria can form a thick slime layer. The use of sodium chloride salt and a chimney brush may help dislodge these layers, allowing them to be killed by the bleach.

Things To Consider

There can often be zones in the water column of the well that have no flow even when the pump is on. These zones can be difficult to disinfect and will harbor bacteria that will re-populate. This is especially common when the pump is not at or near the bottom of the well. Knowing the total well depth and the depth the pump is hung can be useful information.

The DNR recommends that you contact a licensed well professional to decontaminate or chlorinate your well. The knowledge and experience of a professional can go a long way and save you money and time. If you do not feel confident you can safely undertake this procedure, please reach out to a Licensed Well Driller or Pump Installer for guidance and assistance.

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