

Simple Disinfection of Domestic Water Well Using Chlorine

This method is a disinfection treatment to be used when a drinking water system is contaminated with bacteria. Contamination can occur when the well is installed, when repairs are made to the system, or if well is damaged. Please make note of the following:

- Consideration should be given to the well construction, type of pump and pitless adapter, corrosion of internal pump parts, potential for electric shock, and exposure to fumes.
- During disinfection process, water from the system is not suitable for consumption—plan to perform the disinfection process when faucets and toilets will not be in use for 12-24 hours.
- Water treatment equipment should also be disinfected—however, some equipment should be temporarily disconnected or by-passed during chlorination. Check owner’s manuals or manufacturers’ literature before disinfection to avoid damage to components.
- Use liquid household bleach containing 5.25% chlorine for disinfection. Do not use bleach with added fragrance or other cleaners added.

Steps for Simple Disinfection:

1. **Remove turbidity.** If the well water is not clear, pump it to waste until it clears up before starting the chlorine treatment. Turbidity (cloudiness) in the water can reduce the effectiveness of the chlorine.
2. **Bypass cartridge filters.** If the water system has a cartridge filter, place its valve in the “bypass” position and remove the cartridge housing and cartridge. Discard the old cartridge. Rinse the housing with a solution of 1 tablespoon of bleach and a cup of water. Drain the housing and insert a new filter cartridge. Reinstall the cartridge housing and filter, but leave the cartridge filter valve on “bypass” until the chlorine has been completely flushed from the water supply after the treatment with chlorine.
3. **Bypass other water treatment units.** Bypass all other treatment units, such as water softeners, reverse osmosis (RO) systems, and iron removal systems. Following manufacturer’s recommendations, disinfect the treatment units with chlorine. Then leave the units in “bypass” until all chlorine has been flushed from the water supply. High concentrations of chlorine can damage softener resin, RO membranes, etc.
4. **Check water well record.** Check the water well record to see if there are packers or other devices that will prevent the chlorine from reaching the water. If there are, or if you are unsure, contact a Michigan licensed water well drilling contractor to perform the treatment.
5. **Turn off the power to the well and remove the well cap.**
6. **Prepare a chlorine solution.** Prepare a chlorine solution using the table below. Any brand of **unscented** liquid household bleach that contains 5.25% sodium hypochlorite. **Swimming pool chlorine should be avoided.**

Chlorine Solution Table

Well Diameter	Amount of Bleach per 25 feet of well depth
4 inch	1 cup
5 inch	1 ½ cups
6 inch	2 cups

**Example: A 4-inch diameter well 50 feet deep would need 2 cups of bleach to treat the well.

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7. **Mix.** Mix the bleach (from the above chart) with 5 gallons of clean water in a clean plastic or glass container, and add an additional 2 cups of bleach (to assure sufficient chlorine for disinfection of the pressure tank, water heater, and distribution system).
**Example: From the chart above, a 4-inch diameter well 50 feet deep would need 2 cups of bleach to treat the well. Therefore, a total of 4 cups of bleach will be mixed with the 5 gallons of water.
8. **Pour.** Slowly pour the mixture into the top of the well.
9. **Circulate.** After the chlorine solution has been applied to the well, turn the pump on and circulate the chlorinated water through the service lines and plumbing (if present). Use a hose attached to an outside tap to run the water to waste (discharge onto the ground surface) until a chlorine smell can be detected in the water, and the water is clear (i.e., there is no turbidity). Do not discharge this water into a sewage disposal system.
10. **Recirculate.** Do not start this process until the water from the hose is clear. Use the garden hose (still attached to the outside tap) to recirculate the chlorinated water back into the top of the well and wash down the inside of the casing for at least 30 minutes (the longer the better). During this process, water circulates from the pump, through the drop pipe, service line, pressure tank, distribution piping, and hose back into the top of the well. This recirculation of chlorinated water will help assure a uniform distribution of the chlorine between the top of the water column in the well and the pump intake. In addition, all well surfaces above the water level in the well are completely flushed with chlorinated water. The recirculation of chlorinated water enhances the chlorination process by not only exposing surfaces to chlorinated water, but also to the cleaning effect of agitate (flowing) water.
11. **Reinstall the well cap.** After the recirculation period, turn off the water to the hose and cap the well.
12. **Open taps.** Open each tap within the home, one at a time, starting closest to the pressure tank, and run water until a strong chlorine smell is present. Close the tap. Do not forget to flush each hot water tap.
13. **Contact period.** Allow the chlorine to remain in the water supply for 4 to 12 hours, preferably overnight. Contact time is an important part of the chlorine treatment process. The longer the chlorine is allowed to remain in the water supply system, the better the chance that the chlorine will contact and kill microorganisms that may be present. Water used during the contact time should be minimized to assure that chlorine residual remains in the well.
14. **Flush.** After the contact period, pump to waste (flush) to remove the chlorine from the water supply. Flush until the chlorine smell can no longer be detected. After the chlorine smell can no longer be detected, it's recommended that flushing be continued for an additional 1 to 2 hours, since there may still be traces of chlorine in the well. This will help assure **all** traces of chlorine have been removed from the system. Flushing the well for an extended period of time after treatment with chlorine will also help clean the system because of the scouring action of the water as it flows through the pipes.

For this period of pumping to waste, use a hose connected to an outside tap, discharging into the yard, a roadside ditch, etc. If possible, avoid pumping chlorinated water on lawns and landscape

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plants. The outside tap should be allowed to run in the fully opened position to maximize the pumping rate.

- Do not run the water into the household plumbing, and subsequently into the septic tank/drainfield, during this pumping period. This will overload the drainfield and can damage your system.
- Do not run the water into a lake, stream, or other body of water.

15. **Reactivate treatment systems.** When all traces of chlorine are gone, place the already disinfected water treatment units back “on-line”.

16. **Sample.** Collect a bacteriological sample to verify water supply is safe. Sample bottles can be picked up at any Ottawa County office; the cost for testing is \$15.00.

If you have any questions about the above procedure contact Ottawa County Environmental Health at (616) 393-5645.