Fact Sheet

# Water Safety

## Well Water Disinfection Procedures

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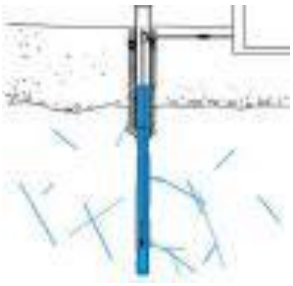

This informational sheet describes the procedures to use when disinfecting water wells using *common household unscented bleach* - 5.25% sodium hypochlorite. *Do not attempt any of these procedures with any other concentration or other type(s) of disinfectants.*

It is essential that the well construction details be known prior to attempting disinfection: type of pump and its internal parts, corrosion of pump and internal parts, potential for electric shock, exposure to fumes, and any other water quality concerns that can complicate the disinfection procedure. These considerations may require equipment and expert knowledge from a qualified professional.

The procedures described below may generally be used on drilled wells with submersible pumps or double pipe deep-well jet installations. These procedures may also be used on dug wells; *however*, it should be emphasized that dug well chlorination will likely not be successful in permanently eliminating bacterial contamination. *Well types other than those specified above, including flowing wells, present special problems in well disinfection, necessitating some degree of disassembly of internal parts.*

## Basic Chlorination Procedures

1. Determine the amount of bleach required to obtain 500 parts per million (ppm) in the total volume of the well casing. See Table 1. Use unscented household type bleach which contains 5.25% sodium hypochlorite solution.

| WELL DEPTH | DIAMETER OF CASING | | | | | |
|---|---|---|---|---|---|---|
| | 1" inch | 2" inch | 3" inch | 4" inch | 5" inch | 6" inch |
| **25' to 50' feet** | ¼ cup | ¾ cup | 1½ cups | 2½ cups | 3½ cups | 5 cups |
| **50' to 100' feet** | ½ cup | 1½ cups | 3 cups | 5 cups | 7 cups | 10 cups |
| **100' to 150' feet** | 1 cup | 3 cups | 4 cups | 7 cups | 10 cups | 15 cups |
| **150' plus feet** | Use ½ to 1 gallon of bleach | | | | | |

**Table 1**

2. Dilute the above volume of bleach in five gallons of water. Also, set aside an additional five gallons of non-chlorinated water for Step 5.
3. Remove the well cap and pour chlorine solution down the well. Allow solution to run down the inside wall of the outer casing. Before pouring solution, make sure any electrical connections are protected to avoid a shock.
4. Connect a clean (preferably new) hose to the first available outlet on the distribution system (pressure tank preferably) and run hose back to the well casing. Run water to re-circulate back to the well for 30 to 60 minutes.
5. Remove hose and pour the five gallons of clear water down the casing to rinse off any remaining chlorine. Replace well cap securely.

6. Turn on faucets in the house (one at a time) and allow them to run just until a bleach odor is detected. Don't forget outside faucets, bathrooms, laundry, etc.
7. Allow bleach solution to remain in the system for 12 to 24 hours (do not use the water during this time).

   After the 12 to 24 hours has passed, turn on the faucets to flush the water lines and the well until water is clear and no chlorine odor is detected. This may take several hours. *Flushing through outside faucets first is recommended to avoid overloading the septic system.*

## Contaminated Well Disinfection Procedure

If it is suspected that a well may be contaminated, contact the health department or agriculture extension agent for specific advice. Here are some general instructions for disinfecting wells:

### To Disinfect Bored or Dug Wells:

1. To determine the exact amount of bleach to use, multiply the amount of disinfectant needed (according to the diameter of the well) by the depth of the well. For example, a well five feet in diameter requires 4½ cups of bleach per foot of water. If the well is 30 feet deep multiply 4½ by 30 to determine the total cups of bleach required (4½ X 30 = 135 cups). There are 16 cups in each gallon of liquid bleach. See Table 2.
2. Add this total amount of disinfectant to about 10 gallons of water. Splash the mixture around the wall or lining of the well. Be certain the disinfectant solution contacts all parts of the well.
3. Seal the well top.
4. Open all faucets and pump water until a strong odor of bleach is noticeable at each faucet. Then stop the pump and allow the solution to remain in the well overnight.
5. The next day, operate the pump by turning on all faucets, continuing until the chlorine odor disappears. Adjust the flow of water faucets or fixtures that discharge to septic systems to a low flow to avoid overloading the disposal system.

### To Disinfect Drilled Wells:

1. Determine the amount of water in the well by multiplying the gallons per foot by the depth of the well in feet. For example, a well with a 6-inch diameter contains 1.5 gallons of water per foot. If the well is 120 feet deep, multiply 1.5 by 120 (1.5 X 120 = 180).
2. For each 100 gallons of water in the well, use the amount of chlorine (liquid or granules) indicated in Table 3. Mix the total amount of liquid or granules with about 10 gallons of water.
3. Pour the solution into the top of the well before the seal is installed.
4. Connect a hose from a faucet on the discharge side of the pressure tank to the well casing top. Start the pump. Spray the water back into the well and wash the sides of the casing for at least 15 minutes.
5. Open every faucet in the system and let the water run until the smell of chlorine can be detected. Then close all the faucets and seal the top of the well.
6. Let stand for several hours, preferably overnight.
7. After letting the water stand, operate the pump by turning on all faucets continuing until all odor of chlorine disappears. Adjust the flow of water from faucets or fixtures that discharge into septic tank systems to a low flow to avoid overloading the disposal system.

**BLEACH FOR A DRILLED WELL**

| **Diameter of Well** *(in inches)* | **Gallons** *(per foot of water)* |
|---|---|
| 3 | 0.37 |
| 4 | 0.65 |
| 5 | 1.0 |
| 6 | 1.5 |
| 8 | 2.6 |
| 10 | 4.1 |
| 12 | 6.0 |

**Table 2**

**AMOUNT OF DISINFECTANT REQUIRED FOR EACH 100 GALLONS OF WATER**

| | |
|---|---|
| Laundry Bleach (5.25% sodium hypochlorite) | 7-10 cups* |
| Hypochloride Granules (70% Chlorine) | 2 ounces** |
| *1 cup = 8 ounce measuring cup<br>**1 ounce = 2 heaping tablespoons of granules | |

**Table 3**

***For more sources of information on this topic visit:***
ST. CLAIR COUNTY HEALTH DEPARTMENT www.scchealth.co
CENTERS FOR DISEASE CONTROL AND PREVENTION www.cdc.gov
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) www.michigan.gov/deq