

Shock Disinfection of Water Supply Systems

When a water supply has been exposed to bacterial contamination, it is advisable to disinfect the system using chlorine bleach. Disinfection should occur after: construction of a new water supply, repairs are made to an existing water supply, a positive coliform or E. coli test, or any time the well cap or lid has been removed.

The disinfection process outlined below is intended to eliminate the effects of previous contamination, but will not continue to disinfect or render safe a water supply which is continuously or intermittently contaminated. Therefore, before disinfecting the water supply system, all sources of pollution should be eliminated and proper repairs should be made. Contact a water system specialist or the Madison County Health Department (MCHD) for advice.

The most convenient source of chlorine is ordinary household bleach. Chlorine bleach contains about 5.25% chlorine (sodium hypochlorite) and is available at most grocery stores. Note that "Ultra" Chlorine Bleach products contain 6% chlorine. If possible, use NSF approved chlorine, as other types have additives in them. **DO NOT** use scented bleach.

Shock Disinfection Procedure:

Thoroughly read all instructions before starting the procedure

1. Ensure that you have potable drinking water (bottled water or disinfected well water) available. Your well water will be heavily chlorinated for 1-2 days after this procedure, so you may consider doing laundry and showering before you begin.
2. Disconnect carbon or charcoal filters. Chlorinated water should be allowed to pass through water treatment devices such as softeners, iron filters and water sand filters to disinfect them. Water softeners can be shocked separately by adding 1/2C household bleach into the salt(brine) solution. Check with the manufacturer to ensure chlorine will not damage the water treatment equipment. To save energy during this procedure, turn your hot water heater to pilot if it is gas, or off if it is electric.
3. Clean the well and any storage tanks. Using a hose, rinse down the inside of the casing of the well. Then run the hose away from the well until the water is clear.
4. Refer to the charts on back of this sheet to determine the amount of chlorine to use. Dilute the chlorine in a 5 or 10 gallon bucket with water, then pour this dilution into the well casing, dug well, reservoir, or other structure to be disinfected.
5. Run the hose into the well again for at least 10 minutes to mix and recirculate the chlorine solution. Cover the well.
6. Turn on each indoor and outdoor tap, one at a time. When the water coming out has a strong chlorine odor, turn that tap off and proceed to the next one. Allow the chlorine solution to sit in the distribution piping for the amount of time specified below. This step sanitizes the distribution piping.
7. Flush the chlorinated water from all the lines after the contact time has elapsed. You may want to run water through a hose to the road ditch or a location away from the well or septic system before turning on the indoor faucets. This is not required, but prevents the exposure of your septic system to high levels of chlorine. Repeated exposure to elevated chlorine levels can negatively impact the functioning of your septic system. Also, be aware that heavily chlorinated water can be harmful to your lawn, trees, or garden. Discoloration of the water may occur.
8. Reconnect any water conditioning equipment you may have disconnected. Continue to use the water for all household purposes except those intended for consumption (drinking, ice making, washing of fruits and vegetables to be eaten raw). After one to two weeks, collect a water sample for bacteriological testing. It is critical when resampling that no chlorine be present in the water. If the bacteriological problem has not been eliminated, contact the MCHD for further advice and assistance.
9. Ensure that the water continues to be safe to drink by testing the water for bacteria again, 2 to 3 months after the shock chlorination procedure.

Quantities of liquid household bleach, 5.25% sodium hypochlorite, required for water well disinfection (note that the stronger solution requires less contact time):

Table 1: **10 hour minimum contact time**
(100 ppm chlorine concentration)

Feet of water in well	Well Diameter (Inches)				
	3	4	5	6	8
30	.5C	.75C	1C	1.25C	2.5C
40	.5C	.75C	1.25C	2C	3.25C
60	.75C	1.25C	2C	2.75C	1.25Q
80	1C	1.75C	2.5C	3.75C	1.5Q
100	1.25C	2C	3C	1Q	2Q
150	1.75C	3C	1.25Q	1.75Q	3Q
200	2.25C	1Q	1.5Q	2.25Q	1G
250	2.75C	1.25Q	2Q	2.75Q	1.25G
300	3.5C	1.5Q	2.25Q	3.5Q	1.5G

Table 2: **4 hour minimum contact time**
(250 ppm chlorine concentration)

Feet of water in well	Well Diameter (Inches)				
	3	4	5	6	8
30	1C	1.75C	2.5C	3.75C	1.5Q
40	1.25C	2C	3.75C	1.25Q	2Q
60	2C	3.25C	1.25Q	2Q	3Q
80	2.5C	1Q	1.5Q	2.5Q	1G
100	3C	1.25Q	2Q	3Q	1.25G
150	3.5C	2Q	3Q	1.25G	1.75G
200	1.5Q	2.5Q	1G	1.5G	2.5G
250	1.75Q	3.25Q	1.25G	1.75G	3.25G
300	2.25Q	1G	1.5G	2.25G	4G

Table 3: Quantities of liquid household bleach, 5.25% sodium hypochlorite, to disinfect volumes of water in storage tanks

Chlorine concentration	Water in Gallons								
	100	200	250	500	750	1000	2000	5000	10000
100 PPM (10hr contact)	3C	1.5Q	2Q	1G	1.5G	2G	4G	9.5G	19G
250 PPM (4hr contact)	2Q	1G	1.25G	2.5G	2.75	5G	10G	25G	50G

KEY: C = cups Q = quarts G = gallons

Note: Caution should be exercised when handling bleach solutions. If chlorine accidentally gets on your skin, immediately flush the area with clean water.