

# What To Do If Your Well is Flooded

Common Sense Steps To Take If Your Well Is Covered by Flood Water



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Wells covered by flood water can become contaminated with bacteria, parasites and other pollutants.



# 1. What To Do If Your Well Is Covered by Flood Water

The three primary threats from a well that has been covered by flood waters are:

1. DANGER OF ELECTRICAL SHOCK
2. CONTAMINATION BY BACTERIA, PARASITES AND VIRUSES
3. DAMAGE TO WELL PUMP, PRESSURE TANK, PIPES AND ELECTRICAL

## **What can happen if my well is covered by flood waters?**

If your well is not tightly sealed or protected sediment and flood waters can enter the well and contaminate it with bacteria, parasites and viruses. Fast moving flood water can move large debris such as trees and building materials, which can damage the well head, piping and electrical system. Sand and other debris pouring into the well can cause pump wear and pumping problems. Sewage from damaged septic tanks, chemicals from agricultural operations, and other contaminants can be carried by the flood water and cause the well to become contaminated.

## **What should I do if my well is covered by flood waters?**

There is danger of electrical shock. Rubber gloves and boots are not adequate protection from electrical shock. It is best to avoid inspecting the well until all flood waters have receded and your well and wiring system has been checked by a qualified well or pump contractor, or an electrician.

## **What about my well pump and pressure tank?**

Well pumps and can be damaged by flood waters which often contain large amounts of sediment. The well pump and pressure tanks should be cleaned of silt and sand. Get help from a well or pump contractor who will be able to clean, repair or maintain different types of pumps.

## **How can I know if my water is safe to drink or not?**

Do not drink water from your well if it has been covered by flood water. If your well is older than 10 years and is less than 50 feet deep, it may be impacted by contamination, even if the actual well head is not covered. Shallow wells and/or older wells with bad well seals can be under the influence of surface water, even if the surface water is not directly covering the top of well.

## 2. Emergency Disinfection For Flooded Wells

**Before disinfecting your well check the condition of the well. Make sure there is no exposed or damaged wiring. Shock Hazard! Contact a well professional before the disinfection process if you have any doubt about the integrity or condition of your well. Do not attempt to do this yourself until your well has been inspected.**

**CAUTION: It is important to remember, while shock chlorination may correct immediate bacteria and/or odor problems in wells and piping systems, it does not correct the source of the bacteria. If bacteria are entering the well from a damaged or flooded septic tank or other source, one should correct the problem, otherwise bacteria will redevelop.**

### **How Shock Chlorination Works**

Shock chlorination involves introducing a strong chlorine solution into the water source and plumbing system, and letting it disinfect the system for 12 to 24 hours. You can use regular household bleach (non-perfumed type) that contains 5.25 percent sodium hypochlorite, which kills bacteria and certain viruses. You can also use pool chlorine, which is 10% to 12% sodium hypochlorite and twice as strong as household bleach, and/or calcium hypochlorite pellets.

### **Note of Caution:**

**Shock chlorination of wells or piping systems may loosen up scale, iron deposits and other materials, which can clog fixtures, appliances and valves in the piping system. Care should be taken when flushing the piping, and all aerators removed to prevent clogging. In some extreme cases of corroded piping, the piping may fail and start to leak after this procedure. Chlorination will not remove nitrate or other contaminants.**

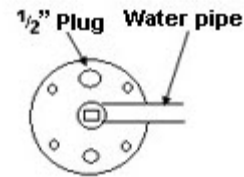
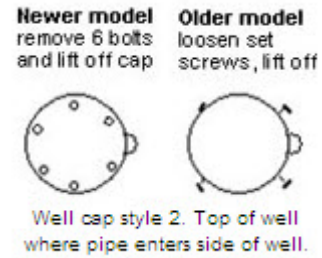
## 3. Shock Chlorination Using Chlorine Bleach:

1. Liquid chlorination using household bleach (sodium hypochlorite) 2. Dry pellet chlorination using 70% available (calcium hypochlorite) Shock Chlorination by Liquid Bleach: 1. Clean the well house, springhouse or storage tank or reservoir. Remove debris and scrub or hose off any dirt or other deposits or interior surfaces. Pump to remove any suspended solids or foreign matter in the water if possible. Scrub interior surfaces with a strong chlorine solution containing ½ gallon household bleach, or ¼ gallon of pool chlorine to each 5 gallons of water.

2. Determine how much chlorine to use to disinfect your well by consulting Table 1. If you don't know your well depth, contact your well driller as they often keep records that will show the depth of the well. Table 1 Wells: Amount of 5.25% bleach (sodium hypochlorite) needed for disinfection to obtain approximately a 50 ppm chlorine solution in the well. If using pool chlorine (12% sodium hypochlorite) double amounts below.

If you cannot contact the well driller and do not know the depth of your well, use 1 gallon of household bleach for the disinfection process.

Well Casing Diameter	Distance From Water Level to Bottom of Well (Water Depth)					
	0' - 50'	50' - 100'	100' - 200'	200' - 300'	300' - 400'	400' - 500'
4"	8 oz.	½ qt.	1 qt.	2 qt.	¾ gal.	¾ gal.
6"	½ qt.	1 qt.	¾ gal.	1 gal.	1 ¼ gal.	1 ½ gal.
8" - 12"	½ gal.	¾ gal.	1 ¼ gal.	1 ¾ gal.	2 ½ gal.	3 gal.
12" - 16"	½ gal.	1 gal.	2 gal.	3 gal.	4 gal.	5 gal.
20" - 24"	1 gal.	3 gal.	5 gal.	7 gal.	9 gal.	11 gal.
30" - 36"	3 gal.	5 gal.	10 gal.	15 gal.	20 gal.	25 gal.



Remove the ½" plug common on many well heads for pouring chlorine in to the well. Some wells have four bolts, one ½" plug, and one hole for pump wire. Do not remove top bolts for access without consulting a well driller or pump installer.

EXAMPLE: The well is 4" in diameter, with a depth of 400 feet. The water level is 100 feet below the surface.  $400 - 100 = 300$  feet. From Table 1, a 4 inch well with 300 feet of water takes 1 quart of bleach. NOTE: In applications where it is inconvenient to determine water depth, at least ½ gallon of household bleach, or ¼ gallon of pool chlorine, may be used for wells up to 8" in diameter with water estimated to be less than 80 feet deep; one gallon should be used for similar sized wells with water greater than 80 feet.

3. Mix the chlorine solution above with 10 times as much water before pouring down well. You can use buckets, or a clean plastic trash can or container. Avoid pouring strong bleach down the well if possible.

4. Open the well cap, or if your well has a well top seal, remove the ½" plug or air vent and use a large funnel to pour chlorine down well. CAUTION: well caps and seals are integral to the safety and integrity of your well. They are often regulated by the state and local codes. Be certain to comply with all applicable codes and licensing laws, whenever opening a well. If you are unsure of any of the following steps, seek the assistance of a qualified or licensed well driller or pump installer or contractor.

5. Do not attempt to remove the sanitary well seal without the assistance of a qualified well driller or pump contractor. Do not loosen the bolts that compress the seal.

6. Wells equipped with a packer jet pump can be thoroughly disinfected only through the removal of the pipe, pump and jet unit from the well.

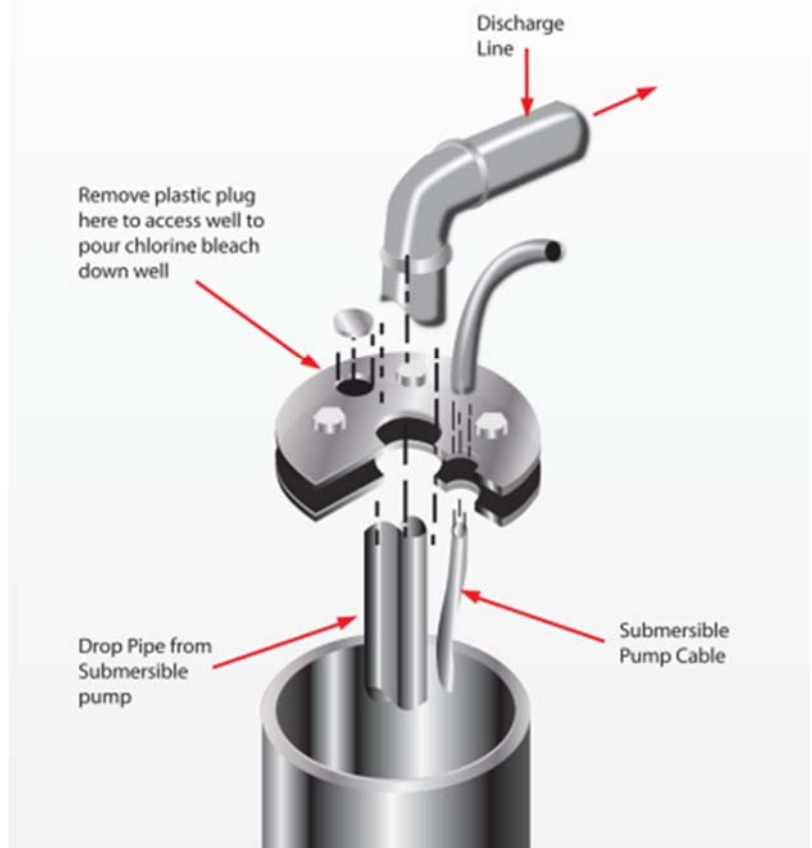
7. As you are adding the chlorine solution, take precautions to protect yourself from splashing chlorine and fumes. Protect your eyes with safety goggles, and wear protective gloves and clothing.

8. Pour the chlorine solution down the well. Avoid pouring the chlorine solution on the pump wire connectors.

9. If the well is relatively deep, the disinfectant may be dispersed to the bottom by alternatively starting and stopping the pump several times.

If possible, place a garden hose in the top of the well, and turn on the faucet and circulate the chlorine solution for 15 minutes until a strong chlorine odor is detected, or 50 ppm chlorine residual is detected, by using a chlorine test kit.

## Typical Deep Well Head



10. Add more bleach as needed to bring up the chlorine solution residual in the well to 50 to 100 ppm, or until you smell a strong bleach odor coming from the pipes and well.

11. Circulate the water from the well by connecting a garden hose to a nearby hose bib or sill cock, and feed the water back down into the well. This will also wash down the sides of the well and insure proper mixing. After approximately 15 minutes a strong chlorine odor should develop. To be more precise use a chlorine test kit to make sure the chlorine is over 50 ppm.

12. Water should be pumped from the well into the pressure tank and plumbing system.

13. All water faucets should be turned on in the house and all outside fixtures and hose bibs including fire hydrants, watering troughs, and other supply lines to other buildings, until 50 ppm is detected.

14. At this point, turn off the fixtures and let remain in the pipes a minimum of 8 hours, up to 12 hours.

15. After the chlorine has been left in the well and the plumbing system if applicable for a minimum of two hours, the chlorinated water can be discharged. Large amounts of chlorinated water should not be discharged into the septic tank.

**If possible, discharge as much of the water as possible through an outside faucet with hose attachment. Do not discharge the chlorinated water into streams or rivers.**

16. Backwash water softeners; flush the water heater; and replace all filters if present. Replace all carbon media, filter cartridges and any other filter media that has been exposed to the contaminated well water or disinfection process.

17. For wells and piping systems that have bacterial contamination or have been flooded, resample the water and retest for coliform bacteria, after all the chlorine residual is gone from the system.

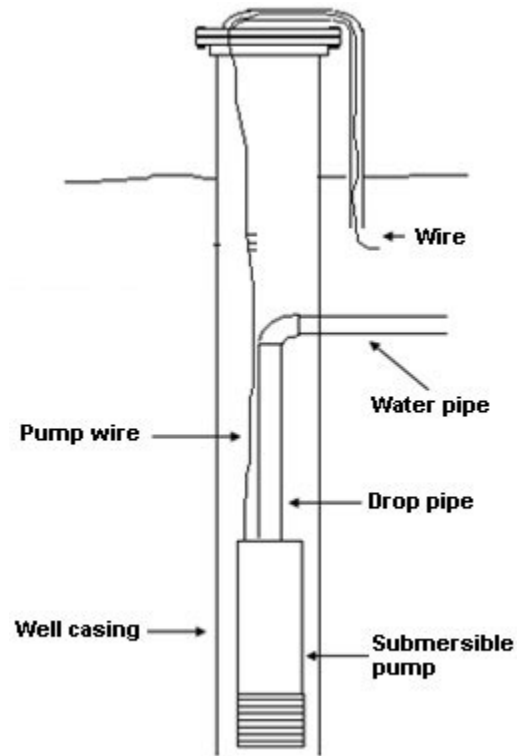
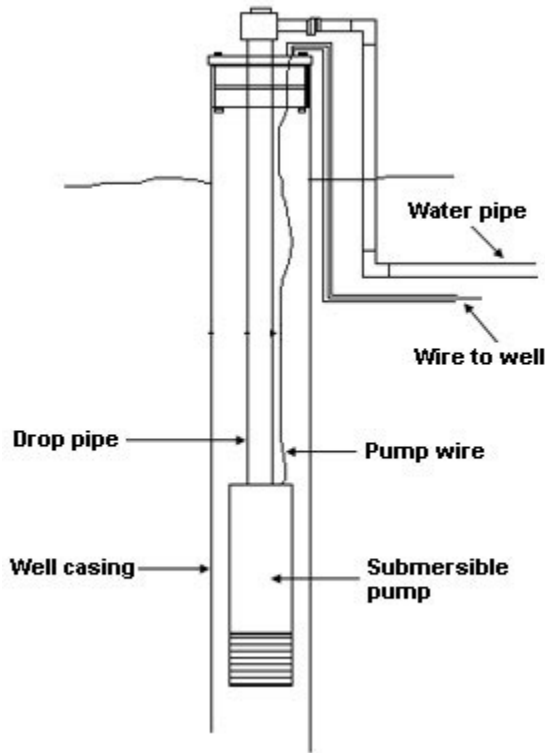
18. If bacteria are detected again, repeat procedures above. Until a safe test result is obtained, use an alternate known safe water source, or boil all water, or use bottled water. In case of large diameter wells, a greater quantity of chlorine solution is needed. As a general rule, it takes 1 gallon of 5% laundry bleach to treat 1000 gallons of water with 50 ppm of chlorine.

**NOTE OF CAUTION:** Heavily fouled wells can sometimes clog pipes and cause damage to pump during or after shock chlorination. While this is rare, consult a well contractor or pump company if you notice any loss of pressure or water flow after chlorinating a heavily-fouled well.

Wells with submersible pumps in freezing climates typically have the water pipe enter out through the side and travel underground to the house.

In many areas the water pipe comes out through the top.

To add chlorine to a well for the purpose of sanitizing, chlorine needs to be added into the top of well, but not down the water pipe.





## 4. What To Do If You Have an Existing Water Softener Or Filtration System

- Put the softener, iron filter or other system on bypass if a flood occurs
- If flood contaminated waters have passed through your treatment system, be sure to thoroughly sanitize the softener or filter before using. For softeners you can add ½ cup of bleach to the brine tank and regenerate, once the well has been tested and is declared safe to use.
- Some type of treatment systems contain activated carbon and the media should be replaced if contaminated water has passed through the system.
- Replace all filter cartridges and any carbon media in the system
- Sanitize all filter housings and piping with 50 to 100 PPM of chlorinated water. Allow to sit for 8 to 12 hours and then flush with disinfected or non-contaminated water.

Residential chlorination system with contact tank and carbon backwash filter



## 5. Sampling and Testing the Well Water

The USEPA Recommends:

Contact your local health department to have well water sampled and tested for contamination after the sanitizing procedure and prior to using the well water. You can also call your state laboratory certification officer to find a certified lab near you. You can get this number from the Safe Drinking Water Hotline (800-426-4791).

The health department or laboratory you are using will give you sterile bottles to collect water samples, follow all instructions for the use of these bottles.

After the pump is back in operation, you should sample and test the water at regular intervals.

If in doubt about the well water supply, follow health department drinking and bathing advisories

## 6. Do It Yourself Coliform Home Test Kits

**Coliform bacteria testing is now available in easy to use, at-home, do-it-yourself kits.**

Coliform Bacteria EZ Cult 24 Hour Presence / Absence of Total Coliforms. EPA Compliant. One Simple Test for E.coli. When using this simple test the media turns blue-green in the presence of coliform bacteria.

E. coli growth is confirmed by blue fluorescence under UV light (not included, purchase separately). Easy fast and effective method. Available in case of 12 tests or by individual test.

[www.cleanwaterstore.com/test-kit bacteria.html](http://www.cleanwaterstore.com/test-kit bacteria.html)

An optional UV light is available for determining if coliform present also has e. Coli bacteria present. This handheld UV Light is extremely bright and compact. It provides an excellent UV Light source and also includes a flashlight mode and a convenient hand strap. Simply shine the UV light on the sample to see if e. Coli is present.



## 7. Important Warnings and Guidelines:

1. Remember that there is a danger of electrical shock from any electrical device that has been flooded; consult a certified well water professional, licensed pump or well contractor, or a qualified electrician. Rubber boots and gloves are not adequate protection from electric shock.
2. Well disinfection will not provide protection from pesticides, heavy metals and other types of non-biological contamination. If such contamination is suspected, special treatment is required. Information on home water treatment units (also called point-of-use and point-of-entry units) is available from U.S. EPA by phoning the Safe Drinking Water Hotline (1-800-426-4791). If you observe chemical containers (including barrels and drums) that have moved to your property, call your state or county health department or the Superfund Hotline (1-800-424-9346).
3. For information on long-term water quality conditions in the area, consult your state or county health department. Well owners may have information about the construction, or testing of their well and this information will be helpful in determining water quality conditions.
4. Septic systems should not be used immediately after floods. Drain fields will not work until underground water has receded. Septic lines may have broken during the flood.
5. **USE ONLY DISINFECTED WATER FOR DRINKING, BATHING, COOKING, & WASHING**
6. It is advisable to use **bottled water** that has not been exposed to flood waters if it is available. If you have a UV sterilizer, chlorination, ozone, peroxide or other type of disinfection system, make sure the system is operating correctly before using. Flood waters can cause the water to become colored and/or high in turbidity which can cause your disinfection system to not operate correctly. Be safe. Test and verify the water is safe before using.
7. If you don't have bottled water, you can **boil water** to make it safe. Boiling will kill most types of disease-causing organisms that may be present. If the water is cloudy, filter it through a coffee filter or cloth, and allow it to settle. Pour off the clearest water for boiling. **Boil the water for 5 to 10 minutes**, let it cool, and store it in clean containers with covers. **Note that boiling the water will not remove high levels of nitrate, pesticides, industrial solvents or other chemicals that may be in your well water due to the flood event.**
8. If you can't boil water, **disinfect it using household bleach**. Bleach will kill some, but not all, types of disease-causing organisms. If the water is cloudy, filter it through a coffee filter or cloth, and allow it to settle, then draw off the clearest water for boiling. **Add 5 drops** of regular, unscented, liquid household bleach **for each quart of water**, stir it well, and let it stand for 30 minutes before you use it. Store in a clean sealed container or bottle.

## 8. Additional Information and Links:

For additional EPA related and other information, please review the following links:

[www.epa.gov/safewater/privatewells/whatdo.html](http://www.epa.gov/safewater/privatewells/whatdo.html)

[www.epa.gov/safewater/faq/emergency\\_septic.html](http://www.epa.gov/safewater/faq/emergency_septic.html)

[www.epa.gov/ogwdw000/faq/emerg.html](http://www.epa.gov/ogwdw000/faq/emerg.html)

<http://www.cleanwaterstore.com/technical/how-to-sanitize-pipelines.php>

<http://www.cleanwaterstore.com/bacteria.php>

Some information courtesy of the U.S. Environmental Protection Agency