



FLOOD RECOVERY - Restoring Water Wells

After flooding, private well owners should take actions to ensure their private water supply is safe for consumption. When a water supply well has been affected by flood waters, the water within the well may be contaminated with waterborne pathogens (germs) that can cause serious illness in humans and pets. If you believe that your well has been contaminated, discontinue using your well water for drinking and cooking purposes, and use only disinfected or bottled water.

This fact sheet provides guidance on how to address possible pathogen contamination. Drinking water wells can also be contaminated by fuel oil or other chemical products released during the flood (such as from home oil tanks and agricultural tanks). *If you believe your well may be contaminated by petroleum or other chemicals, do not use your well and immediately contact your local Health Department or the Department of Environmental Conservation Spill Hotline at 1-800-457-7362.*

There are five action steps needed to get a flooded well back into service safely:
Assessment... Repair... Flushing... Disinfection... Sampling.

ASSESSMENT

A flood will leave warning signs that a water well may be unsafe. Below are things that a well owner can look for, any one of these signs may indicate that a well is contaminated. Most private wells have the pump located inside the well casing and submerged, so well owners will probably not be able to inspect the pump. Well owners should contact a qualified professional, registered well driller or pump contractor, to evaluate and service well pumps.

1. Is the well located in or near the area that was flooded? If you did not see the area during the flood, debris and mud in the area and water or mud stains on the well can indicate that the well was flooded.
2. Is the ground surface around the well intact and stable? During flooding the ground around the well may erode, possibly creating unsafe conditions or a pathway for surface water and contaminants to enter the well.
3. Are there any electrical components or wires visible? Visible electrical wires may be dangerous and should be avoided due to electrical shock. If electrical connections or controls located outside the well casing remain submerged, turning on the pump may cause electrical shock or damage to the system. A qualified electrician should be contacted.
4. Is any damage to the well casing visible? A bent or cracked well casing may allow surface water, sediment and debris to enter the well and will increase the risk of contamination.
5. Is the well cap and seal securely fastened to the well casing? A loose well cap can allow sediment and debris to enter the well and contaminate it.

REPAIR

Do not turn on your well pump until the well has been assessed and repaired as needed. And do not drink or wash with well water until the well has been restored by proper disinfection and flushing. Here are some well restoration and repair tips:

General Cleaning. To avoid damage to the well, mud, silt and other debris should be removed from the well casing, cap, and other accessible components. Be sure electricity is off before you clean any electrical components. If excessive mud, silt or sediment has entered the well, the pump may need to be removed before cleaning can take place.

Well Drainage - Regrade the ground around the well to direct all surface water away from the well casing. Surface water will contain contaminants that can readily migrate into the well if surface water is allowed to flow down along the well casing.

Well and Pump Inspection - Floodwater carries large debris that can dislodge parts of the well and distort or crack the well casing. Floodwater may also deposit a large amount of sediment in the well. If any of these conditions are observed you should have professionals repair your system.

Electrical System - If the pump's control box was submerged during the flood, its electrical components should be cleaned and dry before electrical service is restored. Do not attempt to clean electrical components without being 100% sure electricity is shut off. Consider hiring a qualified electrician to clean and inspect.

Pump Operation - If after cleaning and general repair, your well will not start or pump water, turn off the electricity and get assistance from a registered well driller or pump contractor.

Pumping the Well. After the well has been inspected and cleaned, the well should be pumped until the water runs clear to rid the well of floodwater. Use an outside spigot and a hose to direct the water to a nearby drainageway rather than into your septic system or public sewer (after flooding, both septic and public sewers may be overwhelmed and do not need more water). Depending on the size and depth of the well and extent of contamination, pumping times will vary... it may take thirty minutes, or it could be several hours or days.

DISINFECTION

Any water well that has been flooded should be disinfected before using it for washing, drinking or cooking. Even if your well is operational, you should disinfect your water until it is tested and found suitable for drinking. Changes in the water's appearance, taste or odor may indicate possible contamination.

DISINFECTING WATER FOR HOME USE: If your well was impacted by flooding, you can disinfect the water to make it safe for drinking and culinary purposes. Here are three different ways to do this:

Disinfection by Boiling: (NOTE: Disinfection by boiling produces the safest water)

- Bring water to a rolling boil, and keep a full boil for at least one minute.

- Let the water cool before drinking.
- Boiled water will taste better if you put oxygen back into it by pouring it back and forth between two containers. This will also improve the taste of stored water.

Using Liquid Chlorine Bleach

- Disinfect water by adding eight drops of liquid chlorine bleach (4-6% available chlorine) per gallon of water (up to sixteen drops if the water is cloudy)
- Stir, and let stand for 30 minutes.
- If the water does not taste and smell of chlorine at that point, add another dose of bleach and let stand for another 15 minutes.

Using Iodine or Chlorine Tablets

- Check the expiration date for the tablets before using.
- Follow the package directions.
- Usually one tablet is enough for one quart of water.
- Double the dose if the water is cloudy.

DISINFECTING A WELL: Here is a step by step method to sanitize a contaminated well before restoring it to full use:

1. Attach a hose to the outdoor faucet that is closest to the well or pressure tank. Run water through the hose until it is clear.
2. Mix two quarts household bleach containing about 5% chlorine in 10 gallons of water in a large bucket or pail in the area of the well casing.
3. Turn electrical power off to the well pump. Carefully remove the well cap and well seal if necessary. Set aside.
4. Place hose connected to outdoor faucet inside the well casing. Turn electrical power back on to the well pump and turn water on to run the pump.
5. Carefully pour the water and bleach mixture from the bucket or pail down the open well casing. At the same time, continue to run the water from the hose placed inside the well casing.
6. At each indoor and outdoor faucet, run the water until a chlorine odor is present, then shut each faucet off.
7. Continue running water through the hose, down inside the well casing to recirculate the chlorine treated water. Use the hose to also wash down the inside of the well casing.
8. After one hour of recirculating the water, shut all faucets off to stop the pump. Disconnect power supply to pump. Remove recirculator hose from well.
9. Mix two more quarts of bleach in 10 gallons of water and pour mixture down the well casing. Disinfect the well cap and seal by rinsing with a chlorine solution. Replace well seal

and cap. Allow the well to stand idle for at least eight hours and preferably 12 to 24 hours. Avoid using the water during this time.

10. After the well has been idle for the recommended period of time, flush the chlorinated water out of the well. Turn the pump on and run the water using an outdoor faucet and garden hose in an area away from grass and shrubbery until the odor of chlorine disappears. Run all indoor and outdoor faucets until the odor and taste of chlorine disappears.

SAMPLING

After a contaminated well has been properly disinfected and the chlorine has been flushed out of the water system, the water should be tested to confirm that contamination has been removed. If chlorine odors persist, you may have to do additional flushing or wait several days before testing to be sure that all the chlorine has been flushed from the water system. Until testing shows that the water is free of contamination, you should continue to use bottled water or disinfect water for drinking and food preparation as described in the section **Disinfecting Water**.

You may wish to consider retesting the well water again after several weeks. If flooding and groundwater contamination is extensive, your well may be susceptible to recontamination for some time.

You can contact your local Health Department for more information about testing your well. Contact information for the health office that serves your county can be found on the DOH website at: http://www.nyhealth.gov/nysdoh/water/doh_pub_contacts_map.htm

ADDITIONAL PROTECTION MEASURES

There are some improvements you can take to protect your well from future damage.

New Well. If frequent flooding of your well occurs, consider drilling a new well where it is not subject to seasonal flooding. Make sure your well is constructed in such a manner that seasonal floodwater cannot enter the well. Contact a registered well driller for advice.

Grading. The ground surface immediately surrounding a well casing and, if possible, the property in general, should be graded to divert surface water away from the well. If erosion around the well has been a problem, consider armoring the area with vegetation or other erosion control measures

Extend Casing. Casing can be extended to a height above the expected or experienced level of the floodwater to protect against wellhead submersion.

Well Cap. Install a watertight and vermin proof well cap.