



WHAT SHOULD I DO WHEN MY WELL FLOODS?



If your water well is currently flooded or has been exposed to flooding conditions, you should contact an Iowa DNR [Certified Well Contractor](#) for assistance in determining the safety of your well and water distribution system!

- WARNING! -

DO NOT DRINK OR WASH WITH THE WELL WATER

People who drink, wash with, or prepare food with water from a water supply influenced by flood water can get very SICK!



**DO NOT ATTEMPT TO WORK ON THE WELL,
THE WELL PUMP, OR THE WATER SYSTEM**



There is a real danger of electrical shock, personal injury or death and well, well pump, and water system damage!

All wells located in areas where flood waters can reach, or wells located in areas where the groundwater can be influenced by flood waters or high groundwater tables due to excessive rain, should be viewed as **UNSAFE** for drinking and other normal household uses until the well water has been sampled, and the water analyzed by a [Iowa DNR Certified Drinking Water Laboratory](#), and the water analysis report states the water is safe to drink.

Homeowners returning to their properties after flood waters have receded are often anxious to use the water for cleaning and bathing purposes. Please keep in mind that flooding can contaminate your water source. Contaminated sources are not potable sources and can cause serious health problems for you and your family. Any well that has been influenced by flood water requires professional assessment, necessary cleaning and repairs, chlorination, and water quality testing that proves it's safe to drink before it should be used again.

If you suspect that your well/drinking water is contaminated for any reason, you should immediately stop using the water for drinking, ice making, cooking, brushing teeth, washing, and bathing. You should temporarily switch to a known safe source of water such as a neighbor's well that has recently been proven safe through water testing, a community water supply, or purchased bottled water. If you don't have a source of safe water and must use your own water, you can boil clear well water for at least 1 minute at a rolling boil and then let the water stand until cool before use.

Please be aware that boiling water can increase the concentration of certain contaminants like nitrate. Because of this, you should only consume boiled water when an alternative source of safe drinking water is not available.

The purpose of this document is to provide well owners and well users with additional information regarding their drinking water supply wells when faced with heavy rain events and localized flooding.

The document has been assembled in a "question and answer" format so you can view the questions without reading the entire document. There is a table of contents to allow you view the information that may interest you.

In addition to the answers to commonly asked questions, at the end of this document we have additional web resources that will help you obtain information on a wide variety of well topics.

The information contained in this document was compiled from various state and local health departments and environmental health departments.

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In general, Iowa has a plentiful supply of safe, good quality groundwater available for residents to access and use. Properly managing your private water supply is a vital responsibility that will help ensure that your well can provide you with dependable, safe drinking water.

Flooding events and the high groundwater levels caused by heavy rain can present major health risks to some well users. In some cases, the surface and shallow groundwater can contaminate your well and the aquifer it connects to. This is especially true if your well is located in or very near a floodway. Because of this, you should be aware of flood related conditions that may pose a risk for your family's health and only use drinking water that is from a known safe water source.

Common questions and answers about water supply wells and flooding conditions

Why should I worry about my well during flood situations?

- What you can't see can harm you. Wells can be contaminated, even if there's no apparent damage and the water looks clear. Older wells may have hidden construction defects or age related defects that allow flood water to enter the well and contaminate the water.
- If the well casing isn't finished above the high water level and tightly capped, flood water and sediment can enter the well and cause aquifer damage and well contamination.
- Sediment found in the flood waters can enter the well through well vents and leaky wiring conduits causing contamination of your water source. The sediment can settle to the bottom of the well where it plugs the aquifer and require expensive well clean-outs using heavy equipment.
- Bacteria, viruses, farm and industrial chemicals, and other contaminants like manure and sewage can be contained in floodwaters. This contaminated water can enter the well casing through the top of your well or through defects in the well's casing. Contaminants can migrate underground to your well via a neighbor's flooded well or any unplugged wells. Such contamination can make your water unsafe for all normal household uses.
- Flood water can carry debris that can hit the well and loosen well hardware, dislodge well vents and caps, or distort and damage well casing and pumping system components.

Well Site Locations – Is my well susceptible to flooding?

- Wells that are located in low landscape positions or in areas near streams, rivers or waterways, are directly susceptible to flood waters and the associated water quality problems that flooding can cause.
- Wells that are covered by flood waters can affect the drinking water of nearby well users even if the surrounding wells were not flooded.

Wells located below the ground surface in frost pits are susceptible to influence of high groundwater levels and flood waters. Wells contained in frost pits can be flooded even if there is no water standing on the lands surface.

Frost pits are [confined spaces](#) and pose a number of safety risks.

Because of this, any pit or vault should not be entered by the well owner.

- Hire only [Iowa DNR Certified Well Contractors](#) to assess and repair any damaged well and pumping system components, and to have the well shock chlorinated for disinfection of the entire well and water system.

My well has electrical connections – can this be a hazard?

- **YES!** [Shock hazards exist](#) with components associated with wells. **DO NOT** attempt to work on a wet electrical system.
- After the flood waters have receded, the pump and electrical systems need to be thoroughly dried and evaluated for damage.
- Always get assistance in starting a well pump after a flood event. **DO NOT** turn on the pumping equipment until the pump's electrical system has been checked by an [Iowa DNR Certified Well Pump Installer](#).

Is there a chance that my well pump will be damaged?

- **YES!** Well pumps can be filled with silt, sand or other debris found in flood water. They can also fall to the bottom of a well if the casing experiences a severe impact from floating debris. This complicates the well repair and adds expenses for “fishing” the pump from the bottom of the well as well as fixing all defects discovered by the repair work.
- All well pump electrical devices, wiring, and wiring connections exposed to floodwater or high groundwater may be damaged and create hazards due to contaminated water, sediment, and debris.
- You should hire an [Iowa DNR Certified Pump Installer](#) to assess and repair your pumping system and to have the well shock chlorinated. Shock chlorination is an important step taken to kill bacteria and virus that may have entered the well during the flood event.

How do I clean up my well? – Shock Chlorination

- Once flood waters have receded you should hire an [Iowa DNR Certified Well Contractor](#) to ensure that your water system is safe to operate. This inspection should look at all of the protections required for the type of well you are using. Any deficiencies should be addressed immediately to reduce the potential for future well related problems.
- Once the pumping system can be safely energized, the well should be pumped until the water appears clear for an extended period of time – This is especially important if the well exhibits dirty or turbid water during the initial minutes of operation. Please note that not all wells are capable of producing water for long periods of time. If you're not careful, you can ruin your expensive well pump. You must be observant during this step and shut off the power to the pump if the water stops flowing.
- The well requires shock chlorination to disinfect the well, the pressure tank, and the distribution system before the well is put back into service.

- A chlorine solution of at least 200 mg/L should be introduced into the top of the well and should be allowed to treat the entire water column inside the well. The chlorinated water should completely coat all of the well's interior surfaces. Then, the treated water should flow through the entire water system including all faucets, hot water heater, toilet tanks, ice makers, yard hydrants, and livestock watering stations.
 - The chlorine solution should be allowed to sit in the well and water system for a period of 4 - 8 hours before any additional water used.
 - The chlorine must be pumped out of the well and water system before the well water can be tested and the water used.
 - For severe flood related contamination, the well may require additional shock chlorination(s).
 - For best results, chlorination of a well that has been flooded should be done by an Iowa DNR Certified Well Contractor. Lists of certified well contractors are available at the following web page: www.iowadnr.gov/wellcontractorcirt or contact your local county health department for more information.
- Some wells may require a thorough cleaning before the water can be tested and the well placed back into service. Your local Iowa DNR Certified Well Contractor can provide additional information.
 - Please keep in mind that well disinfection will not provide protection from pesticides, heavy metals, fuels, oils, and other types of non-biological contamination. If you suspect such contamination due to proximity of these types of contaminant sources, special testing and then treatment of the well water is required. Please contact your local county health department or the [State Hygienic Laboratory at The University of Iowa](#) for more information.

How do I know if my water is safe to drink again?

- All wells and water systems that have been influenced by flood waters should be considered **UNSAFE** for use as drinking water until you submit a water sample to an [Iowa DNR Certified Drinking Water Laboratory](#) AND the laboratory analysis report states that the water is safe to drink.
- Even if a well has been shock chlorinated, you should not drink or otherwise consume the water until you submit a water sample to a certified laboratory AND the laboratory analysis report states the well is safe to drink. Contact your local county health department for more information – see web link on page 8.
- Please remember that just because the water looks clean and clear doesn't mean that it's safe to drink and consume in other ways.

Who can perform Well Services in Iowa?

- [All Well Services](#) must be done by an Iowa [DNR Certified Well Contractor](#) or by the well owner doing the work themselves. Homeowners should not attempt well services that are beyond their understanding and/or technical abilities. Doing so places the homeowner at risk of injury or death, may cause damage to expensive well related equipment, makes the well

owner liable for well services that don't meet the minimum protective standards as found in Iowa Administrative Code, and potentially affects the water quality of neighboring wells.

- Please keep in mind that problems you create with your well can cause problems for neighboring well owners. For lists of [Iowa DNR Certified Well Contractors](#) please see the web link on page 8 or contact your local county health department for more information.

How do I protect my well from future flooding?

- Make sure that the well head is properly protected and includes all of the features needed to help reduce the impact that a potential flood event may have.
- A few examples of things you can do include:
 - o Eliminate frost pit well installations and frost pit pressure system installations
 - o Reconstruct the well head area to include a pitless adapter and a high quality well cap.
 - o Maintain the well's final casing height at least 12 inches above the historic high water levels.
 - o Protect the well area by constructing a berm of soil around the well so that flood water cannot pool in the well area.
 - o Inspect and repair or replace any non-conforming well cap. Make sure that a conforming well vent is placed above the historic high water level.
 - o Install all wiring in water-tight, sealed conduits. Move all pump related electrical devices and boxes to areas that will be dry.
 - o Locate the water system pressure tank and well controls in an area that is not prone to high water levels or flooding.
- If it isn't practical to protect the current well from flooding through well renovations or added well area protections, you should consider constructing a new well in a protected location.
 - o Any unused or unneeded wells that are positioned in flood prone areas must be properly plugged or renovated to a modern construction standard. This helps keep them from negatively impacting the water quality of your primary well or nearby wells.
 - o The Grants-to-Counties program may have grant funds available to pay for part of your well renovation or well plugging. Your [local county sanitarian](#) has additional information.
- Have the well and water system sampled and tested at least once a year so that you understand the safety of your drinking water. You should only use known safe water for all consumable purposes. Please contact your [local county sanitarian](#) for more information.

The Four Keys Points for Maintaining a Well

Please keep in mind that 1) proper well construction, 2) proper well head protection, 3) periodic inspection followed by timely well maintenance, and 4) periodic water testing are essential key points that you - as a well owner - can control. Proper management of these points can make a dramatic difference in the quality of water that your well supplies.

When you take an active role in managing your well, you can make informed decisions regarding the quality of your family's drinking water. You also help protect the quality of the groundwater that many others depend on.

Please consider calling one of your local [Iowa DNR Certified Well Contractors](#) to help answer questions related to your water supply. Your certified well contractor has the experience and the equipment necessary to help you determine if your well has structural problems or has missing or defective components that may affect the safety of your family's drinking water.

Additional Resources

[Iowa Department of Natural Resources Private Well Program](#)

On the web or by calling: Russ Tell, 515-725-0462 email at Russell.tell@dnr.iowa.gov

Private Well Consumer Information Booklet - flood reference on pages 19-20
www.iowadnr.gov/Portals/idnr/uploads/forms/5428168.pdf

Water Testing Information – www.iowadnr.gov/privatewelltesting

Well Plugging Information - www.iowadnr.gov/wellplugging

Find an Iowa DNR Certified Well Contractor – www.iowadnr.gov/wellcontractorcert

Local Iowa County Environmental Health Departments

www.iowadnr.gov/Portals/idnr/uploads/water/wells/co_sanitarians.pdf

Iowa Department of Public Health (IDPH)

<http://idph.iowa.gov/ehs>

Iowa State University Extension Service

Disaster Recovery – including well related topics
<http://eden.lsu.edu/Topics/Hazards/Floods/Pages/default.aspx>

Shock Chlorinating Small Water Systems
<https://store.extension.iastate.edu/Product/pm899-pdf>

Good Wells for Safe Water
www.extension.iastate.edu/publications/pm840.pdf

State Hygienic Laboratory at The University of Iowa

Frequently asked questions
www.shl.uiowa.edu/env/privatewell/faq.xml

Testing of your drinking water – Ordering a sample kit
www.shl.uiowa.edu/env/privatewell/ordering.xml

Flood Health and Safety
www.shl.uiowa.edu/env/privatewell/floodsafety.xml

Understanding you water test results
www.shl.uiowa.edu/env/privatewell/faq.xml#14

Additional Water Quality Tests
www.shl.uiowa.edu/env/privatewell/additionaltesting.xml

Centers for Disease Control and Prevention (CDC)

Water Related Emergencies and Outbreaks

www.cdc.gov/healthywater/emergency/safe_water/wells/

Disinfecting Wells Following an Emergency

www.cdc.gov/healthywater/emergency/drinking/disinfection-wells-drilled.html

United States Environmental Protection Agency (EPA)

Private Drinking Water Wells

www.epa.gov/safewater/privatewells/index2.html

What to Do After a Flood

www.epa.gov/privatewells/protect-your-homes-water#what

Emergency Disinfection of Water

www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water

The Iowa Water Well Association

An Iowa organization of professional water well contractors

<http://www.iwwa.org/>

The National Groundwater Association

A national organization of professional water well contractors

<http://www.ngwa.org/index.aspx>

Wellowner.org – Private Well Owner Tools

This is a good resource for private well information for well owners.

<http://www.wellowner.org/tools>

<http://wellowner.org/water-quality/flood/>

Private well owner tools

<http://www.wellowner.org/tools/>

The Water Systems Council - wellcare® information sheets

Fact sheets about water well related topics

<http://www.watersystemscouncil.org/well-owners/wellcare-info-sheets/>

National Environmental Service Center

Fact sheets about water well related topics

<http://www.nesc.wvu.edu/subpages/wells.cfm>



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