

Protect Wells From Contamination by Flooding



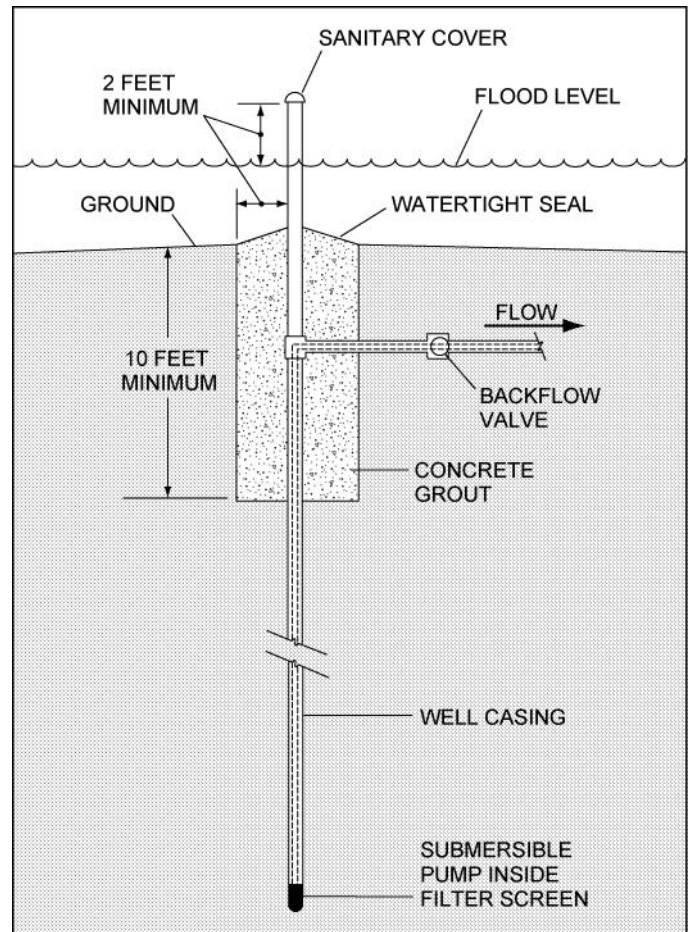
FEMA

PROTECTING YOUR PROPERTY FROM FLOODING

Flood waters often carry hazardous and toxic materials, including raw sewage, animal wastes, oil, gasoline, solvents, and chemicals such as pesticides and fertilizer. Flood water that enters a well can contaminate the groundwater and make the well water unsafe to drink or use. The effects may last long after the flood waters have receded.

Proper well construction will help protect your well against contamination. A licensed well-drilling contractor can inspect your well and suggest improvements, such as the following (see figure):

- Extending the well casing at least 2 feet above the highest known flood elevation
- Installing a sanitary seal or cover on the casing
- Curbing the casing at ground level by surrounding it with a watertight seal that is at least 4 inches thick and extends at least 2 feet in all directions
- Placing grout between the casing and the sides of the bore hole to a depth of at least 10 feet
- Installing a backflow valve in the water line
- Protecting electrical controls from flood water
- Drilling a new well on higher ground, above expected flood levels and known sources of pollution



BENEFITS OF UTILIZING THIS MITIGATION STRATEGY

- Helps to prevent contamination of drinking water or water for other uses

TIPS

Keep these points in mind when you improve your well to protect it from flooding:

- ✓ Many state and local agencies regulate the construction and modification of wells. Check with your local health department or building officials for more information.
- ✓ Power outages often occur during floods, so you should consider providing a backup power supply to ensure the continued operation of your well. (See fact sheet "Install a Generator for Emergency Power.")
- ✓ The vulnerability of a well to contamination by flood waters depends partly on the well's age and depth. Wells over 50 years old and less than 50 feet deep are more likely to be contaminated by flood waters.

- ✓ Do not store potential contaminants within 100 feet of the well. Potential contaminants include fuels, solvents, and dry and liquid chemicals.
- ✓ Have your water tested annually for the most common contaminants, including coliform bacteria.

ESTIMATED COST

The cost of most improvements to an existing well will vary, depending on the condition of the well. Having a plumber or contractor install a backflow valve in the water line will cost approximately \$500. This figure includes the cost of excavation and backfilling. Because geological conditions and groundwater yields vary from site to site, you should contact a local licensed well driller regarding the costs of other well improvements and new wells.

OTHER SOURCES OF INFORMATION

American Water Works Association Standards for Water Wells, AWWA, A100-06, 2006,
<http://www.awwa.org/Bookstore/productDetail.cfm?ItemNumber=4223>.

FEMA 348, *Protecting Building Utilities from Flood Damage*, Chapter 3, November 1999,
<http://www.fema.gov/library/viewRecord.do?id=1750>.

Install a Generator for Emergency Power, FEMA, April 2008,
<http://www.fema.gov/plan/prevent/howto/index.shtm>.

Wellhead Protection for Private Domestic Wells, A. Tyson, University of Georgia College of Agricultural & Environmental Sciences, 1993, <http://www.engr.uga.edu/service/extension/publications/c819-12c.html>.

To obtain copies of FEMA documents, call the FEMA Publications Warehouse at 1-800-480-2520 or visit FEMA's Library online at <http://www.fema.gov/library>.