Cleaning Up Water Systems

Flood Recovery for Homes and Business Structures

Bob Schultheis & Frank Wideman
Natural Resource Engineering Specialists
Dan Downing, Extension Water Quality Specialist – Updated March 2019

UNIVERSITY OF MISSOURI Extension
What We’ll Cover…..

• Reclaiming a flooded well
• Reclaiming a flooded septic system
• Making the house more flood-resistant
Reclaiming a Flooded Well

• Hire contractor to check for pump or electrical damage; let it dry out
• Pump the water until it is clear
• Scrub pump room with a 2% percent chlorine solution = 1 gal. bleach + 1 1/2 gal. water
Disinfecting a Flooded Well

- Well cap
- Vent pipe

Newer wells vs. Older wells
Disinfecting a Flooded Well

- Bypass the water softener
- Turn off electrical power to the pump
Disinfecting a Flooded Well

- Remove the well seal/cap and lift the wires aside
Disinfecting a Flooded Well

- Well diameter and water depth determines chlorine dosage
- Too much chlorine can damage rubber plumbing and electrical parts
Disinfecting a 6” Flooded Well

• Mix the chlorine/water solution in bucket
  ▪ Liquid bleach @ 1 pint per 25’ of water depth, or
  ▪ Chlorine tablets @ 0.5 lb. per 150’ of water depth
Disinfecting a Flooded Well

• Add the chlorine mix to the well
Disinfecting a Flooded Well

• Turn on pump power
• Attach garden hose to nearby faucet
• Recirculate water back down well casing until chlorine odor is detected
• Turn on each faucet one at a time until you smell chlorine odor
  ▪ May need to remove faucet aerators to prevent clogging
• Let chlorine water stand in system overnight to kill bacteria
Disinfecting a Flooded Well

• Starting outside, flush out system with water, until chlorine taste and odor are no longer present.
  ▪ May take 1 hour to 4 days to clear
  ▪ Avoid desirable vegetation
  ▪ Don’t overload septic system

• Retest for bacteria after 7-10 days
  ▪ $10 cost; DHSS has sterile sample bottle
  ▪ Keep sample cool & dark, get to lab in 6 hours

• Keep test results with important papers
Disinfecting a Cistern

- Pump dry with auxiliary pump. Do not pump water through the piping system.
- Wash walls, ceiling and floor with clean water and pump out the dirty water.
Disinfecting a Cistern

- Check walls, ceiling and floor for cracks.
- Disinfect cistern's interior with 1 qt. bleach + 3 gal. water. Apply with sprayer or stiff broom. Pump out solution that collects in cistern bottom.
Disinfecting a Cistern

• Decontaminate the piping system before using it. Disinfect, using the same procedure as for wells.

• Fill cistern with water for use and have it tested. The water should have a chlorine taste for a while, but it should be safe. Drinking water should be treated and boiled until the water is tested and found safe for drinking.
Reclaiming a Flooded Septic System

Figure 2. Illustration courtesy of the United States Environmental Protection Agency.

Schematic of a Drainfield
Reclaiming a Flooded Septic System

Figure 1. Illustration courtesy of the Maryland Department of the Environment.

Schematic of a Septic Tank
Reclaiming a Flooded Septic System

• Do not use the system until flood water has receded from all components of the system
• Shut off power to septic system sewage pumps until flood water goes down
• Don’t remove septic tank lid while tank is still under water
• Remove silt and other material from the septic tank, distribution boxes and sewage pump chambers after water recedes
• Limit water use until soils are no longer soggy
Reclaiming a Flooded Septic System

- Replace absorption field if it was silted in from septic tank
- Install effluent filter on outflow side of septic tank
Flood-Resistant Construction

- Wells
- Water heater
- Sewage backflow
- Electrical & HVAC
- Fuel tanks
- Building materials
Protecting Well from Flooding

- Extend well casing > 2 feet above the highest known flood elevation
- Install sanitary seal on casing
- Watertight seal at ground level 4 in. thick x 2 ft. radius around casing
- Grout 10 ft. deep between casing & bore hole
- Install backflow valve in the water line
- Protect electrical controls from flood water
- Drill a new well on higher ground, beyond flood levels and pollution sources

Source: www.fema.gov/plan/prevent/howto/index.shtm
Elevate Water Heater

• Hang from ceiling or bolt to wall
• Secure tank with plumber’s straps

Source: www.fema.gov/plan/prevent/howto/index.shtm
www.fema.gov/kids/p_mit04.htm
Install Sewer Backflow Valve

- Use licensed plumbing contractor & follow codes
- Installed on all pipes below flood level
  - Septic
  - Washing machine drain
  - Laundry sinks
  - Fuel oil lines
  - Rain downspouts
  - Sump pumps

Source: www.fema.gov/plan/prevent/howto/index.shtm
Raise Electrical & HVAC System

- Use licensed electrical contractor & follow codes
- Ask local power company about maximum height of electric meter
- Upgrade to more modern equipment (service panel, furnace)

Source: www.fema.gov/plan/prevent/howto/index.shtm
Anchoring Fuel Tanks

- Ground anchors and metal straps or cables, or
- Embed legs in concrete slab

Source: www.fema.gov/plan/prevent/howto/index.shtm
Building Material Selection

- Resist water damage or are water-tolerant
- Are easy to clean
- Allow wall and floor systems to drain and dry, or are easy to remove to allow drying
- Resist mold growth
- Do not transport water or moisture to adjacent materials
- Are dimensionally stable when exposed to water
- Maintain their strength and stiffness after exposure to water
Information Resources

• University of Missouri Extension
  Web: extension.missouri.edu/cemp
  extension.missouri.edu/pdf/YourFloodedHome.pdf

• HUD – Rehabbing Flooded Houses
  Web: www.huduser.org/Publications/pdf/Rehab_FloodedHouses.pdf

• Extension Disaster Education Network (EDEN)
  Web: www.agctr.lsu.edu/eden

• Federal Emergency Management Agency (FEMA)
  Web: www.fema.gov

• County Health Department
  Web: www.dhss.mo.gov

• County Emergency Management
Questions??

Contact your county University of Missouri Extension Office