



**Public Health**  
Prevent. Promote. Protect.

*Pike County General Health District*

# Flood Safety Recommendations

Updated March 2008

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*The following pages were compiled based on information from the Centers for Disease Control and Prevention.*

# Flood Readiness

## *Preparing for a Flood*

Here are some basic steps to take to prepare for the storm:

- Contact the local county geologist or county planning department to find out if your home is located in a flash-flood-prone area or landslide-prone area.
- Learn about your community's emergency plans, warning signals, evacuation routes, and locations of emergency shelters.
- Plan and practice a flood evacuation route with your family. Ask an out-of-state relative or friend to be the "family contact" in case your family is separated during a flood. Make sure everyone in your family knows the name, address, and phone number of this contact person.
- Post emergency phone numbers at every phone.
- Inform local authorities about any special needs, i.e., elderly or bedridden people, or anyone with a disability.
- Identify potential home hazards and know how to secure or protect them before the flood strikes. Be prepared to turn off electrical power when there is standing water, fallen power lines, or before you evacuate. Turn off gas and water supplies before you evacuate. Secure structurally unstable building materials.
- Buy a fire extinguisher and make sure your family knows where it is and how to use it.
- Buy and install sump pumps with back-up power.
- Have a licensed electrician raise electric components (switches, sockets, circuit breakers and wiring) at least 12" above your home's projected flood elevation.
- For drains, toilets, and other sewer connections, install backflow valves or plugs to prevent floodwaters from entering.
- Anchor fuel tanks which can contaminate your basement if torn free. An unanchored tank outside can be swept downstream and damage other houses.

## *If you are under a flood watch or warning:*

- Gather the emergency supplies you previously stocked in your home and stay tuned to local radio or television station for updates.
- Turn off all utilities at the main power switch and close the main gas valve if evacuation appears necessary.
- Have your immunization records handy or be aware of your last tetanus shot, in case you should receive a puncture wound or a wound becomes contaminated during or after the flood.
- Fill bathtubs, sinks and plastic soda bottles with clean water. Sanitize the sinks and tubs first by using bleach. Rinse and fill with clean water.
- Bring outdoor possessions, such as lawn furniture, grills and trash cans inside or tie them down securely.

## ***Emergency Supplies You Will Need:***

You should stock your home with supplies that may be needed during the emergency period. At a minimum, these supplies should include:

- Several clean containers for water, large enough for a 3-5 day supply of water (about five gallons for each person).
- A 3-5 day supply of non-perishable food and a non-electric can opener.
- A first aid kit and manual and prescription medicines and special medical needs.
- A battery-powered radio, flashlights, and extra batteries.
- Sleeping bags or extra blankets.
- Water-purifying supplies, such as chlorine or iodine tablets or unscented, ordinary household chlorine bleach.
- Baby food and/or prepared formula, diapers, and other baby supplies.
- Disposable cleaning cloths, such as "baby wipes" for the whole family to use in case bathing facilities are not available.
- Personal hygiene supplies, such as soap, toothpaste, sanitary napkins, etc.
- An emergency kit for your car with food, flares, booster cables, maps, tools, a first aid kit, fire extinguisher, sleeping bags, etc.
- Rubber boots, sturdy shoes, and waterproof gloves.
- Insect repellent containing DEET or Picaridin, screens, or long-sleeved and long-legged clothing for protection from mosquitoes which may gather in pooled water remaining after the flood. (More information about these and other recommended repellents can be found in the fact sheet "Updated Information Regarding Insect Repellents" at [www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm](http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm).)

## ***Preparing to Evacuate***

Expect the need to evacuate and prepare for it. When a flood watch is issued, you should:

- Fill your vehicle's gas tank and make sure the emergency kit for your car is ready.
- If no vehicle is available, make arrangements with friends or family for transportation.
- Fill your clean water containers.
- Review your emergency plans and supplies, checking to see if any items are missing.
- Tune in the radio or television for weather updates.
- Listen for disaster sirens and warning signals.
- Put livestock and family pets in a safe area. Due to food and sanitation requirements, emergency shelters cannot accept animals.
- Adjust the thermostat on refrigerators and freezers to the coolest possible temperature.

### ***If You Are Ordered to Evacuate***

You should never ignore an evacuation order. Authorities will direct you to leave if you are in a low-lying area, or within the greatest potential path of the rising waters. If a flood warning is issued for your area or you are directed by authorities to evacuate the area:

- Take only essential items with you.
- If you have time, turn off the gas, electricity, and water.
- Disconnect appliances to prevent electrical shock when power is restored.
- Follow the designated evacuation routes and expect heavy traffic.
- **Do not attempt to drive or walk across creeks or flooded roads.**  
It only takes two feet of water to float most cars. Swift moving water can disable the largest of vehicles.

### ***If You Are Ordered NOT to Evacuate***

To get through the storm in the safest possible manner:

- Monitor the radio or television for weather updates.
- Prepare to evacuate to a shelter or to a neighbor's home if your home is damaged, or if you are instructed to do so by emergency personnel.

## Reentering a Flooded Home

When returning to a home that's been flooded after a natural disaster be aware that your house may be contaminated with mold or sewage, which can cause health risks for your family.

### *When You First Reenter Your Home*

- If you have standing water in your home and can turn off the main power from a dry location, then go ahead and turn off the power, even if it delays cleaning. If you must enter standing water to access the main power switch, then call an electrician to turn it off. **NEVER turn power on or off yourself or use an electric tool or appliance while standing in water.**
- Have an electrician check the house's electrical system before turning the power on again.
- If the house has been closed up for several days, enter briefly to open doors and windows to let the house air out for awhile (at least 30 minutes) before you stay for any length of time.
- If your home has been flooded and has been closed up for several days, presume your home has been contaminated with mold.
- If your home has been flooded, it also may be contaminated with sewage.

### *Dry Out Your House*

If flood or storm water has entered your home, dry it out as soon as possible. Follow these steps:

- If you have electricity and an electrician has determined that it's safe to turn it on, use a "wet-dry" shop vacuum (or the vacuum function of a carpet steam cleaner), an electric-powered water transfer pump, or sump pump to remove standing water. If you are operating equipment in wet areas, be sure to wear rubber boots.
- If you do not have electricity, or it is not safe to turn it on, you can use a portable generator to power equipment to remove standing water. **Note: If you must use a gasoline-powered pump, generator, pressure washer, or any other gasoline-powered tools to clean your home, never operate the gasoline engine inside a home, basement, garage, carport, porch, or other enclosed or partially enclosed structures, even if the windows and doors are open. Such improper use can create dangerously high levels of carbon monoxide and cause carbon monoxide poisoning.**
- If weather permits, open windows and doors of the house to aid in the drying-out process.
- Use fans and dehumidifiers to remove excess moisture. Fans should be placed at a window or door to blow the air outwards rather than inwards, so not to spread the mold.

- Have your home heating, ventilating, and air-conditioning (HVAC) system checked and cleaned by a maintenance or service professional who is experienced in mold clean-up **before you turn it on**. If the HVAC system was flooded with water, turning on the mold-contaminated HVAC will spread mold throughout the house. Professional cleaning will kill the mold and prevent later mold growth. When the service determines that your system is clean and if it is safe to do so, you can turn it on and use it to help remove excess moisture from your home.
- Prevent water outdoors from reentering your home. For example, rain water from gutters or the roof should drain away from the house; the ground around the house should slope away from the house to keep basements and crawl spaces dry.
- Ensure that crawl spaces in basements have proper drainage to limit water seepage. Ventilate to allow the area to dry out.

For more information please see *Repairing Your Flooded Home* that is included with this document.

# Cleanup of Flood Water

**When returning to your home after a hurricane or flood, be aware that flood water may contain sewage.**

*Protect yourself and your family by following these steps:*

## *Inside the Home*

- Keep children and pets out of the affected area until cleanup has been completed.
- Wear rubber boots, rubber gloves, and goggles during cleanup of affected area.
- Remove and discard items that cannot be washed and disinfected (such as, mattresses, carpeting, carpet padding, rugs, upholstered furniture, cosmetics, stuffed animals, baby toys, pillows, foam rubber items, books, wall coverings, and most paper products).
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.
- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks, and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process by using fans, air conditioning units, and dehumidifiers.
- After completing the cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands).

Or you may use water that has been disinfected for personal hygiene use (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 minutes. If the water is cloudy, use a solution of 1/4 teaspoon of household bleach per 1 gallon of water.

- Wash all clothes worn during the cleanup in hot water and detergent. These clothes should be washed separately from uncontaminated clothes and linens.
- Wash clothes contaminated with flood or sewage water in hot water and detergent. It is recommended that a laundromat be used for washing large quantities of clothes and linens until your onsite wastewater system has been professionally inspected and serviced.
- Seek immediate medical attention if you become injured or ill.

## *Outside the Home*

- Keep children and pets out of the affected area until cleanup has been completed.
- Wear rubber boots, rubber gloves, and goggles during cleanup of affected area.
- Have your onsite waste-water system professionally inspected and serviced if you suspect damage.
- Wash all clothes worn during the cleanup in hot water and detergent. These clothes should be washed separately from uncontaminated clothes and linens.

- After completing the cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands). Or you may use water that has been disinfected for personal hygiene use (solution of  $\frac{1}{8}$  teaspoon of household bleach per 1 gallon of water). Let it stand for 30 minutes. If the water is cloudy, use solution of  $\frac{1}{4}$  teaspoon of household bleach per 1 gallon of water.
- Seek immediate medical attention if you become injured or ill.

For more information please see *Repairing Your Flooded Home* that is included with this document.

# Protecting Health and Safety after a Flood

## *Prevent illness from FOOD*

Food may not be safe to eat during and after an emergency. Safe water for drinking, cooking, and personal hygiene includes bottled, boiled, or treated water.

### *Identify and throw away food that may not be safe to eat.*

- Throw away food that may have come in contact with flood or storm water.
- Throw away food that has an unusual odor, color, or texture.
- Throw away perishable foods (including meat, poultry, fish, eggs and leftovers) that have been above 40 degrees Fahrenheit (F) for 2 hours or more.
- Thawed food that contains ice crystals or is 40 degree F or below can be refrozen or cooked.
- Throw away canned foods that are bulging, opened, or damaged.
- Food containers with screw-caps, snap-lids, crimped caps (soda pop bottles), twist caps, flip tops, snap-open, and home canned foods should be discarded if they have come into contact with floodwater because they cannot be disinfected.
- If cans have come in contact with floodwater or storm water, remove the labels, wash the cans, and dip them in a solution of 1 cup of bleach in 5 gallons of water. Relabel the cans with a marker.
- Do not use contaminated water to wash dishes, brush your teeth, wash and prepare food, wash your hands, make ice, or make baby formula.

### *Store food safely.*

- While the power is out, keep the refrigerator and freezer doors closed as much as possible.
- Add block ice or dry ice to your refrigerator if the electricity is expected to be off longer than 4 hours. Wear heavy gloves when handling ice.

### *Feeding Infants and Young Children*

- Breastfed infants should continue breastfeeding. For formula-fed infants, use ready-to-feed formula if possible. If using ready-to-feed formula is not possible, it is best to use bottled water to prepare powdered or concentrated formula. If bottled water is not available, use boiled water. Use treated water to prepare formula only if you do not have bottled or boiled water.
  - o If you prepare formula with boiled water, let the formula cool sufficiently before giving it to an infant.

- o Clean feeding bottles and nipples with bottled, boiled, or treated water before each use.
- o Wash your hands before preparing formula and before feeding an infant. You can use alcohol-based hand sanitizer for washing your hands if the water supply is limited.

### ***Prevent illness from WATER***

Water may not be safe to drink, clean with, or bathe in after an emergency such as a flood. During and after a disaster, water can become contaminated with microorganisms, such as bacteria, sewage, agricultural or industrial waste, chemicals, and other substances that can cause illness or death. This fact sheet offers the following guidance to help you make sure water is safe to use:

- Listen to and follow public announcements. Local authorities will tell you if tap water is safe to drink or to use for cooking or bathing. If the water is not safe to use, follow local instructions to use bottled water or to boil or disinfect water for cooking, cleaning, or bathing.
- Use only bottled, boiled, or treated water for drinking (however, see guidance in the Food section for infants), cooking or preparing food, washing dishes, cleaning, brushing your teeth, washing your hands, making ice, and bathing until your water supply is tested and found safe. If your water supply is limited, you can use alcohol-based hand sanitizer for washing your hands.
- If you use bottled water, be sure it came from a safe source. If you do not know that the water came from a safe source, you should boil or treat it before you use it.
- Boiling water, when practical, is the preferred way to kill harmful bacteria and parasites. Bringing water to a rolling boil for 1 minute will kill most organisms. Boiling will not remove chemical contaminants. If you suspect or are informed that water is contaminated with chemicals, seek another source of water, such as bottled water.
- If you can't boil water, you can treat water with chlorine tablets, iodine tablets, or unscented household chlorine bleach (5.25% sodium hypochlorite). If you use chlorine tablets or iodine tablets, follow the directions that come with the tablets. If you use household chlorine bleach, add 1/8 teaspoon (~0.75 milliliter [mL]) of bleach per gallon of water if the water is clear. For cloudy water, add 1/4 teaspoon (~1.50 mL) of bleach per gallon. Mix the solution thoroughly and let it stand for about 30 minutes before using it. Treating water with chlorine tablets, iodine tablets, or liquid bleach will not kill many parasitic organisms. Boiling is the best way to kill these organisms.
- Do not rely on water disinfection methods or devices that have not been recommended or approved by local health authorities. Contact your local health department for advice about water treatment products that are being advertised.

- Use water storage tanks and other types of containers with caution. For example, fire truck storage tanks and previously used cans or bottles may be contaminated with microbes or chemicals. Water containers should be thoroughly cleaned, then rinsed with a bleach solution before use.
  - o Clean surfaces thoroughly with soap and water, then rinse.
  - o For gallon- or liter-sized containers, add approximately 1 teaspoon (4.9 mL) household bleach (5.25%) with 1 cup (240 mL) water to make a bleach solution.
  - o Cover the container and agitate the bleach solution thoroughly, allowing it to contact all inside surfaces. Cover and let stand for 30 minutes, then rinse with potable water.
- Flooded, private water wells will need to be tested and disinfected after flood waters recede. If you suspect that your well may be contaminated, contact your local or state health department or agriculture extension agent for specific advice.
- Practice basic hygiene. Wash your hands with soap and bottled water or water that has been boiled or disinfected. Wash your hands before preparing food or eating, after toilet use, after participating in clean-up activities, and after handling articles contaminated with floodwater or sewage. Use an alcohol-based hand sanitizer to wash your hands if you have a limited supply of clean water.

### ***Prevent and treat OTHER ILLNESS and INJURIES***

**Prevent carbon monoxide poisoning.** Carbon monoxide is an odorless, colorless gas that is produced by many types of equipment and is poisonous to breathe. Don't use a generator, pressure washer, charcoal grill, camp stove, or other gasoline- or charcoal-burning device inside your home, basement, or garage or near a window, door, or vent. Don't run a car or truck inside a garage attached to your house, even if you leave the door open. Don't heat your house with a gas oven. If your carbon monoxide detector sounds, leave your home immediately and call 911. Seek prompt medical attention if you suspect carbon monoxide poisoning and are feeling dizzy, light-headed, or nauseated.

**Avoid floodwater and mosquitoes.** Follow all warnings about water on roadways. Do not drive vehicles or heavy equipment through water. If you have to work in or near floodwater, wear a life jacket. If you are caught in an area where floodwater is rising, wear a life jacket, or use some other type of flotation device. Prevent mosquito bites by wearing long pants, socks, and long-sleeved shirts and by using insect repellents that contain DEET or Picaridin. More information about these and other recommended repellents can be found in the fact sheet "Updated Information Regarding Insect Repellents" at [www.cdc.gov/nicdod/divbid/westnile/RepellentUpdates.htm](http://www.cdc.gov/nicdod/divbid/westnile/RepellentUpdates.htm).

**Avoid unstable buildings and structures.** Stay away from damaged buildings or structures until they have been examined and certified as safe by a building inspector or other government authority. Leave immediately if you hear shifting or unusual noises that signal that the structure is about to fall.

**Beware of wild or stray animals.** Avoid wild or stray animals. Call local authorities to handle animals. Get rid of dead animals according to local guidelines.

**Beware of electrical and fire hazards.** NEVER touch a fallen power line. Call the power company to report fallen power lines. Avoid contact with overhead power lines during cleanup and other activities. If electrical circuits and equipment have gotten wet or are in or near water, turn off the power at the main breaker or fuse on the service panel. Do not turn the power back on until electrical equipment has been inspected by a qualified electrician. Do not burn candles near flammable items or leave the candle unattended. If possible, use flashlights or other battery-operated lights instead of candles.

**Beware of hazardous materials.** Wear protective clothing and gear (for example, a respirator if needed) when handling hazardous materials. Wash skin that may have come in contact with hazardous chemicals. Contact local authorities if you are not sure about how to handle or get rid of hazardous materials.

**Clean up and prevent mold growth.** Clean up and dry out the building quickly (within 24 to 48 hours). Open doors and windows. Use fans to dry out the building. To *prevent* mold growth, clean wet items and surfaces with detergent and water. To *remove* mold growth, wear rubber gloves, open windows and doors, and clean with a bleach solution of 1 cup of bleach in 1 gallon of water. Throw away porous items (for example, carpet and upholstered furniture) that cannot be dried quickly. Fix any leaks in roofs, walls, or plumbing.

**Pace yourself and get support.** Be alert to physical and emotional exhaustion or strain. Set priorities for cleanup tasks, and pace the work. Try not to work alone. Don't get exhausted. Ask your family members, friends, or professionals for support. If needed, seek professional help.

**Prevent musculoskeletal injuries.** Use teams of two or more people to move bulky objects. Avoid lifting any material that weighs more than 50 pounds (per person).

**Stay cool.** When it's hot, stay in air-conditioned buildings; take breaks in shaded areas or in cool rooms; drink water and nonalcoholic fluids often; wear lightweight, light-colored, loose-fitting clothing; and do outdoor activities during cooler hours.

**Treat wounds.** Clean out all open wounds and cuts with soap and clean water. Apply an antibiotic ointment. Contact a doctor to find out whether more treatment is needed (such as a tetanus shot). If a wound gets red, swells, or drains, seek immediate medical attention.

**Wash your hands.** Use soap and water to wash your hands. If water isn't available, you can use alcohol-based products made for washing hands.

**Wear protective gear for cleanup work.** Wear hard hats, goggles, heavy work gloves, and watertight boots with steel toes and insoles (not just steel shank). Wear earplugs or protective headphones to reduce risk from equipment noise.

### *A special note on Trench foot or Immersion foot*

#### **What is trench foot?**

Trench foot, also known as immersion foot, occurs when the feet are wet for long periods of time. It can

be quite painful, but it can be prevented and treated.

#### **What are the symptoms of trench foot?**

Symptoms of trench foot include a tingling and/or itching sensation, pain, swelling, cold and blotchy skin,

numbness, and a prickling or heavy feeling in the foot. The foot may be red, dry, and painful after it

becomes warm and blisters may form, followed by skin and tissue dying and falling off.

In severe cases

untreated trench foot can involve the toes, heels, or the entire foot.

#### **How is trench foot prevented and treated?**

When possible, air dry and elevate your feet, and exchange wet shoes and socks for dry ones to help prevent the development of trench foot.

Treatment for trench foot is similar to the treatment for frostbite. Take the following steps:

- Thoroughly clean and dry your feet.
- Put on clean, dry socks daily.
- Treat the affected part by applying warm packs or soaking in warm water (102° to 110° F) for approximately 5 minutes.
- When sleeping or resting, do not wear socks.
- Obtain medical assistance as soon as possible.

If you have a foot wound your feet may be more prone to infection. Check your feet at least once a

day for infections or worsening of symptoms.

# Electrical Hazards

## *Protect yourself from electrical hazards follow a natural disaster*

- *Never* touch a fallen power line. Call the power company to report fallen power lines.
- Avoid contact with overhead power lines during cleanup and other activities.
- Do not drive through standing water if downed powerlines are in the water.
- If a powerline falls across your car while you are driving, stay inside the vehicle and continue to drive away from the line. If the engine stalls, do not turn off the ignition. Warn people not to touch the car or the line. Call or ask someone to call the local utility company and emergency services. Do not allow anyone other than emergency personnel to approach your vehicle.
- If electrical circuits and electrical equipment have gotten wet or are in or near water, turn off the power at the main breaker or fuse on the service panel. Do not enter standing water to access the main power switch. Call an electrician to turn it off.
- Never turn power on or off yourself or use an electric tool or appliance while standing in water. Do not turn the power back on until electrical equipment has been inspected by a qualified electrician. All electrical equipment and appliances must be completely dry before returning them to service. Have a certified electrician check these items if there is any question.
- If you see frayed wiring or sparks when you restore power, or if there is an odor of something burning but no visible fire, you should immediately shut off the electrical system at the main circuit breaker.
- Consult your utility company about using electrical equipment, including power generators. Do not connect generators to your home's electrical circuits without the approved, automatic-interrupt devices. If a generator is on line when electrical service is restored, it can become a major fire hazard and it may endanger line workers helping to restore power in your area.

### **If you believe someone has been electrocuted take the following steps:**

1. Look first. Don't touch. The person may still be in contact with the electrical source. Touching the person may pass the current through you.
2. Call or have someone else call 911 or emergency medical help.
3. Turn off the source of electricity if possible. If not, move the source away from you and the affected person using a nonconducting object made of cardboard, plastic or wood.
4. Once the person is free of the source of electricity, check the person's breathing and pulse. If either has stopped or seems dangerously slow or shallow, begin cardiopulmonary resuscitation (CPR) immediately.
5. If the person is faint or pale or shows other signs of shock, lay him or her down with the head slightly lower than the trunk of the body and the legs elevated.

6. Don't touch burns, break blisters, or remove burned clothing. Electrical shock may cause burns inside the body, so be sure the person is taken to a doctor.

# Carbon Monoxide Poisoning

*Carbon monoxide (CO) is an odorless, colorless gas that can cause sudden illness and death if inhaled.*

When power outages occur during emergencies such as hurricanes or winter storms, the use of alternative sources of fuel or electricity for heating, cooling, or cooking can cause CO to build up in a home, garage, or camper and to poison the people and animals inside.

*Every year, more than 500 people die in the U. S. from accidental CO poisoning.*

CO is found in combustion fumes, such as those produced by small gasoline engines, stoves, generators, lanterns, and gas ranges, or by burning charcoal and wood. CO from these sources can build up in enclosed or partially enclosed spaces. People and animals in these spaces can be poisoned and can die from breathing CO.

## *How to Recognize CO Poisoning*

Exposure to CO can cause loss of consciousness and death. The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. People who are sleeping or who have been drinking alcohol can die from CO poisoning before ever having symptoms.

## *Important CO Poisoning Prevention Tips*

- Never use a gas range or oven to heat a home.
- Never use a charcoal grill, hibachi, lantern, or portable camping stove inside a home, tent, or camper.
- Never run a generator, pressure washer, or any gasoline-powered engine inside a basement, garage, or other enclosed structure, even if the doors or windows are open, unless the equipment is professionally installed and vented. Keep vents and flues free of debris, especially if winds are high. Flying debris can block ventilation lines.
- Never run a motor vehicle, generator, pressure washer, or any gasoline-powered engine outside an open window, door, or vent where exhaust can vent into an enclosed area.
- Never leave the motor running in a vehicle parked in an enclosed or partially enclosed space, such as a garage.
- If conditions are too hot or too cold, seek shelter with friends or at a community shelter.
- If CO poisoning is suspected, consult a health care professional right away.

## Disinfecting Wells

If you suspect that your well may be contaminated, contact your local or state health department for specific advice.

*IMPORTANT: Fuel and other chemical releases and spills are common during flood events. If your water smells like fuel or has a chemical odor, contact your local or state health department to request a chemical analysis of your water before using it. Until you know the water is safe, use bottled water or some other safe supply of water.*

### Safety Precautions

You will need to clear hazards away from wells before cleaning and disinfecting wells after floods and other natural disasters. The following precautions will help you do that safely:

1. Before beginning any action, carefully inspect the area around the well for electrical and physical hazards. Those may include broken power lines on the ground or in the water; sharp metal, glass, or wood debris; open holes; and slippery conditions.
2. Wear thick rubber-soled shoes or boots to protect against electrical shock.
3. Turn off all power to the well area before clearing debris. Inspect all electrical connections for breaks in insulation and for moisture. Turn power back on only if all connections appear unbroken and dry with no opportunity for shock.
4. Do not turn on any electrical equipment if there is a persistent smell of fuel such as gasoline coming from the well head. Allow the well to vent. If the smell persists, contact your local or state health department. Do not continue with disinfection of the well until the contamination in the well has been removed.
5. Before beginning work on the well, clear debris away from it to avoid inadvertently moving debris into the well.
6. When clearing debris from large-diameter wells (36 inches [approximately 90 centimeters (cm)] or greater), use grappling hooks, nets, and long-handled scoops to remove debris. Do not enter the well pit. Gases and vapors can build up in well pits, creating a hazardous environment.

*Follow these additional precautions as you prepare to disinfect the wells:*

- Chlorine solutions can cause chemical burns. Use rubber gloves, protective eye wear, and waterproof aprons or rain gear when working with chlorine solutions.
- When mixing and handling chlorine solutions, work in well ventilated areas and avoid breathing vapors. When working in closed spaces, use electrical fans to provide fresh air.
- Warn users not to drink or bathe in water until all the well disinfection steps have been completed and the well has been thoroughly flushed.

*Here are some general instructions for disinfecting wells that may have become contaminated by harmful microorganisms in floods or other natural disasters.*

### ***Steps to Disinfect Drilled, Bored, or Dug Wells***

Chlorination is a process of flushing your well water system with a chlorine solution to kill bacteria and other microorganisms. This process is recommended after floods and when a well has tested positive for bacteria. It is an effective method to eliminate germ contamination, but if problems exist with faulty well construction or groundwater contamination, chlorination is only a temporary solution. If contamination persists, further investigation may be needed to determine the problem.

The disinfection process can take from a few hours to a few days to complete. Make sure you store enough water to meet your household needs before you start this process.

Read the safety precaution section before starting the disinfection procedure.

#### **Disinfection Procedure**

**Step 1.** Scrub or hose off foreign material from the well curbing or casing. If the well cover was not properly sealed and flooding has occurred, sand and silt may have deposited in the well, requiring more cleaning.

**Drilled and bored wells:** Remove the well cover and thoroughly clean the well to remove all debris. Special tools or pumps may be required to remove silt and sand. Heavy deposits of silt and sand may damage well pumps if not removed before the pump is started. If sand and silt are present, remove the pump and clean it thoroughly before using.

**Dug wells:** Remove the well cover and thoroughly clean the well to remove all floating debris. If the well is lined, scrub the sides of the well with a brush and a strong solution of chlorine and water. Empty polluted water and debris from the well using buckets or pumps. If sand and silt are present, remove the pump and clean it thoroughly before using. Rinse well walls by pouring water along the edges. Empty polluted rinse water from the well again, then allow it to refill.

*Caution:* In areas without electrical power, a portable generator may be needed to operate pumps and equipment. Read the safety instructions before turning on a generator, pumps, or any electrical equipment.

**Step 2.** Pump or bail water out of the well until the water is clear. If you have a low-yield well, empty at a slower rate. If available, use outside faucets to drain water from the well. Do not pump contaminated water into any existing pressure tank. Instead, disconnect piping between the pressure tank and pump to allow contaminated water to flow away from the well and tank.

**Step 3.** Using the table below, calculate the amount of bleach granules or unscented liquid to use. To determine the exact amount, find the corresponding well diameter in the left column. Then match the amount of bleach needed for the amount of time the concentration will remain in the well. Multiply the amount of bleach needed by every 10 feet of water in the well.

For example, a well 8 inches in diameter requires 3½ fluid ounces of unscented bleach (for a retention time of 8 hours at 50 parts per million [ppm]) per 10 feet of water. If the water in the well is 30 feet deep, multiply 3½ fluid ounces by 3 to determine the amount of bleach required (3½ x 3 = 11.5 fluid ounces). In a clean bucket, add this total amount of bleach to about 5 gallons of water (or mix this in 5 gallons of water).

If you are unsure about the depth of your well, check the well head and casing to see if a tag indicates the well depth. If a tag is not available, contact neighbors to see if they know the depths of their wells. Well depths are usually similar in neighborhoods. If you are still unable to determine the depth of your well, make your best educated guess, then increase the suggested amounts of chlorine by 50%. *Système International d'Unités (metric)*: A well 20.0 cm (8 inches) in diameter requires roughly 103.5 milliliters (mL) of unscented bleach per 3 meters of water. If the water in the well is approximately 9.1 meters deep, multiply 103.5 mL by 3 to determine the amount of bleach required (103.5 X 3 = 310.5 mL). In a clean bucket, add this total amount of bleach to about 19 liters of water.

- Step 4.** Pour the chlorine solution in the well in a circular pattern to ensure contact with all sides of the casing or lining of the well. If bored and dug wells have no casing or lining, pour the solution down the center of the well hole. If possible, recirculate the water by connecting a garden hose to an outside faucet and place the other end in the well. Allow water to run for approximately 15 minutes to ensure the chlorine solution is mixed in the well.
- Step 5.** For wells connected to a plumbing system, open all inside and outside faucets and pump water until you notice a strong odor of chlorine at each faucet. If you do not smell chlorine after running all faucets for 15 minutes, increase the amount of chlorine by one-half of the original amount used and repeat the procedures. Stop the pump and allow the chlorine solution to remain in the well and plumbing system. Refer to the table in the “Sampling After Disinfection” section to match amounts of chlorine solution and disinfection times. It is preferable for the solution to remain in the well for 8 hours or overnight, if possible. Do not leave chlorine in wells more than 24 hours because it may affect some pump parts.
- Step 6.** After the disinfectant has set in the well for the recommended period, turn on the pump, attach a hose to an outside faucet, and direct the water to a designated area away from the well. The water in the well contains high concentrations of chlorine that can be harmful to plants, septic tanks, and streams. Empty the water in an area where plants or streams will not be harmed. Continue running the water until the chlorine odor disappears, then drain the remainder of bleach in the plumbing system from the inside faucets. With low-yield wells, empty plumbing at a slower rate to avoid over pumping. Some wells may require that you stop for periods to allow the well to refill. Depending on the depth and size of the well, this process may take hours to a day or longer. Water from wells with no plumbing system can simply be pumped or removed in buckets until the chlorine odor disappears.

## Sampling After Disinfection

Until water has been tested, any water for human consumption should be boiled (roiling boil for 1 minute), or an alternative water source used. Wait at least 2 days after disinfection to ensure that the chlorine has been thoroughly flushed from the system. Then sample the water for total coliform and either *E. coli* or fecal coliform bacteria to confirm that the water is safe to drink. Contact the local health department to have your water sampled and tested or contact your state laboratory certification officer to find a certified lab near you. You can also get this number from the U.S. Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791 or [www.epa.gov/safewater/labs/index.html](http://www.epa.gov/safewater/labs/index.html)).

If the sample results show no presence of both total coliform and *E. coli* or fecal coliforms, the water can be considered safe to drink from a microbial standpoint. Follow up with two additional samples, one in the next 2 to 4 weeks and another in 3 to 4 months. To check the safety of your water over the long term, continue to monitor bacterial quality at least twice per year or more often if you suspect any changes in your water quality. If sample results indicate the presence of total coliform and *E. coli* or fecal coliforms, repeat the well disinfection process and resample. If tests continue to show the presence of bacteria, contact your local health department for assistance.

Inside Diameter of Well Casing (Standard/SI)	Amount of Chlorine Needed Per 10 Feet (3.1 Meters) of Water in Well*					
	Amount of 5.25% Sodium hypochlorite (Unscented Laundry Bleach) Standard/SI		Amount of 65% Calcium Hypochlorite (Chlorine Granules) Standard/SI			
	<i>Disinfection time for concentration of disinfectant</i>					
	100 ppm for 2 hours	50 ppm for 8 hours	25 ppm for 24 hours	100 ppm for 2 hours	50 ppm for 8 hours	25 ppm for 24 hours
1¼ inches or 3.18 cm		⅛ fluid ounces or 3.7 mL	¾ teaspoon or 3.7 mL	1/3 teaspoon or 3 mL		Not practical to use chlorine granules for these small-diameter well casings
2 inches or 5.08 cm		½ fluid ounces or 14.79 mL		¼ fluid ounces or 7.39 mL	⅛ fluid ounces or 3.7 mL	
3 inches or 7.62 cm		1 fluid ounces or 29.57 mL		½ fluid ounces or 14.79 mL	¼ fluid ounces or 7.39 mL	
4 inches or 10.16 cm		1½ fluid ounces or 44.36 mL		¾ fluid ounces or 22.18 mL	⅜ fluid ounces or 11.09 mL	
6 inches or 15.24 cm	4 fluid ounces or 118.29 mL	2 fluid ounces or 59.15 mL	1 fluid ounces or 29.57 mL	¼ ounce or 7.09 grams	⅛ ounce or 3.54 grams	1/16 ounce or 1.77 grams

8 inches or 20.32 cm	7 fluid ounces or 118.29 mL	3½ fluid ounces or 103.51 mL	1¾ fluid ounces or 51.75 mL	½ ounce or 14.17 grams	¼ ounce or 7.09 grams	⅛ ounce or 3.54 grams
10 inches or 25.40 cm	10 fluid ounces or 295.74 mL	5 fluid ounces or 146.87 mL	2 fluid ounces or 59.15 mL	¾ ounce or 21.26 grams	⅜ ounce or 10.63 grams	3/16 ounce or 5.32 grams
12 inches or 30.48 cm	2 cups or 473.18 mL	1 cup or 236.59 mL	½ cup or 118.29	1 ounce or 28.35 grams	½ ounce or 14.17 grams	¼ ounce or 7.09 grams
18 inches or 25.72 cm	4½ cups or 1.06 L	2¼ cups or 532.32 mL	1⅛ cups or 266.16 mL	2½ ounces or 70.87 grams	1¼ ounces or 35.44 grams	¾ ounces or 21.26 grams
2 feet or 60.96 cm	7½ cups or 1.77 L	3¾ cups or 887.21 mL	1⅞ cups or 443.60 mL	4½ ounces or 127.57 grams	2¼ ounces or 63.79 grams	1⅛ ounces or 31.89 grams
3 feet or 91.44 cm	17½ cups or 4.14 L	8¾ cups or 7.01 L	4⅜ cups or 1.04 L	10 ounces or 283.5 grams	5 ounces or 141.75 grams	2½ ounces or 70.87 grams

September 1, 2005 \*Notes: 1 heaping tablespoon of 65% chlorine powder=½ ounces; 8 fluid ounces=1 cup. cm=centimeter; L=liter; mL=milliliter; ppm=parts per million; SI=Système International d'Unités (metric).

## Disinfection Issues and Concerns

Bored and dug wells can be difficult to disinfect because of how they are constructed. Many are shallow and have no lining or casing, which can allow contaminants to enter the well hole from upper soil levels. If contamination problems continue, consider upgrading the existing well or drilling a new well.

Water softeners may be damaged by the disinfection process because of the large amounts of chlorine used. Follow your manufacturers' instructions for appropriate methods to disinfect your softener unit. You may need to bypass the unit until the disinfection process is complete.

# Sewage and Septic Systems

## *Where can I find information on my septic system?*

Please contact the Pike County General Health District for additional assistance. For more information on onsite/decentralized wastewater systems, call the National Environmental Services Center at (800) 624-8301 or visit their website at [www.nesc.wvu.edu](http://www.nesc.wvu.edu).

## *Do I pump my tank during flooded or saturated drainfield conditions?*

No! At best, pumping the tank is only a temporary solution. Under worst conditions, pumping it out could cause the tank to try to float out of the ground and may damage the inlet and outlet pipes. The best solution is to plug all drains in the basement and drastically reduce water use in the house.

## *What if my septic system has been used to dispose wastewater from my business (either a home-based or small business)?*

In addition to raw sewage, small businesses may use their septic system to dispose of wastewater containing chemicals. If your septic system that receives chemicals backs up into a basement or drain field take extra precautions to prevent skin, eye and inhalation contact. The proper clean-up depends of what chemicals are found in the wastewater. Contact your State or EPA for specific clean-up information.

## *What do I do with my septic system after the flood?*

Once floodwaters have receded, there are several things homeowners should remember:

- Do not use the sewage system until water in the soil absorption field is lower than the water level around the house.
- Have your septic tank professionally inspected and serviced if you suspect damage. Signs of damage include settling or an inability to accept water. Most septic tanks are not damaged by flooding since they are below ground and completely covered. However, septic tanks and pump chambers can fill with silt and debris, and must be professionally cleaned. If the soil absorption field is clogged with silt, a new system may have to be installed.
- Only trained specialists should clean or repair septic tanks because tanks may contain dangerous gases. Contact your health department for a list of septic system contractors who work in your area.
- If sewage has backed up into the basement, clean the area and disinfect the floor. Use a chlorine solution of a half cup of chlorine bleach to each gallon of water to disinfect the area thoroughly.
- Pump the septic system as soon as possible after the flood. Be sure to pump both the tank and lift station. This will remove silt and debris that may have washed into the system. Do not pump the tank during flooded or saturated drainfield conditions. At best, pumping the tank is only a temporary solution. Under worst conditions, pumping it out could cause the tank to try to float out of the ground and may damage the inlet and outlet pipes.

- Do not compact the soil over the soil absorption field by driving or operating equipment in the area. Saturated soil is especially susceptible to compaction, which can reduce the soil absorption field's ability to treat wastewater and lead to system failure.
- Examine all electrical connections for damage before restoring electricity.
- Be sure the septic tank's manhole cover is secure and that inspection ports have not been blocked or damaged.
- Check the vegetation over your septic tank and soil absorption field. Repair erosion damage and sod or reseed areas as necessary to provide turf grass cover.

**Remember: Whenever the water table is high or your sewage system is threatened by flooding there is a risk that sewage will back up into your home. The only way to prevent this backup is to relieve pressure on the system by using it less.**

- Use common sense. If possible, don't use the system if the soil is saturated and flooded. The wastewater will not be treated and will become a source of pollution. Conserve water as much as possible while the system restores itself and the water table falls.
- Prevent silt from entering septic systems that have pump chambers. When the pump chambers are flooded, silt has a tendency to settle in the chambers and will clog the drainfield if it is not removed.
- Do not open the septic tank for pumping while the soil is still saturated. Mud and silt may enter the tank and end up in the drainfield. Furthermore, pumping out a tank that is in saturated soil may cause it to "pop out" of the ground. (Likewise, recently installed systems may "pop out" of the ground more readily than older systems because the soil has not had enough time to settle and compact.)
- Do not dig into the tank or drainfield area while the soil is still wet or flooded. Try to avoid any work on or around the disposal field with heavy machinery while the soil is still wet. These activities will ruin the soil conductivity.
- Flooding of the septic tank will have lifted the floating crust of fats and grease in the septic tank. Some of this scum may have floated and/or partially plugged the outlet tee. If the septic system backs up into the house check the tank first for outlet blockage. Clean up any floodwater in the house without dumping it into the sink or toilet and allow enough time for the water to recede. Floodwaters from the house that are passed through or pumped through the septic tank will cause higher flows through the system. This may cause solids to transfer from the septic tank to the drainfield and will cause clogging.
- Locate any electrical or mechanical devices the system may have that could be flooded to avoid contact with them until they are dry and clean.
- Aerobic plants, upflow filters, trickling filters, and other media filters have a tendency to clog due to mud and sediment. These systems will need to be washed and raked.

**In the aftermath of a flood, most communities will provide portable toilets, but these may be limited. If no toilet facilities are available, deposit body waste in a water-tight receptacle used for that purpose only. Place a small amount of water in the receptacle before it is used to make emptying easier. Dig a trench or pit and empty the contents of the receptacle into this pit as soon as possible after each use. Cover the waste in the trench after each use with a thin layer of dirt, ashes or lime. Also, empty the water used to wash the receptacle into the pit or trench. When closing the trench, cover it with at least 12 inches of earth.**

# Mold Safety

## Protect Yourself from Mold

After natural disasters such as hurricanes, tornadoes, and floods, excess moisture and standing water contribute to the growth of **mold** in homes and other buildings. When returning to a home that has been flooded, be aware that mold may be present and may be a health risk for your family.

### People at Greatest Risk from Mold

People with asthma, allergies, or other breathing conditions may be more sensitive to mold. People with immune suppression (such as people with HIV infection, cancer patients taking chemotherapy, and people who have received an organ transplant) are more susceptible to mold infections.

### Possible Health Effects of Mold Exposure

People who are sensitive to mold may experience stuffy nose, irritated eyes, wheezing, or skin irritation. People allergic to mold may have difficulty in breathing and shortness of breath. People with weakened immune systems and with chronic lung diseases, such as obstructive lung disease, may develop mold infections in their lungs. If you or your family members have health problems after exposure to mold, contact your doctor or other health care provider.

### Recognizing Mold

You *may* recognize mold by:

- **Sight** (Are the walls and ceiling discolored, or do they show signs of mold growth or water damage?)
- **Smell** (Do you smell a bad odor, such as a musty, earthy smell or a foul stench?)

### Safely Preventing Mold Growth

Clean up and dry out the building quickly (within 24 to 48 hours). Open doors and windows. Use fans to dry out the building

• **When in doubt, take it out!** Remove all porous items that have been wet for more than 48 hours and that cannot be thoroughly cleaned and dried. These items can remain a source of mold growth and should be removed from the home. Porous, noncleanable items include carpeting and carpet padding, upholstery, wallpaper, drywall, floor and ceiling tiles, insulation material, some clothing, leather, paper, wood, and food. **Removal and cleaning are important because even dead mold may cause allergic reactions in some people.**

- To *prevent* mold growth, clean wet items and surfaces with detergent and water.
- Homeowners may want to temporarily store items outside of the home until insurance claims can be filed. See recommendations by the Federal Emergency Management Agency (FEMA) at [www.fema.gov/hazards/floods/whatshouldidoafter.shtm](http://www.fema.gov/hazards/floods/whatshouldidoafter.shtm).
- If you wish to disinfect, refer to the U.S. Environmental Protection Agency (EPA) document, *A Brief Guide to Mold and Moisture in Your Home* at [www.epa.gov/iaq/molds/images/moldguide.pdf](http://www.epa.gov/iaq/molds/images/moldguide.pdf).

**If there is mold growth in your home, you should clean up the mold *and* fix any water problem, such as leaks in roofs, walls, or plumbing.** Controlling moisture in your home is the most critical factor for preventing mold growth.

To *remove* mold growth from hard surfaces use commercial products, soap and water, or a bleach solution of no more than 1 cup of bleach in 1 gallon of water. Use a stiff brush on rough surface materials such as concrete.

If you choose to use bleach to remove mold:

- Never mix bleach with ammonia or other household cleaners. Mixing bleach with ammonia or other cleaning products will produce dangerous, toxic fumes.
- Open windows and doors to provide fresh air.
- Wear non-porous gloves and protective eye wear.
- If the area to be cleaned is more than 10 square feet, consult the U.S.

Environmental Protection Agency (EPA) guide titled *Mold Remediation in Schools and Commercial Buildings*. Although focused on schools and commercial buildings, this document also applies to other building types. You can get it free by calling the EPA Indoor Air Quality Information Clearinghouse at (800) 438-4318, or by going to the EPA web site at [www.epa.gov/mold/mold\\_remediation.html](http://www.epa.gov/mold/mold_remediation.html).

- Always follow the manufacturer's instructions when using bleach or any other cleaning product.

If you plan to be inside the building for a while or you plan to clean up mold, you should buy an N95 mask at your local home supply store and wear it while in the building. Make certain that you follow instructions on the package for fitting the mask tightly to your face. If you go back into the building for a short time and are not cleaning up mold, you do not need to wear an N95 mask.

## Animal Hazards

- Avoid wild or stray animals.
- Call local authorities to handle animals.
- Secure all food sources and remove any animal carcasses to avoid attracting rats.
- Get rid of dead animals, according to guidelines from your local animal control authority, as soon as you can.
- For guidance on caring for animals entering shelters and for people working with or handling animals following an emergency, see “Interim Guidelines for Animal Health and Control of Disease Transmission in Pet Shelters” ([www.bt.cdc.gov/disasters/hurricanes/katrina/animalhealthguidelines.asp](http://www.bt.cdc.gov/disasters/hurricanes/katrina/animalhealthguidelines.asp)).
- For more information, contact your local animal shelter or services, a veterinarian, or the Humane Society for advice on dealing with pets or stray or wild animals after an emergency.

### *Mosquitoes*

- Rain and flooding in a hurricane area may lead to an increase in numbers of mosquitoes, which can carry diseases, such as West Nile virus or dengue fever. In most cases, the mosquitoes will be pests but will not carry communicable diseases. Local, state, and federal public health authorities will be actively working to control the spread of any mosquito-borne diseases. For more information on West Nile virus, see CDC’s West Nile virus website ([www.cdc.gov/westnile](http://www.cdc.gov/westnile)).
- To protect yourself from mosquitoes, use screens on dwellings; wear long pants, socks, and long-sleeved shirts; and use insect repellents that contain DEET or Picaridin. Follow directions on the product label and take care when using DEET on small children. More information about these and other recommended repellents can be found in the fact sheet “Updated Information Regarding Insect Repellents” ([www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm](http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm)).
- To help control mosquito populations, drain all standing water left outdoors in open containers, such as flower pots, tires, pet dishes, or buckets.

### *Rodents*

#### **Rodent Control After a Disaster**

Rats and mice are destructive pests that can spread disease, contaminate food, and destroy property. However, as a result of a disaster, the number of rats and mice are often reduced. Thus, illness associated with rats and other small rodents is uncommon immediately after a disaster.

Surviving rodents often relocate to new areas in search of food, water, and shelter. As the rodents settle into new areas, they will build colonies and reproduce. Typically, it takes 6 to 10 months for rodents to re-establish their colonies after a disaster. As the rodent population grows and resettles, people have a greater chance of being exposed to the diseases carried by rodents.

The following recommendations are designed to help residents reduce the risk of disease or personal injury associated with rodents.

### **Precautions to Limit Household Exposure**

Removing food sources, water, and items that provide shelter for rodents is the best way to prevent contact with rodents. Where necessary, control rodents by using an integrated pest management approach that includes environmental sanitation, food storage, rodent-proofing, poisoning, and trapping.

#### ***Inside the Home***

- Keep food and water covered and stored in rodent-proof containers. A rodent-proof container is made of thick plastic, glass, or metal and has a tight-fitting lid.
- Keep pet food covered and stored in rodent-proof containers. Allow pets only enough food for each meal, then store or discard any remaining food. Do not leave excess pet food or water out overnight.
- Dispose of garbage on a frequent and regular basis. If storing trash and food waste inside the home, do so in rodent-proof containers.
- Wash dishes, pans, and cooking utensils immediately after use.
- Remove leftover food and clean up any spilled food from cooking and eating areas.
- Do not store empty cans or other opened containers with food residues inside the home.
- When possible, use spring-loaded traps in the home. Use a small amount of chunky peanut butter as bait. Place traps in a “T” shape against baseboards or wall surfaces where rodent rub marks, droppings, or rodents have been seen. Keep children and pets away from areas where traps are placed.
- Glue traps and live traps are not recommended. Rodents caught in live traps will likely reenter the dwelling. Glue traps can scare mice that are caught live and cause them to urinate. This may increase your risk of being exposed to diseases.

#### ***Outside the Home***

- Dispose of debris and trash as soon as possible. Woodpiles and stacks of lumber or other materials to be saved for later use should be stored at least 12 inches above the ground and as far away from the home as possible.
- Store garbage in rodent-proof containers with tight fitting lids.
- Store grains and animal feed in rodent-proof containers.
- Remove any food sources, including animal carcasses, which might attract rodents.
- Haul away trash, abandoned vehicles, discarded tires, and other items that might serve as rodent nesting sites.
- Keep grass short and cut or remove brush and dense shrubbery that may provide rodents cover and protection. Trim the limbs off any trees or shrubs that overhang or touch buildings.
- Place spring-loaded traps in outbuildings and in other areas where signs of rodents are found. Do not allow children or pets to play near spring traps.

#### ***Rodent-Proofing Your Home***

Seal gaps and holes inside and outside the home that are greater than a ¼-inch diameter with any of the following materials: cement, light-gauge metal mesh, wire screening, hardware cloth, steel wool, caulk, expanding foam, or other patching materials.

### **Cleanup of Rodent-Contaminated Areas or Dead Rodents**

Thoroughly clean areas with signs of rodent activity to reduce the likelihood of exposure to germs and diseases. When cleaning, it is important that you do not stir dust when sweeping or vacuuming up droppings, urine, or nesting materials.

#### ***Cleanup of Contaminated Surfaces***

- Wear rubber, latex, vinyl, or nitrile gloves if you touch dead rodents, traps, or rodent droppings.
- Spray rodent urine or droppings with a disinfectant or a 1:10 chlorine solution (1 part bleach to 10 parts water) until thoroughly soaked. Use a paper towel to pick up the urine and the droppings and discard it outdoors in a sealed container.
- Do not vacuum or sweep rodent urine, droppings, or contaminated surfaces unless they have been disinfected.
- After the rodent droppings and urine have been removed, disinfect items that might have been contaminated.

#### ***Cleanup of Dead Rodents***

- Check traps regularly.
- Spray dead rodents with a disinfectant or chlorine solution.
- While wearing gloves, take the rodent out of the trap by lifting the spring-loaded metal bar and letting the animal fall into a plastic bag or place the entire trap containing the dead rodent into a plastic bag, and seal the bag. Then place the rodent into a second plastic bag and seal it. Promptly dispose of the rodent in the sealed double bag.
- After removing gloves, thoroughly wash hands with soap and water (or use a waterless alcohol-based hand gel when soap and water are not available and hands are not visibly soiled).
- If the trap will be reused, decontaminate it by immersing and washing it in a disinfectant or chlorine solution and rinsing well afterwards.
- Continue trapping for at least 1 additional week after the last rodent is caught.
- If rodents continue to be a problem, consider contacting a professional pest control operator for help.

## ***Snakes***

After a natural disaster, snakes may have been forced from their natural habitats and move into areas where they would not normally be seen or expected. When you return to your home, be cautious of snakes that may have sought shelter in your home. If you see a snake in your home, immediately call the animal control agency in your county.

### **How to prevent snake bites**

- Be aware of snakes that may be swimming in the water to get to higher ground and those that may be hiding under debris or other objects.
- If you see a snake, back away from it slowly and do not touch it.

## **Signs of Snake Bites**

If you have to walk in high water, you may feel a bite, but not know that you were bitten by a snake. You may think it is another kind of bite or scratch. Pay attention to the following snake bite signs.

Depending on the type of snake, the signs and symptoms may include:

- A pair of puncture marks at the wound
- Redness and swelling around the bite
- Severe pain at the site of the bite
- Nausea and vomiting
- Labored breathing (in extreme cases, breathing may stop altogether)
- Disturbed vision
- Increased salivation and sweating
- Numbness or tingling around your face and/or limbs

## **What To DO if You or Someone Else is Bitten by a Snake**

- If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep the bitten person still and calm. This can slow down the spread of venom if the snake is poisonous.
- Seek medical attention as soon as possible.
- Dial 911 or call local Emergency Medical Services (EMS).
- Apply first aid if you cannot get the person to the hospital right away.
  - Lay or sit the person down with the bite below the level of the heart.
  - Tell him/her to stay calm and still.
  - Cover the bite with a clean, dry dressing.

## **What NOT To Do if You or Someone Else is Bitten by a Snake**

- Do not pick up the snake or try to trap it (this may put you or someone else at risk for a bite).
- Do not apply a tourniquet.
- Do not slash the wound with a knife.
- Do not suck out the venom.
- Do not apply ice or immerse the wound in water.
- Do not drink alcohol as a pain killer.
- Do not drink caffeinated beverages.

## ***Animal Disposal Following an Emergency***

Most states have their own guidelines on disposal of dead animals, so people with questions regarding the specific situation in their state are highly encouraged to contact local or state health and agricultural officials for clarification.

### ***Frequently Asked Questions***

#### **Are there any special health risks I need to be aware of when disposing of dead animals?**

The risk to humans from animal carcasses is low if proper precautions are taken.

- Practice proper hand washing to prevent infection with certain pathogens that may be transmitted from farm animals, including *Salmonella* and *E. coli*.
- Secure all food sources and remove any animal carcasses to avoid attracting rats.
- Wear insect repellent when outdoors. Emergencies such as natural disasters may lead to more mosquitoes, which can carry disease.

People working to clean up areas containing swine or poultry carcasses should take the following precautions:

- Wear protective clothing, including waterproof gloves, waterproof boots, and protective eyewear (cover any open wounds).
- Use duct tape to seal tops of gloves and boots to prevent water seepage.
- Wear respiratory protection—an N-95 respirator or better.
- If you smell hydrogen sulfide (a rotten egg smell), get out of the building and call your county extension office.
- Clean and disinfect all clothing and boots after handling carcass-contaminated materials.
- Wash work clothes separately from street clothes.
- Wash hands thoroughly before placing fingers in mouth (nail biting, etc.).
- Shower and wash hair thoroughly after handling carcass-contaminated materials.

#### **How do I dispose of a dead animal on my property during flood cleanup?**

It is usually the responsibility of the owner or person in charge of domesticated animals to appropriately dispose of dead animals in accordance with local or state ordinances within 24 hours after knowledge of the death. It can be the responsibility of the municipal or county government to designate appropriate people to dispose of any domestic dead animals whose owner cannot be identified.

#### **My pet was killed in the flood. Can I bury it on my property?**

Several cities require Animal Care and Control agencies to manage the disposal of family pets and other dead animals, except for livestock. Check with your local authorities for more information.

**If not, how do I dispose of the remains?**

1. Wear gloves.
2. Cover your gloved hand with a plastic trash bag, pick up the remains, then invert the trash bag over the remains and seal the bag.
3. For larger animals, use a shovel to place remains inside a plastic trash bag, then rinse off the shovel with water.
4. Call your local animal care and control agency for further instructions and to request pickup.
5. Wash your hands.

**I am a farmer and I lost a lot of livestock during the flood. How do I dispose of multiple animal remains?**

Each farm operation should have specific plans for animal disposal in the event of an emergency. Farm operations should check with state and local authorities to ensure their plan meets local requirements.

In addition, the [US Department of Agriculture \(USDA\) Animal and Plant Health Inspection Service \(APHIS\)](http://www.aphis.usda.gov/) (<http://www.aphis.usda.gov/>) can provide technical advice and assistance on the effective disposal of animal carcasses. The main phone number for the APHIS Emergency Management Staff in Riverdale, Maryland is 301-734-8073. Local phone numbers may be established in the event of an emergency response.

These guidelines are intended to address dead animal disposal during a declared emergency. They do not take the place of the dead animal disposal that occurs under the normal permitted operation of a farm.



**Public Health**  
Prevent. Promote. Protect.

*Pike County General Health District*

# Food Establishments: Interruption of Water Service Guidance

Updated March 2008

## ***I. ASSESSMENT***

In the event of an emergency involving water service interruption, appropriate food service operation responses must be taken after an assessment of multiple factors including but not limited to:

- a. The complexity and scope of food operations,
- b. The onset and duration of the emergency event,
- c. The impact on other critical infrastructure and services, and
- d. The availability of alternative procedures that can be used to meet Food Code and Food Law requirements.

A food service operation manager (or the “Person-in-Charge”) is responsible for conducting both initial and ongoing assessments to ensure consistent compliance with food safety requirements.

## ***II. RESPONSE***

The following are temporary alternative procedures that can be taken to address specific affected food operations during an extended interruption of water service.

### **Affected Operations Alternative Procedure Handwashing**

- No water to wash hands.
- Chemically treated towelettes may be used for cleaning hands if the food items offered are pre-packaged or otherwise protected from contamination by hands AND a hand washing facility is available at the alternate toilet room location.  
And/Or
- Potable water from an approved public water supply system can be heated and placed into a 5-gallon insulated container with a spigot which can be turned on to allow clean, warm water to flow over one’s hands into a sink drain.

### **Emergency Action Plan Interruption of Water Service**

Provide suitable hand cleaner, disposable towels, and a waste receptacle and

- Follow up with a hand sanitizer.
- Suspend alternative procedures for bare hand contact. Do not contact ready to eat food with bare hands.

Toilet Facilities – no water to flush toilets and urinals

- Toilet rooms that may not be conveniently located but are accessible to employees during all hours of operation, may be used until water service is restored.

Or

- Discontinue operation if toilet facilities are not available.

#### Drinking Water

- Use commercially bottled water  
And/Or
- Haul water from an approved public water supply in a covered sanitized container  
And/Or
- Arrange to use a licensed drinking water hauler truck

#### Cooking – Food Preparation

- Use commercially bottled water, water hauled from an approved public water supply in a covered sanitized container, or water from a licensed drinking water hauler truck  
And/Or
- Restrict the menu to items that don't require water.

#### Ice

- Use commercially manufactured ice

#### Post-mix Fountain Drinks

- Discontinue service

#### Cleaning/sanitizing Equipment, Utensils, Tableware, Physical Facility

- Use single service/use articles  
And/Or
- Use commercially bottled water, haul water from an approved public water supply in a covered sanitized container or water from a licensed drinking water hauler truck to clean and sanitize equipment and utensils.  
And
- Discontinue operations as inventories of clean equipment utensils, and tableware are exhausted
- Discontinue operations when cleanliness of the physical facility jeopardizes food safety

### ***III. RECOVERY***

#### **RE-OPENING / RETURNING TO NORMAL OPERATIONS CONSIDERATIONS**

A food service operation that was ordered or otherwise required to cease operations may not re-open until authorization has been granted by the regulatory authority.

After water service has been restored and after either the municipality or regulatory authority has lifted any "Boiled Water Advisory":

- Flush pipes/faucets: follow the directions of your water utility (in the newspaper, radio, or television) or, as general guidance, run cold water faucets for at least 5 minutes.

- Equipment with waterline connections such as post-mix beverage machines, spray misters, coffee or tea urns, ice machines, glass washers, dishwashers, and other equipment with water connections must be flushed, cleaned, and sanitized in accordance with manufacturer's instructions.
- Run water softeners through a regeneration cycle.
- Drain reservoirs in tall buildings.
- Flush drinking fountains: run continuously for 3 minutes.

#### *Ice Machine Sanitation*

Flush the water line to the machine inlet:

1. Close the valve on the water line behind the machine and disconnect the water line from the machine inlet.
2. Open the valve, run 5 gallons of water through the valve and dispose of the water.
3. Close the valve.
4. Reconnect the water line to the machine inlet.
5. Open the valve.

Flush the water lines in the machine:

1. Turn on the machine.
2. Make ice for 1 hour and dispose of the ice.

Clean and sanitize all parts and surfaces that come in contact with water and ice, following the manufacturer's instructions.

For the purpose of this Emergency Action Plan, an imminent health hazard exists whenever a municipality has issued a Boil Water Advisory or when an onsite water supply has exceeded the maximum contaminate level for coliform bacteria.



**Public Health**  
Prevent. Promote. Protect.

*Pike County General Health District*

# Food Establishments: Reopening after Flooding

Updated March 2008

Following a natural disaster there are potential health concerns that can be created by the disruptions caused by the disaster. This publication provides food safety suggestions and information for retail and foodservice establishments resuming business in the aftermath of natural or other disasters. Prior to reopening, establishment persons-in-charge (PICs) should conduct a complete self-inspection to ensure that normal operations can be resumed safely and without compromising food safety. Establishments required to cease operations in an emergency or those affected by a natural disaster should not re-open until authorization is granted by the local or state regulatory authority.

Do not enter a flood damaged building where there is potential for hazardous materials or gas leaks within the building, until the building has been cleared by a hazardous materials (HAZMAT) team. For exposures to mold-contaminated materials/environments, or other recognized hazards, NIOSH approved respirators may be necessary. If entering and cleaning a building, refer to [NIOSH protective equipment guidance](#).

Decontamination and sanitization procedures using chemical sanitization, e.g., chlorine bleach at a concentration of 100-200 ppm (1 tablespoon of bleach in 1 gallon of potable water), Quaternary Ammonium at a concentration of 200 ppm, or other approved sanitizers, should be used on equipment and structural surfaces that are salvageable. When you decontaminate, do so in a manner that eliminates any harmful microorganisms, chemical residues, or filth that could pose a food safety risk.

### ***Pest Control***

- Ensure that any rodents/pests that may have entered the facility are no longer present. Remove dead pests and sanitize any food-contact surfaces that have come in contact with pests.
- Seal all openings into the facility to prevent future entry of pests, or rodents.
- Dispose of contaminated or spoiled solid foods in closed containers for removal to prevent rodent and fly harborage.

### ***Damaged Food Products***

- Discard all food and packaging materials that have been submerged in flood waters, unless the food is sealed in a hermetically sealed can that has not been damaged.
  - Destroy refrigerated and frozen foods, such as meat, poultry, shell eggs, egg products, and milk, which have been immersed in flood waters. Good advice is: If in doubt, throw it out.

- Inspect canned foods and discard any food in damaged cans. Can damage is shown by swelling; leakage; punctures; holes; fractures; extensive deep rusting; or crushing/denting severe enough to prevent normal stacking or opening with a manual, wheel-type can opener.
- Do not recondition products in containers with screw-caps, snap-lids, crimped-caps (soda pop bottles), twist-caps, flip-top, snap-open, and similar type closures that have been submerged in flood waters.
- Do not salvage food packed in plastic, paper, cardboard, cloth, and similar containers that have been water damaged.
- Undamaged, commercially prepared foods in all-metal cans or retort pouches can be saved if you remove labels that can come off, thoroughly wash the cans, rinse them, and then disinfect them with a sanitizing solution consisting of 1 tablespoon of bleach per gallon of potable water. Finally, re-label containers that had the labels removed, including the expiration date, with a marker.
- Complete proper and safe disposal of condemned food items in a manner consistent with federal, state, and local solid waste storage, transportation, and disposal regulations, to ensure these products do not reappear as damaged or salvaged merchandise for human consumption.

### *Physical Facilities*

- If you have a well that has been flooded, the water should be disinfected and tested to confirm it is safe after flood waters recede. If you suspect that your well may be contaminated, contact your local or state health department or agriculture extension agent for specific advice.
- Thoroughly wash all physical facility interior surfaces (e.g., floors, walls, and ceilings), using potable water, with a hot detergent solution, rinsed free of detergents and residues, and treated with a sanitizing solution.
- Mold contamination is a concern. Structural components of the building (e.g., walls, piping, ceiling, and HVAC system/ventilation systems) affected by flood waters or other damage from the hurricane, should be cleaned, repaired, and disinfected, where possible. Remove and destroy wall board that has been water damaged. Cement walls that have mold damage can be reconditioned.
- Any exhaust systems and hoods should be thoroughly cleaned and freed of any debris. Consult professional service technicians, as needed. Water damaged ventilation systems that cannot be thoroughly cleaned and sanitized should be removed and replaced. In all cases, replace all ventilation air filters.

### *Equipment*

- Thoroughly wash metal pans, ceramic dishes, and utensils (including can openers) with soap and hot water. Rinse, and then sanitize them by boiling in potable water

or immersing them for 15 minutes in a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water or other approved sanitizer. Follow instructions on the sanitizer label for appropriate concentration.

- Thoroughly wash countertops, equipment and non-food contact surfaces with soap and hot water. Rinse, and then sanitize by applying a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water or other approved sanitizer. Allow to air dry.
- A dishwasher or 3-compartment sink should be used to wash, rinse, and sanitize equipment and utensils using potable water, and:
  - Chlorine bleach at a concentration of 50-100 ppm or other approved sanitizers should be provided for sanitizing food contact surfaces and equipment.
  - Mechanical dishwashing machines should provide a final, sanitizing rinse of either 50 ppm chlorine (for chemical sanitizing machines) or 180°F final sanitizing rinse (for hot water sanitizing machines).
  - An approved test kit should be available to ensure appropriate sanitizer strength for chemical sanitizing and a maximum registering thermometer or temperature sensitive tape should be available to check that the hot water reaches 180°F or the utensil surface reaches a temperature of 165°F.
  - Run the empty dishwasher through the wash-rinse-sanitize cycle three times to flush the water lines and assure that the dishwasher is cleaned and sanitized internally before washing equipment and utensils in it.
- Refrigerated display and storage cases and other refrigerator equipment used to store food should be cleared of all contaminated products and their juices prior to cleaning.
- Refrigerated storage equipment should be thoroughly washed inside and outside with a hot detergent solution and rinsed free of detergents and residues. (Special attention should be given to lighting, drainage areas, ventilation vents, corners, cracks and crevices, door handles and door gaskets.) Treat all clean surfaces with a sanitizing solution.
- If the insulation, door gaskets, hoses, etc. are damaged by flood or liquefied food items, then replace or discard these refrigerated display cases and storage cases and other refrigerator equipment.
- All filters on equipment should be removed and replaced if not designed to be cleaned in place.
- Replace all ice machine filters and beverage dispenser filters, and flush all water lines, including steam water lines and ice machine water lines, for 10 to 15 minutes.
- Discard all ice in ice machines; clean and sanitize the interior surfaces (ice making compartment and storage bin); run the ice through 3 cycles; and discard ice with each cycle.

- All sinks should be thoroughly cleaned and sanitized before resuming use.
- Equipment should be inspected to ensure it is operational and that all aspects of its integrity are maintained.
- Stove units should be thoroughly cleaned and checked by the fire department, local utility company, or authorized service representative prior to use.

### *Maintaining Food Temperatures*

- Verify that that all open-top and refrigerated and freezer display cases, walk-in refrigerators, and walk-in freezers are capable of consistently maintaining cold holding temperatures ( $\leq 41^{\circ}\text{F}$  or in a frozen state) before food items are placed in the units.
- Ensure that the equipment can heat to the appropriate cooking temperature hot ( $\geq 135^{\circ}\text{F}$ ) for raw animal foods and to cool to maintain potentially hazardous foods cold at the appropriate ( $\leq 41^{\circ}\text{F}$ ) temperature.
- Verify that all equipment used for food preparation (e.g., cooking, cooling, and reheating) is functioning and properly calibrated prior to use.

### *Employees*

- Put fewer items on the menu when only a limited number of trained employees are available and working. A full menu may be offered when there is an adequate number of trained employees to staff each area of the operation during normal working hours.
- Soap and potable running, warm water (at least  $100^{\circ}\text{F}$ ) should always be used to wash hands.
- Alcohol hand gels may only be used after handwashing. Alcohol hand gels are ineffective against germs on soiled hands and are therefore not a substitute for soap and water handwashing.
- Employees should not touch ready-to-eat foods with their bare hands, but instead should use tongs, deli paper, or single-use, disposable gloves.
- Remember:
  - Employees with open wounds should not work with hands-on preparation of foods or with cleaned and sanitized food contact surfaces or single-service/single-use utensils. If these infected wounds are covered with a double, water-proof barrier such as a finger cot or water-tight bandage and plastic gloves, the employee may continue to work with food.
  - Employees sick with vomiting, diarrhea or jaundice should not be working in the establishment and may not return to work until at least 24 hours after the symptoms cease.

### ***Food Source and Receipt***

- All foods, including raw, fresh, frozen, pre-packaged, shelf-stable, and ready-to-eat foods, should only be received from a licensed and an approved food source. This includes food distributors and vendors licensed by the local or state regulatory food authority.
- Food should be received by a person who is responsible for ensuring that food packages meet temperature requirements and are intact with no breaks, seams, or other openings. Canned foods should not be swollen or have any dents or punctures in the cans.
- Foods requiring temperature control should be received in a frozen state or at temperatures less than 41°F for refrigerated storage.

***The following information was obtained from The US Food and Drug Administration***