



ENVIRONMENTAL HEALTH INFORMATIONAL BULLETIN

TO: Orange County Residential and Business Owners

SUBJECT: Safety Issues, Cleaning and Restoration of Flood Ravaged Homes/Businesses

Disease transmission or illness may occur following contamination from a flood. Flooding can damage a building in many ways. Materials submerged in floodwater can decay, swell, and warp. Electrical equipment and components can corrode and may cause fires or electrical shock if not replaced after a flood. Wet surfaces encourage mold growth, which discolors surfaces, leads to odor problems, deteriorates building materials, and may cause allergic reactions in susceptible individuals. Floodwater may fracture water mains and sewer lines which may contribute to a variety of health concerns.

Following the flooding disaster, victims may be quick to repair and rebuild their homes. It is natural to want to return to "normal" as quickly as possible. Following are recommended home safety measures and cleaning methods:

- **Only enter the flooded building with caution and guidance of structural and electrical experts, if it is safe.**
- Turn off the electricity from the circuit breaker if you can get to the electric box without going through standing water. Use a flashlight, if needed, instead of turning on lights.
- Shut off gas and propane tanks. Report gas leaks to your local gas company immediately.
- Contact your insurance company to inform of damages to your home/contents. A camera can be very useful to assist in documenting the extent of the damage.
- Be sure the clean-up area is well-ventilated. A mask and latex gloves should be worn for protection when doing any clean-up or decontamination.
- Doors and windows should be opened as soon as possible to ventilate a flood-damaged building.
- Immediately clean the home of mud and silt to remove any sewage and microorganisms that may have been deposited by the floodwater.
- Clean and disinfect flooded surfaces with a solution of 5% to 10% bleach. Use the higher concentration for heavily contaminated surfaces. In all cases, repeat the treatment at least twice within a 30-minute period.
- Most types of brick will dry out and show no permanent water damage. Wood can often return to its original shape and strength when dried. Wall, floor, or ceiling insulation in contact with floodwater must be discarded.
- Wallpaper and other wall coverings inhibit drying, and should be removed and discarded if exposed to floodwater. Wet plaster cannot be easily decontaminated and should be removed and discarded.
- Water can loosen vinyl and ceramic tiles directly or through swelling of the underlayment. Most floor coverings, including the underlayment, will not survive a flood and should be replaced.
- If the house has a crawl space, all wet insulation and plastic sheeting should be removed and discarded, and the crawl space ventilated/dried with a fan if necessary.

Residential heating and cooling systems, refrigerators, water heaters, and other appliances in contact with flood-water can be extremely dangerous. For safety reasons alone, it is essential to restore

heating and cooling systems and appliances to proper operating condition, through repair or replacement, before restoring power. All salvaged appliances should be cleaned, dried, and disinfected prior to re-use.

- Electrical wiring in walls may suffer moisture damage. Most home wiring is plastic coated and reasonably waterproof, minimizing the need for replacement after a flood.
- Furnaces, space heaters, and boilers, fueled by natural gas or propane, have gas valves and controls that are especially vulnerable to water damage from floods, possibly resulting in fire or explosion. In all cases when salvaging the unit, gas valves, pilot and burner orifices, controls, and the filter must be replaced, and all remaining components thoroughly cleaned and disinfected.
- All residential heat-pump, air conditioning systems, and refrigeration circuitry are factory sealed. Floodwater repositioning the indoor or outdoor units of a split system requires major repair or full replacement. A qualified electrical or refrigeration mechanic should check all indoor and outdoor electrical and refrigeration connections, including all control circuits.
- Ovens and ranges are often salvageable. Electricity must first be disconnected, the back cover removed, water saturated insulation discarded, and the interior surfaces cleaned and disinfected. Wet controls, the pilot orifice, and valves exposed to flood water must be replaced before turning on the stove.
- Any refrigerator or freezer submerged in floodwater should be replaced.
- A clothes washing machine and dryer should be clean, dry, and disinfected, and an electrician or appliance technician should check all electrical contacts and connections prior to reuse.
- Smaller appliances like microwave ovens and TVs should be unplugged and carefully examined to determine if salvage/repair or replacement is more appropriate. If deemed salvageable, they should be cleaned, dried, and disinfected inside and out, with the electrical parts components carefully inspected.
- A gas or electric water heater exposed to flood water should generally be replaced. If no water damage is observed, flush clean water through the water heater before re-use.
- Computers and disks or tapes may be restored by a professional drying center.
- All food items, cosmetics, and medicine exposed to floodwater contamination should be discarded.
- All eating utensils should be washed, rinsed and sanitized in 100ppm of bleach for at least 30 seconds.
- Mud and dirt should be removed from clothing, linens, mattresses and upholstered furniture as soon as possible. Clothing and linens are to be washed with hot water, detergent, and a sanitizing solution, while mattresses and furniture are to be air dried in sunlight, and sprayed with a disinfectant.
- All trash, garbage, and contaminated food is to be bagged and properly disposed of as soon as possible.
- Standing water is to be eliminated to prevent fly and mosquito breeding.
- Keep informed of public water supply contamination issues. If you are unsure, use public water to hose down mud and debris, or to flush the toilet. Use bottled water for drinking. Pump private wells until the water runs clear. For additional advice, call the Water Quality Program of this office.
- Flush the toilet before use. Ask the local sanitation district if sewer lines are functioning properly. If toilets are inoperable, line the toilet with a plastic bag, tie and properly dispose of the bagged contents after use. Do not flush the toilet if you use a septic system, which is not functional after a flood.

Always assume that floodwater brings contaminants which may contain harmful bacteria and organics. There are health and safety concerns associated with home flooding, and equipment and appliances contaminated by floodwater. Decisions about salvaging or replacing damaged equipment depend on the length of time and level of flooding in the home, and the amount of insurance coverage, and assistance from flood-relief programs.

For additional sanitation safety tips contact Orange County Environmental Health at (714) 433-6000.