



# Flood Cleanup: Protecting Indoor Air Quality

Flood water can make the air in your home unhealthy. This is because when things remain wet for more than two days, they usually get moldy. Inhaling mold can cause adverse health effects, including allergic reactions. Mold also can damage materials in your home. In addition, flood water may contain microorganisms, such as bacteria, or chemicals which may affect your health. As you clean up after a flood, other substances could get into the air in your home. These include carbon monoxide, lead, asbestos, and cleaning products, which may also affect your health.

This document describes indoor air quality (IAQ) concerns that you should be aware of after a flood (such as a flash flood or flooding after a hurricane). It provides links to resources that can help you address those concerns as you and others clean up your home after a flood. Although this document talks about flooding in your home, you also could use it for other types of buildings. If your home is damaged by clean water (like pipe leak or rainwater intrusion), go to the U.S. Environmental Protection Agency's (EPA) [mold website](#) for information on mold prevention and cleanup.

## Get Ready to Clean Up

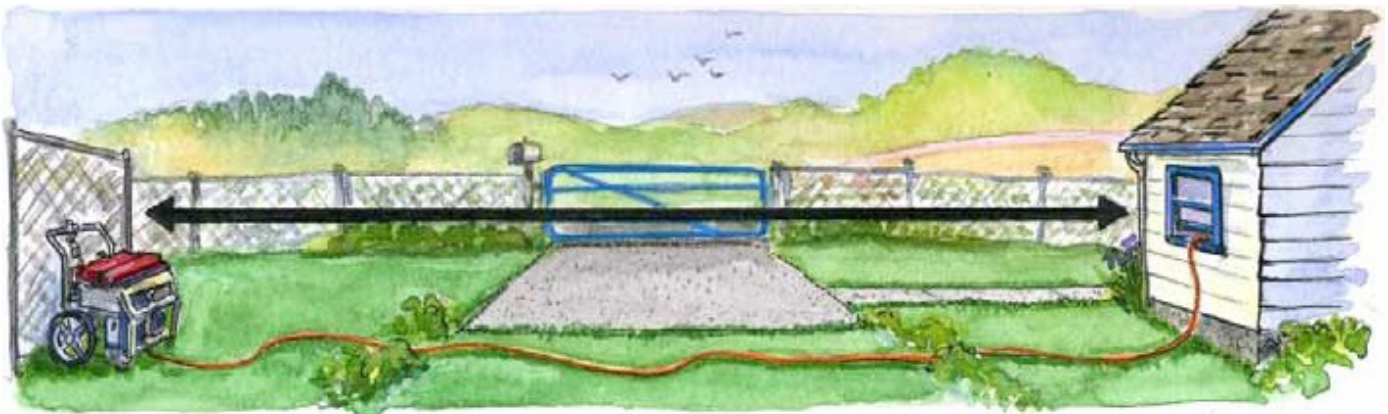
**If you have evacuated, you and your family should wait to re-enter your home until professionals tell you it is safe, with no structural, electrical or other hazards.** Before you start cleanup activities, contact your insurance company and take pictures of the home and your belongings.

The *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* describes how to clean up after a flood. Following the cleanup steps will help you avoid many problems with IAQ. Remember—completely drying your home and removing water-damaged items are critical tasks during flood cleanup.

This job may be too difficult or dangerous for you. It may be best to get help from experienced and qualified professionals if you can. The *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* provides tips for finding a qualified professional.

If you must do some tasks yourself, the *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* is just one of the many resources available to you. You can find links to some helpful resources from EPA and other government agencies and national nonprofit organizations at the end of this fact sheet. Detailed resources, such as *Repairing Your Flooded Home* from FEMA and the American Red Cross and *A Field Guide for Flooded Home Cleanup* from the National Center for Healthy Housing, explain flood cleanup, including topics that are not related to indoor air quality. For the tasks you must do yourself, **reading these resources could save your life.** They also give tips that can save you time and money as you plan your recovery.

## Protect Yourself From Carbon Monoxide Poisoning



Use combustion devices, such as portable generators, **OUTSIDE** and **FAR AWAY** from buildings.

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Sometimes the power goes out after a flood. So, some people use machines called portable generators for electricity during flood cleanup. Portable generators and other combustion devices like camp stoves, lanterns, or charcoal-burning devices produce **carbon monoxide (CO)**. You cannot see or smell CO, but it could kill you in minutes if you breathe it in. Use portable generators and other devices **OUTSIDE** and **FAR AWAY** from buildings. EPA provides tips to help maintain IAQ during **power outages**.

## Protect Yourself Before You Enter a Flooded Home

Before you enter or inspect a home that may be moldy, keep in mind that breathing in mold may cause health effects, such as allergic reactions or respiratory irritation. Be sure to protect yourself from exposure to mold and other contaminants by following the guidance for respiratory protection in the *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* or other federal guidance.

**At a minimum, wear an N-95 respirator mask, goggles and protective gloves.** EPA's booklet *Flood Cleanup and the Air in Your Home* provides illustrations to help you choose protective clothing.



At a minimum, wear an N-95 respirator mask, goggles and protective gloves to protect yourself from mold and other contaminants.

## Remove Standing Water

Microorganisms, such as bacteria, can multiply and grow in standing water. From there, they can get in the air, where you can inhale them. Even when flooding is due to rainwater, floodwater can get mixed with sewage, dirt, or other substances and bring contaminants such as bacteria and chemicals into your home.

You should remove all standing water as soon as possible. Use a wet vacuum to remove water from floors, carpets and hard surfaces.



During flood cleanup, completely drying your home and removing water-damaged items are critical tasks.

## Dry Out Your Home and Remove Wet Materials

The *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* explains the steps you should take to open and dry out your home. Before you remove wet materials, especially construction materials like wallboard or ceiling and floor tiles, take care to avoid problems with airborne asbestos and lead dust.

## Use Special Caution if Asbestos and Lead Are Present

Elevated concentrations of airborne [asbestos](#) can occur if asbestos-containing materials present in the home are disturbed. Airborne asbestos can cause lung cancer and mesothelioma, a cancer of the chest and abdominal linings. If you know or suspect that your home contains asbestos, contact the [EPA TSCA Assistance Information Service](#) at (202) 554-1404 or [tsc-hotline@epa.gov](mailto:tsc-hotline@epa.gov) for information on steps you should take to avoid exposure.

[Lead](#) is a highly toxic metal that produces a range of adverse health effects, particularly in young children. Disturbance or removal of materials containing lead-based paint may result in an elevated concentration of lead dust in the air. If you know or suspect that your home contains lead-based paint, contact the [National Lead Information Center](#) to receive a general information packet, to order other documents, or for detailed information or questions. Call and speak with a specialist Monday through Friday, 8:00 a.m. to 6:00 p.m. Eastern time (except federal holidays) at 1-800-424-LEAD (5323).

## Sort Materials for Disposal or Cleaning

You can usually clean and dry materials that do not soak up water, such as metal, glass and hard plastic. You should throw away materials that soak up a lot of water, such as drywall, carpets and ceiling tiles. [Mold: Worker and Employer Guide to Hazards and Recommended Controls](#) provides more information about whether to clean and dry or to throw away different types of wet materials. The *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* explains how to separate debris for removal.



**DO NOT** mix bleach and ammonia because the combination can create toxic vapors.

Throwing away damaged items from your flooded home can be difficult, especially if they have special meaning. However, some things are tough to clean and dry after a flood. Most of the time, you should throw away any materials that got wet and cannot be thoroughly cleaned and dried within 24–48 hours.

## Clean Remaining Materials

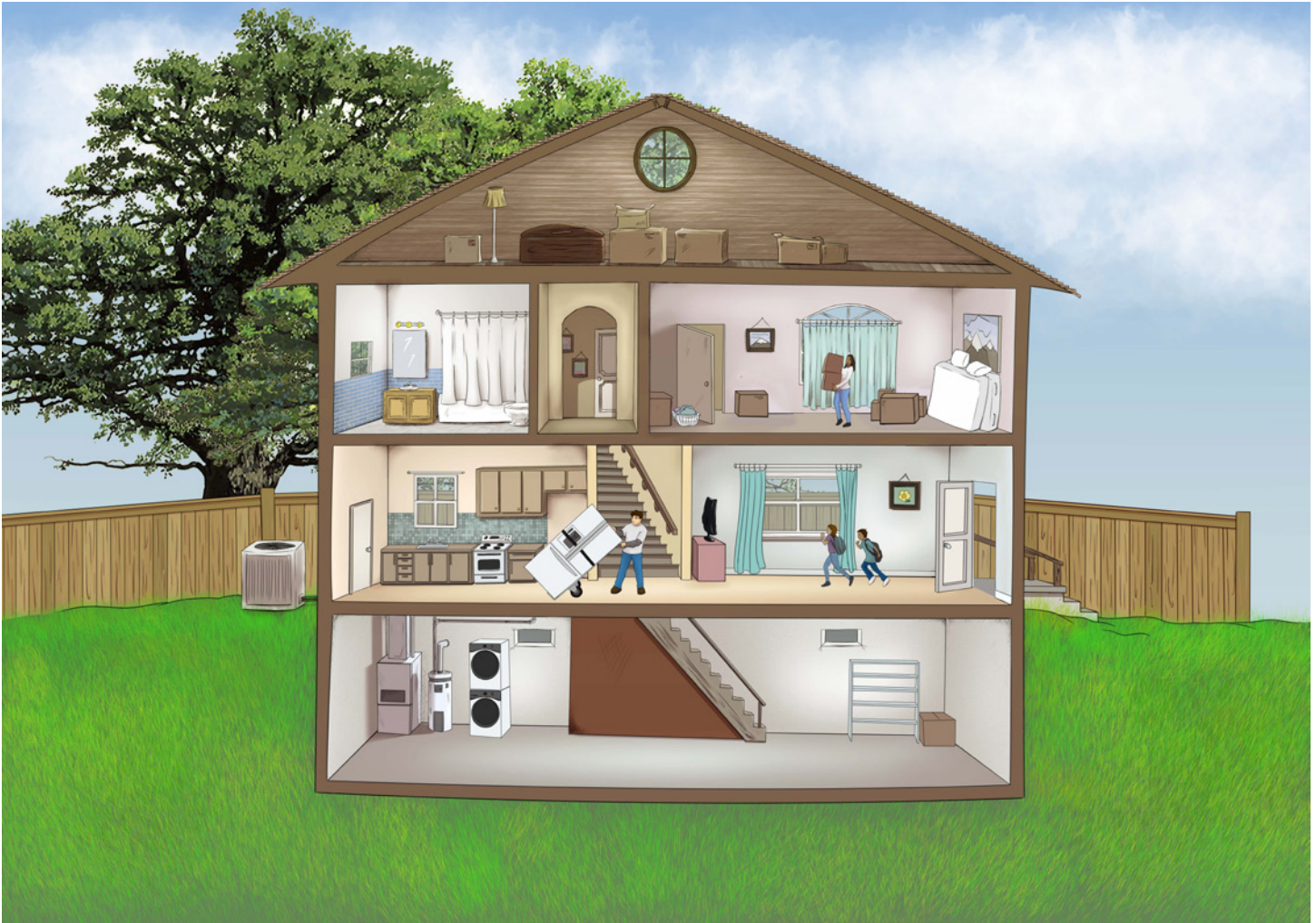
Clean the materials and items you can save with water and your choice of detergent. Be sure to remove all the mold you can see. Dry right away. Note: If you choose to use a disinfectant, the surfaces must be cleaned first for the disinfectant to effectively kill microorganisms.

If you use cleaning products, **DO NOT** mix cleaning products together. Read and follow the instructions on the product label and use all cleaning products in a well-ventilated area.

Cleaning and drying your air ducts can be complicated. Some resources suggest using chemical biocides (also called disinfectants and sanitizers) on flooded ductwork for the heating



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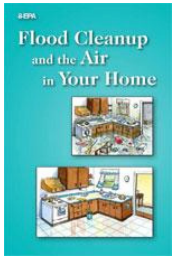
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and air conditioning system. You should consider what materials your ducts are made from and whether all directions on the product are appropriate for use in ducts before using chemicals in your ventilation system. If you can, hire a professional to do this for you. EPA's [Should You Have the Air Ducts in Your Home Cleaned?](#) provides information on the use of chemical biocides in ducts and tips for choosing a duct cleaning service provider. The section "Should chemical biocides be applied to the inside of air ducts?" describes some issues you should talk about with your service provider before they use a biocide in your ductwork.

### Make Sure Your Cleanup Is Complete

Ensure that cleanup is complete before reoccupying your home. You may need to ask a mold remediation professional to help you. The *Homeowner's and Renter's Guide to Mold Cleanup After Disasters* provides more information about how to know when your cleanup is complete.

## Additional Information on Flood Cleanup



### **EPA**

*Flood Cleanup and the Air in Your Home*

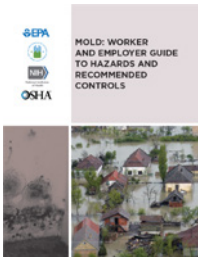
([www.epa.gov/mold/flood-cleanup-and-air-your-home-booklet](http://www.epa.gov/mold/flood-cleanup-and-air-your-home-booklet))



### **EPA/Centers for Disease Control and Prevention (CDC)/Federal Emergency Management Agency (FEMA)/U.S. Department of Housing and Urban Development (HUD)/National Institutes of Health (NIH)**

*Homeowner's and Renter's Guide to Mold Cleanup After Disasters*

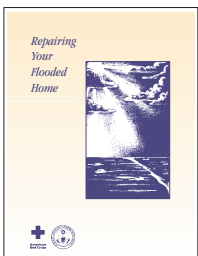
([www.epa.gov/sites/production/files/2017-08/documents/mold.\\_homeowners\\_and\\_renters\\_guide\\_to\\_cleanup\\_after\\_disasters.pdf](http://www.epa.gov/sites/production/files/2017-08/documents/mold._homeowners_and_renters_guide_to_cleanup_after_disasters.pdf))



### **EPA/HUD/NIH/Occupational Safety and Health Administration**

*Mold: Worker and Employer Guide to Hazards and Recommended Controls*

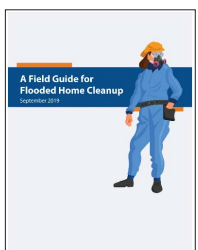
([www.epa.gov/sites/production/files/2017-08/documents/mold\\_worker\\_and\\_employer\\_guide.\\_disaster-flood\\_cleanup.pdf](http://www.epa.gov/sites/production/files/2017-08/documents/mold_worker_and_employer_guide._disaster-flood_cleanup.pdf))



### **FEMA/American Red Cross**

*Repairing Your Flooded Home*

([www.redcross.org/images/MEDIA\\_CustomProductCatalog/m4540081\\_repairingFloodedHome.pdf](http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4540081_repairingFloodedHome.pdf))



### **National Center for Healthy Housing**

*A Field Guide for Flooded Home Cleanup*

([https://nchh.org/resource/flood-guide\\_a-field-guide-for-flooded-home-cleanup/](https://nchh.org/resource/flood-guide_a-field-guide-for-flooded-home-cleanup/))

## Resources on Floods and Other Disasters

### EPA

Floods: [www.epa.gov/natural-disasters/flooding](http://www.epa.gov/natural-disasters/flooding)

Flood Cleanup and IAQ: [www.epa.gov/indoor-air-quality-iaq/flood-cleanup-protect-indoor-air-quality](http://www.epa.gov/indoor-air-quality-iaq/flood-cleanup-protect-indoor-air-quality)

Emergencies and IAQ: [www.epa.gov/indoor-air-quality-iaq/emergencies-and-iaq](http://www.epa.gov/indoor-air-quality-iaq/emergencies-and-iaq)

### FEMA

Floods: [www.ready.gov/floods](http://www.ready.gov/floods)

Free Publications: [www.ready.gov/publications](http://www.ready.gov/publications)

1-800-BE-READY (1-800-237-3239), M–F, 8:00 a.m. – 5:00 p.m. Eastern time

[fema-publications-warehouse@fema.gov](mailto:fema-publications-warehouse@fema.gov)

Federal Disaster Assistance: [www.disasterassistance.gov](http://www.disasterassistance.gov)

### CDC

Floods: [www.cdc.gov/disasters/floods](http://www.cdc.gov/disasters/floods)

### American Red Cross

Floods: [www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/flood](http://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/flood)

### American Lung Association

Floods and Water Damage:

[www.lung.org/our-initiatives/healthy-air/outdoor/emergencies-and-natural-disasters/floods-and-water-damage.html](http://www.lung.org/our-initiatives/healthy-air/outdoor/emergencies-and-natural-disasters/floods-and-water-damage.html)