From: Dunbar, Bill
Sent: Thursday, September 14, 2017 1:40 PM
To: Rogers, Joan; McKinney, Jason; Flores-Gregg, Paula; Vaughn, Gloria; Urban, Trevor; Collier, Deanna; Murray, Annah; Sanders, LaTonya; Houston, Pamela; Swatts, Darriel; Bryan, David; Watson, Linda (R3); Ford, Jeremy; Wilson, Wenona; Taylor, Maren; Maynard, Katy; Kerr, Michelle; Ohl, Matthew; Stevens, Jim; Pollock, Devin; Villaneda-VanVloten, Isabel; Leos, Valmichael; Ofosu, Philip; Ortiz, Eduardo; Stowell, Jacob; Ropski, Carol; Burrus, Sheila; Deyoe, Jeremy; Zieba, Kyle
Subject: All fact sheets in normal PDF form…
Attachments: EPA--Carbon Monoxide Fact Sheet.pdf; EPA--Disinfecting Drinking Water--Spanish.pdf; EPA--Emergency Disinfection of Drinking Water.pdf; EPA--Flood Cleanups Avoiding Indoor Air Quality Problems.pdf; EPA--Mold Homeowners and Renters Guide to Cleanup after Disasters.pdf; EPA--Post-Disaster Renovations & Lead-based Paint.pdf; EPA--Private Wells--What to do After the Flood.pdf; EPA--Proper Medicine Disposal.pdf; EPA--Septic Systems--What to do After the Flood.pdf; flood_cleanup_and_the_air_in_your_home._poster.pdf; Hurricane_Flyer4_9-6-17.pdf; OSHA Asbestos Fact Sheet.pdf; TCEQ--Disinfecting Your Private Well (1).pdf

…I think…the purpose of sending this everyone is to avoid the hassle a couple of people have experienced – having to register for SharePoint before viewing the fact sheets.

I hope this eliminates that problem.

--B.

Bill Dunbar
U.S. E.P.A. Region 10
206/553-1019

From: Rogers, Joan
Sent: Wednesday, September 13, 2017 8:01 PM
To: McKinney, Jason ; Flores-Gregg, Paula ; Vaughn, Gloria ; Urban, Trevor ; Collier, Deanna ; Murray, Annah ; Sanders, LaTonya ; Houston, Pamela ; Swatts, Darriel ; Bryan, David ; Watson, Linda (R3) ; Ford, Jeremy ; Wilson, Wenona ; Taylor, Maren ; Maynard, Katy ; Kerr, Michelle ; Ohl, Matthew ; Stevens, Jim ; Pollock, Devin ; Villaneda-VanVloten, Isabel ; Dunbar, Bill ; Leos, Valmichael ; Ofosu, Philip ; Ortiz, Eduardo ; Stowell, Jacob ; Ropski, Carol ; Burrus, Sheila ; Deyoe, Jeremy ; Zieba, Kyle ; Rogers, Joan
Subject: Friday outing to Houston Astros Game vs. Seattle Mariners

Hi all.

I'm planning on going to see the Astros game on Friday night. The Astros are in first place in the American League West and they are playing the Mariners who are in 4th place in AL West. The game is at 7:10 and there is a Friday happy hour from 5-6:30pm in the Budweiser Brew House with beer and food specials.

There are tickets in the upper deck from $10-$30 depending on the section. There is about $8 in fees for each ticket. Minute Maid Park is only 0.5 miles from our hotel and we can walk there in 10 minutes.

Let me know who is interested in going. I'd be happy to order tickets for anyone so we get seats together. I'd like to place my order by 9pm on Thursday night.

-Joan

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7033515

United States
Environmental Protection
Agency

Indoor Environments Division (6609J)
Office of Air and Radiation

EPA-402-F-96-005
October 1996

Protect Your Family and Yourself from Carbon Monoxide Poisoning

Carbon Monoxide Can Be Deadly

You can't see or smell carbon monoxide, but at high levels it can kill a person in minutes. Carbon monoxide (CO) is produced whenever any fuel such as gas, oil, kerosene, wood, or charcoal is burned. If appliances that burn fuel are maintained and used properly, the amount of CO produced is usually not hazardous. However, if appliances are not working properly or are used incorrectly, dangerous levels of CO can result. Hundreds of people die accidentally every year from CO poisoning caused by malfunctioning or improperly used fuel-burning appliances. Even more die from CO produced by idling cars. Fetuses, infants, elderly people, and people with anemia or with a history of heart or respiratory disease can be especially susceptible. Be safe. Practice the DO's and DON'Ts of carbon monoxide.

CO Poisoning Symptoms

Know the symptoms of CO poisoning. At moderate levels, you or your family can get severe headaches, become dizzy, mentally confused, nauseated, or faint. You can even die if these levels persist for a long time. Low levels can cause shortness of breath, mild nausea, and mild headaches, and may have longer-term effects on your health. Since many of these symptoms are similar to those of the flu, food poisoning, or other illnesses, you may not think that CO poisoning could be the cause.

Play it Safe

If you experience symptoms that you think could be from CO poisoning:

✓ **DO *GET FRESH AIR IMMEDIATELY.*** Open doors and windows, turn off combustion appliances and ***leave the house***.

✓ **DO *GO TO AN EMERGENCY ROOM*** *and tell the physician you suspect CO poisoning.* If CO poisoning has occurred, it can often be diagnosed by a blood test done soon after exposure.

✓ **DO** Be prepared to answer the following questions for the doctor:

- Do your symptoms occur only in the house? Do they disappear or decrease when you leave home and reappear when you return?
- Is anyone else in your household complaining of similar symptoms? Did everyone's symptoms appear about the same time?
- Are you using any fuel-burning appliances in the home?
- Has anyone inspected your appliances lately? Are you certain they are working properly?

Prevention **is the Key to Avoiding Carbon Monoxide Poisoning**

✓ **DO** have your fuel-burning appliances -- including oil and gas furnaces, gas water heaters, gas ranges and ovens, gas dryers, gas or kerosene space heaters, fireplaces, and wood stoves -- inspected by a trained professional at the beginning of every heating

season. Make certain that the flues and chimneys are connected, in good condition, and not blocked.

✓ **DO** choose appliances that vent their fumes to the outside whenever possible, have them properly installed, and maintain them according to manufacturers' instructions.

✓ **DO** read and follow all of the instructions that accompany any fuel-burning device. If you cannot avoid using an unvented gas or kerosene space heater, *carefully follow the cautions* that come with the device. Use the proper fuel and keep doors to the rest of the house open. Crack a window to ensure enough air for ventilation and proper fuel-burning.

✓ **DO** call EPA's IAQ INFO Clearinghouse (**1-800-438-4318**) or the Consumer Product Safety Commission (**1-800-638-2772**) for more information on how to reduce your risks from CO and other combustion gases and particles.

✗ **DON'T** idle the car in a garage -- even if the garage door to the outside is open. Fumes can build up very quickly in the garage and living area of your home.

✗ **DON'T** use a gas oven to heat your home, even for a short time.

✗ **DON'T** ***ever*** use a charcoal grill indoors -- even in a fireplace.

✗ **DON'T** sleep in any room with an unvented gas or kerosene space heater.

✗ **DON'T** use any gasoline-powered engines (mowers, weed trimmers, snow blowers, chain saws, small engines or generators) in enclosed spaces.

✗ **DON'T** ignore symptoms, particularly if more than one person is feeling them. You could lose consciousness and die if you do nothing.

A Few Words About CO Detectors

Carbon Monoxide Detectors are widely available in stores and you may want to consider buying one as a back up -- *BUT NOT AS A REPLACEMENT* for proper use and maintenance of your fuel-burning appliances. However, it is important for you to know that the technology of CO detectors is still developing, that there are several types on the market, and that they are not generally considered to be as reliable as the smoke detectors found in homes today. Some CO detectors have been laboratory-tested, and their performance varied. Some performed well, others failed to alarm even at very high CO levels, and still others alarmed even at very low levels that don't pose any immediate health risk. And unlike a smoke detector, where you can easily confirm the cause of the alarm, CO is invisible and odorless, so it's harder to tell if an alarm is false or a real emergency.

So What's a Consumer to Do?

First, don't let buying a CO detector lull you into a false sense of security. Preventing CO from becoming a problem in your home is better than relying on an alarm. Follow the checklist of DOs and DON'Ts above.

Second, if you shop for a CO detector, do some research on features and don't select solely on the basis of cost. Non-governmental organizations such as Consumers Union (publisher of *Consumer Reports*), the American Gas Association, and Underwriters Laboratories (UL) can help you make an informed decision. Look for UL certification on any detector you purchase.

Carefully follow manufacturers' instructions for its placement, use, and maintenance.

If the CO detector alarm goes off:

- Make sure it is your CO detector and not your smoke detector.
- Check to see if any member of the household is experiencing symptoms of poisoning.
- If they are, get them out of the house immediately and seek medical attention. Tell the doctor that you suspect CO poisoning.
- If no one is feeling symptoms, ventilate the home with fresh air, turn off all potential sources of CO -- your oil or gas furnace, gas water heater, gas range and oven, gas dryer, gas or kerosene space heater and any vehicle or small engine.
- Have a qualified technician inspect your fuel-burning appliances and chimneys to make sure they are operating correctly and that there is nothing blocking the fumes from being vented out of the house.

DESINFECCIÓN DE AGUA POTABLE EN SITUACIONES DE EMERGENCIA

En una situación de emergencia, en que el servicio de agua habitual está interrumpido (por ejemplo, ante un huracán, una inundación o la rotura de una tubería de agua), es posible que las autoridades locales recomienden consumir solo agua envasada, hervida o desinfectada hasta que se restablezca el servicio de agua habitual. Las siguientes instrucciones le muestran cómo hervir y desinfectar agua para eliminar la mayoría de los microorganismos que causan enfermedades y que pueden estar en el agua. Sin embargo, al hervir o desinfectar el agua, no se eliminan otros contaminantes, como los metales pesados, las sales y la mayoría de otras sustancias químicas.

PARA BEBER, COCINAR, ELABORAR CUALQUIER BEBIDA PREPARADA, LAVAR LOS PLATOS Y CEPILLARSE LOS DIENTES, USE SOLO AGUA QUE HAYA SIDO DESINFECTADA EN FORMA ADECUADA.

- ❑ Use **agua embotellada** o agua que haya preparado y almacenado en forma apropiada como suministro de agua de emergencia.

- ❑ Si no tiene agua envasada, **hierva agua corriente**. Hervirla será suficiente para eliminar bacterias patógenas, virus y protozoos (OMS, 2015).
  - Si el aspecto del agua es turbio, permita que se asiente y fíltrela haciéndola pasar por un paño limpio, servilleta de papel o filtro de café.
  - Permita que el agua alcance un hervor constante durante no menos de un minuto. En lugares que estén a una altitud superior a los 5000 pies (1000 metros), hierva el agua durante tres minutos.
    - Deje que se enfríe en forma natural y guárdela en recipientes limpios con tapa.
  - Para mejorar el sabor soso del agua hervida, agregue una pizca de sal por cada cuarto de galón o litro de agua, o vierta el agua de un recipiente limpio a otro varias veces.

- ❑ Si no puede hervir agua, **desinféctela con lejía de uso doméstico**. Use solo productos a base de lejía de cloro sin olor que sean aptos para desinfección e higiene, según se indica en la etiqueta. No use lejía con aroma, para ropa de color ni con limpiadores agregados.
  - Si el aspecto del agua es turbio, permita que se asiente y fíltrela haciéndola pasar por un paño limpio, servilleta de papel o filtro de café.
  - Busque un gotero limpio del gabinete de medicamentos o del equipo de insumos de emergencia.
    - Busque la lejía líquida que haya estado guardada a temperatura ambiente durante menos de un año. La etiqueta debería indicar que contiene 8,25 % de hipoclorito de sodio.
  - Use la tabla que está en la siguiente página como una guía para decidir la cantidad de lejía que debe agregar al agua; por ejemplo, agregue 6 gotas de lejía por cada galón de agua. Duplique la cantidad de lejía si el agua está turbia, tiene algún color o está muy fría.
  - Mezcle y deje reposar durante 30 minutos. El agua debería tener un olor suave a cloro. De lo contrario, repita la dosis y deje en reposo durante otros 15 minutos antes de usar.
  - En caso de que el sabor a cloro sea demasiado intenso, vierta el agua de un recipiente limpio a otro y deje reposar durante algunas horas antes de usarla.

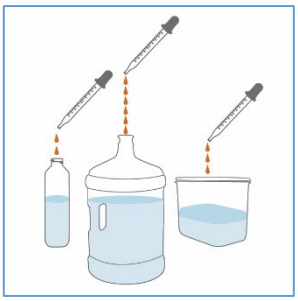


Tabla 1: Guía de dosis de lejía según la cantidad de agua

Volume of Water	Amount of Liquid Bleach to Add†
1 cuarto/litro	2 gotas
1 galón	6 gotas
2 galones	12 gotas (1/8 de
4 galones	1/4 cucharadita
8 galones	1/2 cucharadita
† La lejía contiene 8,25 % de hipoclorito de sodio.	

ORIENTACIÓN ADICIONAL SOBRE EL AGUA EN CASOS DE EMERGENCIA

Prepare y guarde un suministro de agua de emergencia. Visite el sitio web de la Agencia Federal para el Manejo de Emergencias (FEMA, por sus siglas en inglés) www.ready.gov/managing-water para obtener más información en inglés sobre cómo preparar y almacenar un suministro de agua de emergencia.

Busque otras fuentes de agua en su casa o en los alrededores. Si bien el agua envasada es la mejor opción, tal vez encuentre otras fuentes de agua si derrite cubos de hielo o desagota las tuberías o el tanque de agua caliente. No debe usar el agua del tanque de depósito ni del interior del inodoro ni de radiadores, colchones de agua, piscinas o hidromasajes.

Puede usar agua de ríos o lagos. Por lo general, es mejor usar agua que circula en lugar de agua quieta o estancada. No obstante, no use agua que tenga material que flota, color oscuro u olor dudoso.

Cualquiera sea la fuente, trate el agua según las instrucciones que están en la página anterior.

Si en su propiedad cuenta con un pozo de agua que se inundó, asegúrese de desinfectarlo y realice una prueba en el agua del pozo después de la inundación. Para obtener asesoramiento, comuníquese con el Departamento de Salud estatal o local o ingrese en water.epa.gov/drink/info/well/whatdo.cfm.

Tenga en cuenta el aspecto del agua y cómo filtrarla, si fuera necesario. La desinfección no actúa bien cuando el agua está turbia o tiene color. Si observa turbidez, deje que se asiente. Luego, filtre el agua haciéndola pasar por un paño limpio, servilleta de papel o filtro de café. Guarde el agua asentada y filtrada en recipientes limpios y con tapa.

OTROS MÉTODOS DE DESINFECCIÓN

Si no tiene lejía líquida, puede usar alguno de los otros métodos de desinfección que se describen a continuación.

- **Hipoclorito de calcio granulado**. El primer paso es preparar una solución de cloro que usará para desinfectar el agua. Por su seguridad, hágalo en un área ventilada y use protección para los ojos. Agregue una cucharadita colmada (aproximadamente ¼ de onza) de hipoclorito de calcio (HTH) granulado de alta resistencia a dos galones de agua y mezcle hasta que las partículas se haya disuelto. De la mezcla se obtendrá una solución de aproximadamente 500 miligramos por litro. Para desinfectar el agua, agregue una parte de solución de cloro por cada 100 partes de agua que está en tratamiento. Esto es casi lo mismo que agregar 1 pinta (16 onzas) de solución de cloro a 12,5 galones de agua. En caso de que el sabor a cloro sea demasiado intenso, vierta el agua de un recipiente limpio a otro y deje reposar durante algunas horas antes de usarla. PRECAUCIÓN: El HTH es un oxidante muy potente. Siga las instrucciones de la etiqueta sobre la manipulación y el almacenamiento seguros de esta sustancia química.
- **Yodo de uso doméstico (o "tintura de yodo")**. Es probable que tenga yodo en su gabinete de medicamentos o equipo de primeros auxilios. Agregue cinco gotas de tintura de yodo al 2 % por cada cuarto de galón o litro de agua que desinfectará. Si el agua está turbia o tiene color, agregue 10 gotas de yodo. Mezcle y deje que el agua repose durante al menos 30 minutos antes de usarla.
- **Tabletas para desinfección de agua**. Puede desinfectar agua con tabletas que contienen cloro, yodo, dióxido de cloro u otros agentes desinfectantes. Estas tabletas están disponibles en forma electrónica o en farmacias y en tiendas de artículos deportivos. Siga las instrucciones que aparecen en la etiqueta, ya que cada producto puede tener diferente potencia.

MÁS INFORMACIÓN

Organización Mundial de la Salud (OMS), 2015. *Informe técnico sobre agua hervida*: http://www.who.int/water_sanitation_health/dwq/Boiling_water_01_15.pdf?ua=1&ua=1]

Línea de atención directa de EPA sobre el Agua Potable Segura 1-800-426-4791
water.epa.gov/drink/hotline

United States Environmental Protection Agency

EMERGENCY DISINFECTION OF DRINKING WATER

In an emergency situation where regular water service has been interrupted – like a hurricane, flood, or water pipe breakage – local authorities may recommend using only bottled water, boiled water, or disinfected water until regular water service is restored. The instructions below show you how to boil and disinfect water to kill most disease-causing microorganisms that may be present in the water. However, boiling or disinfection will not destroy other contaminants, such as heavy metals, salts, and most other chemicals.

ONLY USE WATER THAT HAS BEEN PROPERLY DISINFECTED FOR DRINKING, COOKING, MAKING ANY PREPARED DRINK, WASHING DISHES, AND FOR BRUSHING TEETH.

- ❑ Use **bottled water** or water you have properly prepared and stored as an emergency water supply.
- ❑ **Boil water**, if you do not have bottled water. Boiling is sufficient to kill pathogenic bacteria, viruses and protozoa (WHO, 2015).
  - If water is cloudy, let it settle and filter it through a clean cloth, paper towel, or coffee filter.
  - Bring water to a rolling boil for at least one minute. At altitudes above 5,000 feet (1,000 meters), boil water for three minutes.
  - Let water cool naturally and store it in clean containers with covers.
  - To improve the flat taste of boiled water, add one pinch of salt to each quart or liter of water, or pour the water from one clean container to another several times.

- ❑ **Disinfect water using household bleach**, if you can't boil water. Only use regular, unscented chlorine bleach products that are suitable for disinfection and sanitation as indicated on the label. Do not use scented, color safe, or bleaches with added cleaners.
  - If water is cloudy, let it settle and filter it through a clean cloth, paper towel, or coffee filter.
  - Locate a clean dropper from your medicine cabinet or emergency supply kit.
  - Locate a fresh liquid chlorine bleach or liquid chlorine bleach that is stored at room temperatures for less than one year. The label should say that it contains 8.25% of sodium hypochlorite.
  - Use the table on the next page as a guide to decide the amount of bleach you should add to the water, for example, add 6 drops of bleach to each gallon of water. Double the amount of bleach if the water is cloudy, colored, or very cold.
  - Stir and let stand for 30 minutes. The water should have a slight chlorine odor. If it doesn't, repeat the dosage and let stand for another 15 minutes before use.
  - If the chlorine taste is too strong, pour the water from one clean container to another and let it stand for a few hours before use.

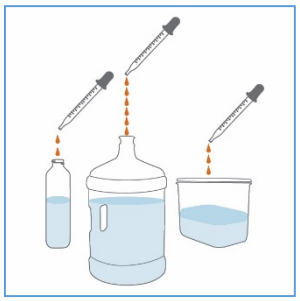


Table 1: Bleach to Water Dose Guidance

Volume of Water	Amount of Liquid Bleach to Add†
1 quart/liter	2 drops
1 gallon	6 drops
2 gallons	12 drops (1/8 teaspoon)
4 gallons	1/4 teaspoon
8 gallons	1/2 teaspoon

† Bleach contains 8.25% sodium hypochlorite.

ADDITIONAL WATER GUIDANCE FOR EMERGENCIES

Prepare and store an emergency water supply. Visit the Federal Emergency Management Agency (FEMA) website www.ready.gov/managing-water for additional guidance on preparing and storing an emergency water supply.

Look for other sources of water in and around your home. Although bottled water is your best choice, you may be able to find other sources of water by melting ice cubes or draining your hot water tank or pipes. You should not use water from toilet flush tanks or bowls, radiators, waterbeds, swimming pools, or spas.

You can also use river or lake water. It is generally better to use flowing water than still, stagnant water. However, do not use water with floating material in it or water that has a dark color or questionable odor.

Regardless of the source, treat the water by following the instructions on the previous page.

If you have a well on your property that has been flooded, make sure to disinfect and test the well water after the flood. Contact your state or local health department for advice or go to water.epa.gov/drink/info/well/whatdo.cfm.

Consider how the water looks and how to filter it if needed. Disinfection does not work as well when water is cloudy or colored. If water is cloudy, let it settle. Then filter the water through a clean cloth, paper towel, or coffee filter. Store the settled and filtered water in clean containers with covers.

OTHER DISINFECTION METHODS

If you don't have liquid bleach, you can use one of the other disinfection methods described below.

- **Granular calcium hypochlorite**. The first step is to make a chlorine solution that you will use to disinfect your water. For your safety, do it in a ventilated area and wear eye protection. Add one heaping teaspoon (approximately ¼ ounce) of high-test granular calcium hypochlorite (HTH) to two gallons of water and stir until the particles have dissolved. The mixture will produce a chlorine solution of approximately 500 milligrams per liter. To disinfect water, add one part of the chlorine solution to each 100 parts of water you are treating. This is about the same as adding 1 pint (16 ounces) of the chlorine solution to 12.5 gallons of water. If the chlorine taste is too strong, pour the water from one clean container to another and let it stand for a few hours before use. CAUTION: HTH is a very powerful oxidant. Follow the instructions on the label for safe handling and storage of this chemical.
- **Common household iodine (or "tincture of iodine")**. You may have iodine in your medicine cabinet or first aid kit. Add five drops of 2% tincture of iodine to each quart or liter of water that you are disinfecting. If the water is cloudy or colored, add 10 drops of iodine. Stir and let the water stand for at least 30 minutes before use.
- **Water disinfection tablets**. You can disinfect water with tablets that contain chlorine, iodine, chlorine dioxide, or other disinfecting agents. These tablets are available online or at pharmacies and sporting goods stores. Follow the instructions on the product label as each product may have a different strength.

MORE INFORMATION

World Health Organization (WHO), 2015. *Technical Briefing on Boil Water*.

Safe Drinking Water Hotline 1-800-426-4791
water.epa.gov/drink/hotline

United States
Environmental Protection
Office of Air and Radiation

Revised November 2012

Flood Cleanup: Avoiding Indoor Air Quality Problems

Fact Sheet

Introduction

During a flood cleanup, the indoor air quality in your home or office may appear to be the least of your problems. However, failure to remove contaminated materials and to reduce moisture and humidity can present serious long-term health risks. Standing water and wet materials are a breeding ground for microorganisms, such as viruses, bacteria, and mold. They can cause disease, trigger allergic reactions, and continue to damage materials long after the flood.

This fact sheet discusses problems caused by microbial growth, as well as other potential effects of flooding, on long-term indoor air quality and the steps you can take to lessen these effects. Although the information contained here emphasizes residential flood cleanup, it is also applicable to other types of buildings.

Prepare for Cleanup

Read ***Repairing Your Flooded Home*** prepared by the Federal Emergency Management Agency and the American Red Cross. The booklet discusses flood safety issues and can save your life. The booklet also contains detailed information on proper methods for cleaning up your home. You should also consult the wealth of information on the FEMA, CDC, and The American Lung Association sites on the subject, which are listed below:

- FEMA website on floods/flooding - www.fema.gov/hazards/floods
- The American Red Cross – www.redcross.org
- American Lung Association's Fact Sheet on Flood Clean-up www.lungusa.org/air/flood_factsheet99.html

This fact sheet provides additional information not covered in the original FEMA/American Red Cross booklet on indoor air quality concerns related to flooding (however, because this fact sheet was prepared in 1993, it is more than likely that FEMA and the Red Cross and the American Lung Association do have more up-to-date information and resources available which you should consult). Many of the methods used for general cleanup, as detailed in the booklet, are the same as those used to avoid problems with indoor air quality. For brevity, we have not provided detail on the general methods used for cleanup here. This fact sheet is intended to be used in conjunction with the FEMA/American Red Cross booklet and resources.

Children are different from adults. They may be more vulnerable to chemicals and organisms they are exposed to in the environment.

Avoid Problems from Microbial Growth

Remove Standing Water

Standing water is a breeding ground for microorganisms, which can become airborne and be inhaled. Where floodwater contains sewage or decaying animal carcasses, infectious disease is of concern. Even when flooding is due to rainwater, the growth of microorganisms can cause allergic reactions in sensitive individuals. For these health reasons, and to lessen structural damage, all standing water should be removed as quickly as possible.

Dry Out Your Home

Excess moisture in the home is an indoor air quality concern for three reasons:

- Microorganisms brought into the home during flooding may present a health hazard. These organisms can penetrate deep into soaked, porous materials and later be released into air or water. Coming in contact with air or water that contains these organisms can make you sick.
- High humidity and moist materials provide ideal environments for the excessive growth of microorganisms that are always present in the home. This may result in additional health concerns such as allergic reactions.
- Long-term increases in humidity in the home can also foster the growth of dust mites. Dust mites are a major cause of allergic reactions and asthma.

See **Step 4, Dry Out Your Home**, of the American Red Cross/FEMA booklet, ***Repairing Your Flooded Home***, on steps that should be taken to open up and dry out ceilings, walls, and floors in the home.

Be patient. The drying out process could take several weeks, and growth of microorganisms will continue as long as humidity is high. If the house is not dried out properly, a musty odor, signifying growth of microorganisms can remain long after the flood.

Remove Wet Materials

It can be difficult to throw away items in a home, particularly those with sentimental value. However, keeping certain items that were soaked by water may be unhealthy. Some materials tend to absorb and keep water more than others. In general, materials that are wet and cannot be thoroughly cleaned and dried within 24-48 hours should be discarded, as they can remain a source of microbial growth.

Information on the types of water-damaged materials that should be discarded are provided in Step 4, Dry Out Your Home, of the American Red Cross/FEMA booklet, *Repairing Your Flooded Home*

The booklet suggests that you may be able to dry out and save certain building materials (for example, wallboard, fiberglass insulation, and wall-to-wall carpeting that were soaked only with clean rainwater). You may, however, want to consider removing and replacing them to avoid indoor air quality problems. Because they take a long time to dry, they may be a source of microbial growth. For information on mold prevention and cleanup, visit www.epa.gov/mold.

In addition, fiberboard, fibrous insulation, and disposable filters should be replaced, if they are present in your heating and air conditioning system and have contacted water. (If a filter was designed to be cleaned with water and was in contact with clean rainwater only, ensure that it is thoroughly cleaned before reinstalling.)

Avoid Problems from the Use of Cleaners and Disinfectants

The cleanup process involves thorough washing and disinfecting of the walls, floors, closets, shelves, and contents of the house. In most cases, common household cleaning products and disinfectants are used for this task. FEMA also suggests the use of disinfectants and sanitizers on the ductwork for the heating and air conditioning system, if it has been flooded.

Disinfectants and sanitizers contain toxic substances. The ability of chemicals in other household products used for cleaning to cause health effects varies greatly, from those with no known health effect to those that are highly toxic. Read and follow label instructions carefully, and provide fresh air by opening windows and doors. If it is safe for you to use electricity and the home is dry, use fans both during and after the use of disinfecting, cleaning, and sanitizing products.

Be careful about mixing household cleaners and disinfectants together. Check labels for cautions on this. Mixing certain types of products can produce toxic fumes and result in injury and even death.

Avoid Carbon Monoxide Poisoning

Carbon monoxide (CO) is a colorless, odorless gas that can be lethal at high levels. Carbon monoxide levels can build up rapidly if certain types of combustion devices (for example, gasoline-powered generators, camp stoves and lanterns, or charcoal-burning devices) are used indoors. Do not use combustion devices designed for outdoor use indoors.

Avoid Problems from Airborne Asbestos and Lead Dust

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 for information on steps you should take to avoid exposure.

Lead is a highly toxic metal which produces a range of adverse health effects, particularly in young children. Disturbance or removal of materials containing lead-based paint may result in 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 am to 6:00 pm eastern time (except Federal holidays) at 1 (800) 424-LEAD [5323].

Additional Information

EPA's website on natural disasters: Flooding - www.epa.gov/naturaldisasters/flooding.html

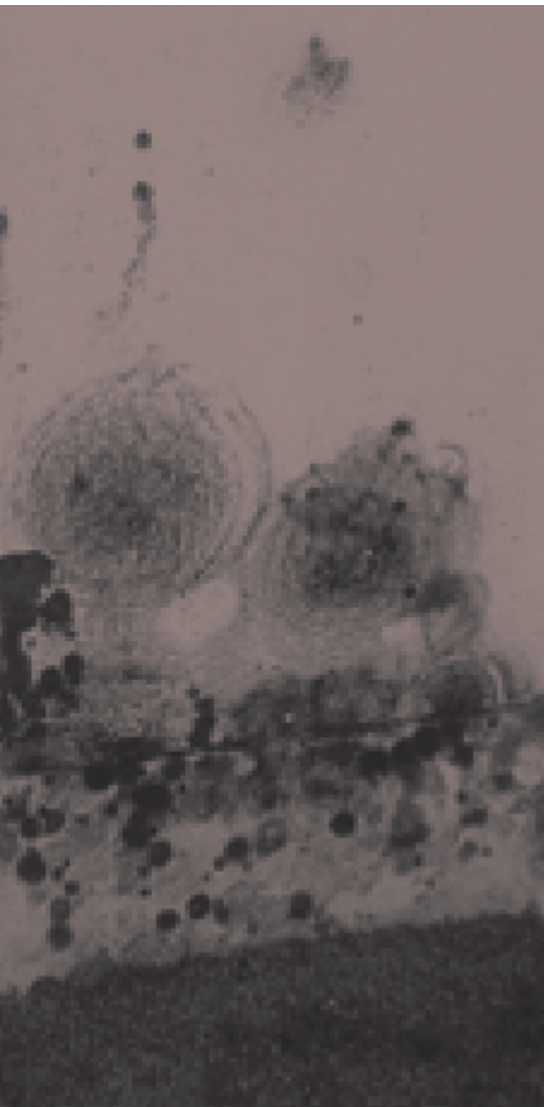
The Federal Emergency Management Agency's Flood website - www.fema.gov/hazards/floods/
Publications are available from:

FEMA – www.fema.gov
Jessup, MD 20794-2012
Phone: 800-480-2520/Fax: 301-362-5335

American Lung Association's Fact Sheet on Flood Clean-up - www.lungusa.org/air/flood_factsheet99.html

Centers for Disease Control (CDC) **Key Facts About Hurricane Recovery** - www.bt.cdc.gov/hurricanes/index.asp

HOMEOWNER'S AND RENTER'S GUIDE TO MOLD CLEANUP AFTER DISASTERS



Cleaning up after a flood can pose health risks. 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. Remember – drying your home and removing water-damaged items is your most important step for preventing mold damage.

IS THERE A PROBLEM?

Was your home flooded? If so, and you were not able to dry your home (including furniture and other items) within 24-48 hours, you should assume you have mold growth. You need to *completely* dry everything, clean up the mold, and make sure you don't still have a moisture problem.

You may see or smell mold on clothing, drywall, furniture, cardboard boxes, or books, but it may also be hidden under or behind items like carpet, cushions, or walls.

MOLD BASICS: HOW MOLDS CAN AFFECT YOUR HEALTH

Exposure to mold can lead to asthma attacks, eye and skin irritation, and allergic reactions. It can lead to severe infections in people with weakened immune systems. Avoid contaminated buildings and contaminated water as much as you can.

Flood water may have carried sewage or chemicals into your home. This could expose you or your family to viruses, bacteria, disease carriers (such as mosquitos), and parasites, as well as mold. To learn more about cleaning and disinfection go to: http://www.cdc.gov/healthywater/emergency/flood/standing.html

KEY MESSAGES

- Wear personal protective equipment. Wear an N-95 respirator at a minimum, goggles, and protective gloves.
- Use portable generators carefully, outside and away from the home, to avoid carbon monoxide poisoning and fires.
- Ensure the mold cleanup is complete before reoccupying your home.

You can protect yourself and your family from mold exposure by following these steps.

BEFORE YOU ENTER ANY MOLDY SITE:

- **Protect yourself and loved ones against hazards.** People with breathing problems like asthma or who have weakened immune systems should stay away from moldy sites. Children should not take part in disaster cleanup work. Check for loose power lines or gas leaks. Make sure the electricity and gas are turned off. Look for sagging ceilings or floors or other structural problems. Watch out for wet, muddy, or slippery floors.
- **Protect your mouth and nose** against breathing in mold: wear at least an N-95 respirator. If you plan to spend a lot of time removing moldy belongings or doing work like ripping out moldy drywall, wear a half-face or full-face respirator. Basic information on using it is in OSHA's general respiratory protection guidance.
- **Protect your skin.** Wear protective gloves (non-latex, vinyl, nitrile, or rubber). Do not touch mold or moldy items with bare hands.
- **Protect your eyes.** Wear goggles that provide *complete* eye protection. Choose goggles designed to keep out dust and small particles. Safety glasses or goggles that have open vent holes will not protect you against dust and small particles.

AFTER YOU LEAVE A MOLD SITE:

- **Protect yourself and loved ones**. Shower and change your clothes. This will help you avoid carrying mold and other hazards back to your current living quarters.

SHOULD I DO THIS MYSELF?

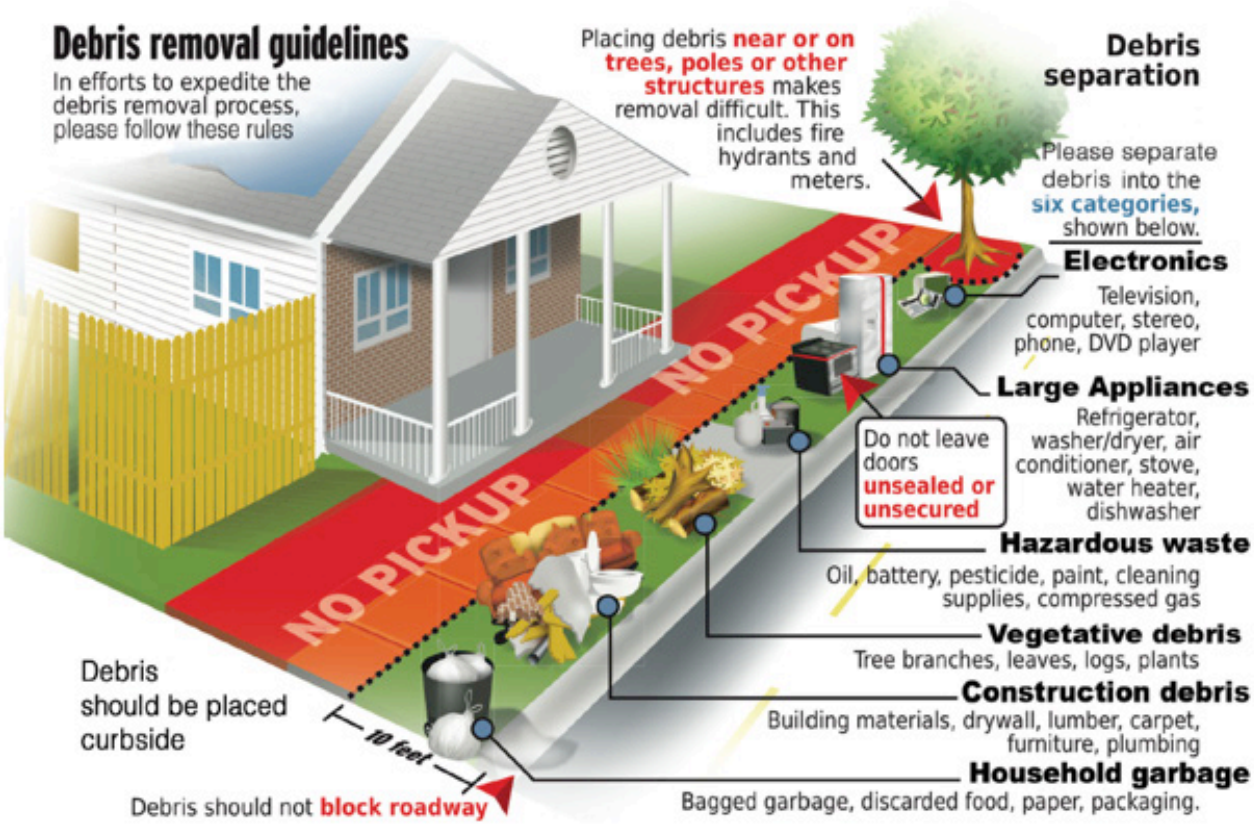
This job may be too difficult or dangerous for you. It may be best to get help from experienced and qualified professionals if you can. Hire a mold inspection or remediation professional affiliated with or certified by the National Environmental Health Association (NEHA), the American Industrial Hygiene Association (AIHA), the Institute of Inspection, Cleaning and Restoration Certification (IICRC), or American Council for Accredited Certification (ACAC) to inspect, repair, and restore the damaged parts of your home. Your state also may regulate mold remediation.

Sampling for mold is not usually recommended. Understanding the results can be difficult, and no matter what kind of mold is in your home, you need to clean it up and fix the moisture problem.

IF I MUST DO THIS MYSELF, HOW CAN I DO IT SAFELY?

Follow these steps:

1. Put on the personal protective equipment described above to protect your eyes, nose, mouth, and skin.
2. Remove standing water and wet materials. Use a wet vacuum to remove water from floors, carpets, and hard surfaces. Dry your home and everything in it as quickly as you can – within 24 to 48 hours if you can.
3. Open all doors and windows when you are working and leave as many open as is safe when you leave.
   - Open inside doors, especially closets and interior rooms, to let air flow to all areas. Take doors off their hinges if you need to.
   - Open kitchen cabinets and bathroom vanity doors; remove drawers, wipe them clean, and stack them to dry.
   - Open the attic access to let air flow to the attic. Before you open the attic door, make sure nothing will fall on you.
4. When electricity is safe to use, use fans and dehumidifiers to remove moisture. Do not use fans if mold has already started to grow, because the fans may spread the mold.
5. Clean with water and a detergent. Remove all mold you can see. Dry right away.
6. If you use cleaning products, do not mix cleaning products together. DO NOT mix bleach and ammonia because it can create toxic vapors.
7. Painting or caulking over mold will not prevent mold from growing. Fix the water problem completely and clean up all the mold before you paint or caulk.
8. Throw away items that can't be cleaned and dried. Throw away anything that was wet with flood water and can't be cleaned and dried completely within 24 to 48 hours. If you have precious items that you want to preserve, follow these guidelines from the Smithsonian Institute: http://www.si.edu/mci/english/learn_more/taking_care/mnm.html



SAFETY TIPS ON USING PORTABLE GENERATORS

If you use a portable generator for electricity use CAUTION to avoid carbon monoxide poisoning and fires.

- Use portable generators OUTSIDE and at least 20 feet away from buildings.
- Do not use portable generators inside your house or garage.
- Do not put portable generators on balconies or near doors, vents, or windows.
- Do not use portable generators near where you or your children are sleeping.
- Never refuel a generator while it is hot.
- For more information, go to: http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf

AM I DONE?

- If you still see or smell mold, you have more work to do. After a remediation, there should be no signs of water damage or mold growth.
- You may need to ask a mold remediation professional to know whether your mold problem is completely fixed. As noted in the "Should I do this myself?" section, sampling for mold is not usually recommended; instead, a careful inspection of the work area for completion of the cleanup and absence of mold-related odors is usually appropriate.
- If you have health problems that get worse when you return home, like asthma or allergy attacks or skin or eye irritation, you may still have some mold.

LOCAL CONTACT INFO:

United States Environmental Protection Agency

Office of Chemical Safety and Pollution Prevention (7404T)

EPA-740-F-11-001
September 2011
FACT SHEET

Post-Disaster Renovations and Lead-Based Paint

What is EPA's Renovation, Repair and Painting (RRP) Rule?
Contractors performing renovation, repair and painting projects that disturb more than six square feet of painted surfaces in homes and child-occupied facilities (including day care centers and schools) built before 1978 must, among other things, be certified and follow lead-safe work practices. Federal law requires that individuals receive certain information, such as EPA's *Renovate Right* brochure, before starting work.

Natural disasters, such as tornadoes, hurricanes, earthquakes or floods, often result in the need for renovations to damaged homes and other structures. When common renovation activities like sanding, cutting, and demolition occur in structures that contain lead-based paint, such activities create lead-based paint hazards, including lead-contaminated dust. Lead-based paint hazards are harmful to both adults and children, but particularly pregnant women and children under age six.

To protect against health risks, EPA's Renovation, Repair and Painting (RRP) Rule is designed to minimize exposure to lead-based paint hazards. Under this Rule, contractors performing renovation, repair and painting projects that disturb painted surfaces in homes and child-occupied facilities (including day care centers and schools), built before 1978, must, among other things, be certified and follow lead-safe work practices. For complete information about the RRP Rule and its requirements, go to: www.epa.gov/lead/pubs/renovation.htm#requirements.

To ensure that property owners and occupants are able to act quickly to preserve their homes and property in the wake of disasters, the RRP Rule includes an emergency provision exempting firms from certain requirements. See 40 CFR 745.82(b). Emergency renovations are defined as renovation activities that were not planned but result from a sudden, unexpected event that, if not immediately attended to, present a safety or public health hazard, or threaten equipment and/or property with significant damage. See the RRP Frequent Questions (FQ), #23002-32367, available at: http://toxics.supportportal.com/ics/support/splash.asp?deptID=23019.

Under the emergency provision of the RRP Rule, contractors performing activities that are immediately necessary to protect personal property and public health need not be RRP trained or certified and are exempt from the following RRP Rule requirements: information distribution, posting warning signs at the renovation site, containment of dust, and waste handling. Firms are NOT exempt from the RRP Rule's requirements related to cleaning, cleaning verification, and recordkeeping. Further, the exemption applies only to the extent necessary to respond to the emergency. Once the portion of the renovation that addresses the source of the emergency is completed, the remaining activities are subject to all requirements of the RRP Rule.

How do I find a list of certified renovation firms in my area?

To search an online directory of certified renovation firms, go to www.epa.gov/getleadsafe.

You can also contact the National Lead Information Center, 1-800-424-LEAD (5323).

What if I have a question about the RRP Rule that is not answered in this fact sheet?

Call the National Lead Information Center at 1-800-424-LEAD (5323).

My home has been severely damaged and will require extensive renovations. Does the RRP Rule apply?

The RRP Rule does not apply to an activity that demolishes and rebuilds a structure to a point where it is effectively new construction. Thus, in pre-1978 homes and child-occupied facilities where all interior and exterior painted surfaces (including windows) are removed and replaced, the provisions of the RRP Rule would not apply. Activities involving the removal and replacement of only some interior and exterior painted surfaces would still be covered under the RRP Rule. For more information, see the Frequent Questions (FQs 23002-18426 and 23002-23415) on our website at: http://epa.gov/lead/pubs/rrp-faq.pdf.

IMPORTANT NOTICE TO HOMEOWNERS

If you hire a contractor to perform renovation work on your pre-1978 home, you should be aware that, generally, your hired professional must be RRP-certified and observe the requirements of the RRP Rule. However, if the circumstances necessitate an emergency renovation as defined above, the professional need not comply with certain requirements of the RRP Rule as described earlier — but only to the extent necessary to respond to the emergency.

The RRP Rule **does not impose requirements on a homeowner performing work on an owner-occupied residence.** However, EPA encourages homeowners to hire certified professionals that have received required training on lead-safe work practices to prevent lead contamination. Homeowners that choose to perform renovation work themselves should take steps to contain the work area, minimize dust and clean up thoroughly. To learn how to perform renovation work safely, contact the National Lead Information Center, 1-800-424-LEAD (5323).

What steps should homeowners take to protect themselves and their families from exposure to lead dust if they plan on doing their own renovations?

- Contain the work area so that dust does not escape from the area. Cover floors and furniture that cannot be moved with heavy-duty plastic and tape, and seal off doors and heating and cooling system vents.
- Keep children, pregnant women, and pets out of the work area at all times.
- Minimize dust during the project by using techniques that generate less dust, such as wet sanding or scraping, or using sanders or grinders that have HEPA vacuum attachments which capture the dust that is generated.
- Clean up thoroughly by using a HEPA vacuum and wet wiping to clean up dust and debris on surfaces. Mop floors with plenty of rinse water before removing plastic from doors, windows, and vents.

United States Environmental Protection Agency

What to Do After the Flood

Drilled, driven or bored wells are best disinfected by a well or pump contractor, because it is difficult for the private owner to thoroughly disinfect these wells.

If you suspect that your well may be contaminated, contact your local or state health department or agriculture extension agent for specific advice on disinfecting your well. The suggestions below are intended to supplement flood precautions issued by State and local health authorities.

WARNING!
DO NOT TURN ON THE PUMP
There is danger of electrical shock and damage to your well or pump if they have been flooded

WARNING!
DO NOT WASH WITH WELL WATER
People drinking or washing with water from a private well that has been flooded will risk getting sick.

Well and Pump Inspection

Flood Conditions at the Well - Swiftly moving flood water can carry large debris that could loosen well hardware, dislodge well construction materials or distort casing. Coarse sediment in the flood waters could erode pump components. If the well is not tightly capped, sediment and flood water could enter the well and contaminate it. Wells that are more than 10 years old or less than 50 feet deep are likely to be contaminated, even if there is no apparent damage. Floods may cause some wells to collapse.

Electrical System - After flood waters have receded and the pump and electrical system have dried, do not turn on the equipment until the wiring system has been checked by a qualified electrician, well contractor, or pump contractor. If the pump's control box was submerged during the flood all electrical components must be dry before electrical service can be restored. Get assistance in turning the pump on from a well or pump contractor.

Pump Operation - All pumps and their electrical components can be damaged by sediment and flood water. The pump including the valves and gears will need to be cleaned of silt and sand. If pumps are not cleaned and properly lubricated they can burn out. Get assistance from a well or pump contractor who will be able to clean, repair or maintain different types of pumps.

Emergency Disinfection of Wells that have been Flooded

Before Disinfection: Check the condition of your well. Make sure there is no exposed or damaged wiring. If you notice any damage, call a professional before the disinfection process.

Materials Needed:

- One gallon of non-scented household liquid bleach;
- rubber gloves;
- eye protection;
- old clothes; and
- a funnel.

Step 1

If your water is muddy or cloudy, run the water from an outside spigot with a hose attached until the water becomes clear and free of sediments.

Step 2

Determine what type of well you have and how to pour the bleach into the well. Some wells have a sanitary seal with either an air vent or a plug that can be removed (a). If it is a bored or dug well, the entire cover can be lifted off to provide a space for pouring the bleach into the well (b).

Step 3

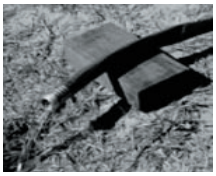
Take the gallon of bleach and funnel (if needed) and carefully pour the bleach down into the well casing.

Step 4

After the bleach has been added, run water from an outside hose into the well casing until you smell chlorine coming from the hose. Then turn off the outside hose.

Step 5

Turn on all cold water faucets, inside and outside of house, until the chlorine odor is detected in each faucet, then shut them all off. If you have a water treatment system, switch it to bypass before turning on the indoor faucets.



Step 6

Wait 6 to 24 hours before turning the faucets back on. It is important not to drink, cook, bathe or wash with this water during the time period --- it contains high amounts of chlorine.

Step 7

Once the waiting period is up, turn on an outside spigot with hose attached and run the water into a safe area where it will not disturb plants, lakes, streams or septic tanks. Run the water until there is no longer a chlorine odor. Turn the water off.

Step 8

The system should now be disinfected, and you can now use the water.

Step 9

Have your water tested for bacteria 7 to 10 days after disinfection.

Sampling and Testing the Well Water

Contact the local health department to have well water sampled and tested for contamination. Or, call your state laboratory certification officer to find a certified lab near you. You can get this number from the Safe Drinking Water Hotline (1-800-426-4791).

If the health department issues sterile bottles for the private well owner to collect water samples, follow all instructions for the use of these bottles.

After the pump is back in operation, the health department should sample and test the water at regular intervals.

CAUTION: Because of the extensive flood area and the speed and direction of ground water flow, your well may not be a safe source of water for many months after the flood. The well can become contaminated with bacteria or other contaminants. Waste water from malfunctioning septic tanks or chemicals seeping into the ground can contaminate the ground water even after the water was tested and found to be safe. It will be necessary to take long range precautions, including repeated testing, to protect the safety of drinking water.

CONCERNS AND ADVISORIES

If in doubt about the well water supply, follow health department drinking and bathing advisories.

Remember that there is a danger of electrical shock from any electrical device that has been flooded; consult a certified electrician. Rubber boots and gloves are not adequate protection from electric shock.

Well disinfection will not provide protection from pesticides, heavy metals and other types of non-biological contamination. If such contamination is suspected, due to the nearness of these contaminant sources, special treatment is required.

Information on home water treatment units (also called point-of-use and point-of-entry units) is available from U.S. EPA by phoning the **Safe Drinking Water Hotline (1-800-426-4791)**.

If you observe chemical containers (including barrels and drums) that have moved to your property, call your state or county health department or the **Superfund Hotline (1-800-424-9346)**.

For information on long-term water quality conditions in the area, consult the state or county health department.

Well owners may have information about the construction, or testing of their well and this information will be helpful to the health department in determining water quality conditions.

Septic systems should not be used immediately after floods. Drain fields will not work until underground water has receded. Septic lines may have broken during the flood.

United States Environmental Protection Agency

How to Dispose of Medicines Properly

DON'T: Flush expired or unwanted prescription and over-the-counter drugs down the toilet or drain unless the label or accompanying patient information specifically instructs you to do so.

DO: Return unwanted or expired prescription and over-the-counter drugs to a drug take-back program or follow the steps for household disposal below.

1ST CHOICE: DRUG TAKE-BACK EVENTS

To dispose of prescription and over-the-counter drugs, call your city or county government's household trash and recycling service and ask if a drug take-back program is available in your community. Some counties hold household hazardous waste collection days, where prescription and over-the-counter drugs are accepted at a central location for proper disposal.

Courtesy: Upper Watauga Riverkeeper and Appalachian Voices

Drug Take-Back Event

2ND CHOICE: HOUSEHOLD DISPOSAL STEPS*

1. Take your prescription drugs out of their original containers.

2. Mix drugs with an undesirable substance, such as cat litter or used coffee grounds.

3. Put the mixture into a disposable container with a lid, such as an empty margarine tub, or into a sealable bag.

4. Conceal or remove any personal information, including Rx number, on the empty containers by covering it with permanent marker or duct tape, or by scratching it off.

5. The sealed container with the drug mixture, and the empty drug containers, can now be placed in the trash.

* Drug Disposal Guidelines, Office of National Drug Control Policy, October 2009

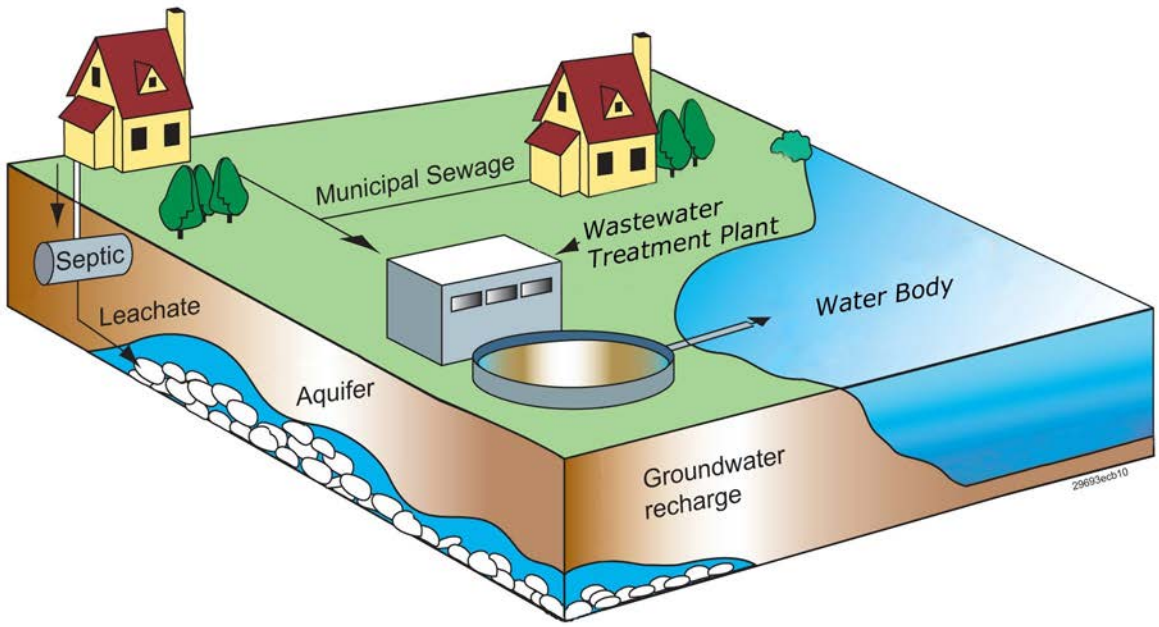
How Proper Disposal of Medicines Protects You and the Earth:

- Prevents poisoning of children and pets
- Deters misuse by teenagers and adults
- Avoids health problems from accidentally taking the wrong medicine, too much of the same medicine, or a medicine that is too old to work well
- Keeps medicines from entering streams and rivers when poured down the drain or flushed down the toilet

How Improper Disposal of Medicines May End Up in Our Drinking Water Sources

In homes that use septic tanks, prescription and over-the-counter drugs flushed down the toilet can leach into the ground and seep into ground water.

In cities and towns where residences are connected to wastewater treatment plants, prescription and over-the-counter drugs poured down the sink or flushed down the toilet can pass through the treatment system and enter rivers and lakes. They may flow downstream to serve as sources for community drinking water supplies. Water treatment plants are generally not equipped to routinely remove medicines.



For more information, go to www.epa.gov/ppcp/
Or call the Safe Drinking Water Hotline at 800-426-4791

Septic Systems—What to Do after the Flood

Where can I find information on my septic system?

Please contact your local health department for additional advice and 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.

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 drink well water until it is tested. Contact your local health department.
- 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.

1. What are some suggestions offered by experts for homeowners with flooded septic systems?

2. 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 fails.

3. 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.

4. 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.)

5. 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.

6. 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.

7. 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.

8. 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.

Flood water can make the air in your home unhealthy.

This is because when things get wet for more than 2 days they usually get moldy. There may also be germs and bugs in your home after a flood.

When cleaning wear

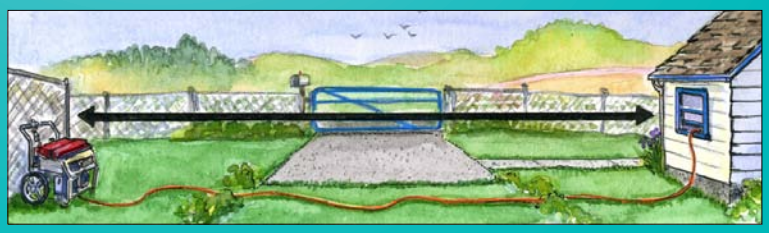
- ✓ An N-95 respirator (Hardware stores usually sell them.)
- ✓ Goggles
- ✓ Gloves
- ✓ Long pants, long-sleeved shirt, and boots or work shoes

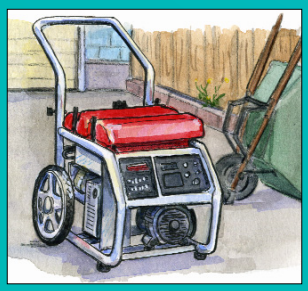
Clean and dry your house and everything in it.

Clean and dry hard surfaces. Throw away anything that was wet with flood water and can't be cleaned.

Flood Cleanup and the Air in Your Home

Use portable generators OUTSIDE and far away from the building.





Portable Generator

The exhaust, or fumes, from a portable generator could kill you in minutes if you breathe it in!

EPA

For more information contact the U.S. Environmental Protection Agency (EPA) free hotline

1-800-438-4318

or go to the EPA website

www.epa.gov/iaq/flood

EPA 402-H-07-001

Resources for You in the Aftermath of Hurricane Harvey

Our regional offices are up and running to assist you

TCEQ Customer Service and After-Hours Line:
1-888-777-3186

Texas residents can use this line to report environmental complaints or concerns. During regular business hours, calls will be routed automatically to the closest TCEQ regional office. Callers after business hours will be directed to an answering service that will get your message to the TCEQ immediately.

Los hispanohablantes pueden llamar al 1-888-777-3186.

Find TCEQ Guidance and Resources on the Web

Visit our main hurricane response webpage:
www.tceq.texas.gov//response/hurricanes

Here are some of the documents we've posted to assist you:

- Hauling hurricane-related debris to the curb in participating areas: <**go.usa.gov/xR688**>
- After the flood, is your water safe to drink? <**go.usa.gov/xR68R**>
- Disinfecting your private well: <**go.usa.gov/xR68Q**>
- How to sample your well water and understand the results: <**go.usa.gov/xR68E**>
- Status of systems in areas affected by Harvey: <**www.tceq.texas.gov/goto/harvey**>

TCEQ

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

9/6/2017

OSHA® FactSheet

Asbestos

Asbestos is a naturally occurring mineral fiber. It was used in numerous building materials and vehicle products for its strength and ability to resist heat and corrosion before its dangerous health effects were discovered. Individual asbestos fibers cannot be seen by the naked eye, which puts workers at an increased risk. The Occupational Safety and Health Administration (OSHA) has regulations to protect workers from the hazards of asbestos.

What is the hazard?

Asbestos fibers are released into the air during activities that disturb asbestos-containing materials.

The asbestos fibers can then be inhaled without knowing and trapped in the lungs. If swallowed, they can become embedded into the digestive tract as well.

Asbestos is a known human carcinogen and can cause chronic lung disease as well as lung and other cancers. Symptoms and/or cancer may take many years to develop following exposure.

Where is the hazard?

The hazard may occur during manufacturing of asbestos-containing products; performing brake or clutch repairs; renovating or demolishing buildings or ships; or cleanup from those activities; contact with deteriorating asbestos-containing materials and during cleanup after natural disasters.

Some materials are presumed to contain asbestos if installed before 1981. Examples of these materials, as well as other presumed asbestos-containing materials are:

- Thermal system insulation
- Roofing and siding shingles
- Vinyl floor tiles
- Plaster, cement, putties and caulk
- Ceiling tiles and spray-on coatings
- Industrial pipe wrapping
- Heat-resistant textiles
- Automobile brake linings and clutch pads

OSHA Standards

OSHA has three standards to protect workers from the hazards of asbestos depending on the type of workplace. For complete information on all of the requirements, see the standard specific to your type of workplace:

General Industry: 29 CFR 1910.1001 covers work in general industry, such as exposure during brake and clutch repair, maintenance work, and manufacture of asbestos-containing products.

Shipyards: 29 CFR 1915.1001 covers construction, alteration, repair, maintenance, renovation and demolition of structures containing asbestos during work in shipyards.

Construction: 29 CFR 1926.1101 covers construction, alteration, repair, maintenance, or renovation and demolition of structures containing asbestos.

What protections exist in the Standards?

- **Permissible Exposure Limit (PEL)** for asbestos is 0.1 fiber per cubic centimeter of air as an eight-hour time-weighted average (TWA), with an excursion limit (EL) of 1.0 asbestos fibers per cubic centimeter over a 30-minute period. The employer must ensure that no one is exposed above these limits.
- **Assessment** of workplaces covered by the standards must be completed to determine if asbestos is present and if the work will generate airborne fibers by a specific method under each standard.
- **Monitoring** necessary to detect if asbestos exposure is at or above the PEL or EL for workers who are, or may be expected to be exposed to asbestos. Frequency depends on work classification and exposure. The construction and shipyard standards require assessment and monitoring by a competent person.

- If the exposure has the potential to be above the PEL or EL, employers must use proper **engineering controls and work practices** to the extent feasible to keep it at or below the PEL and EL. Where feasible engineering controls and work practices do not ensure worker protection at the exposure limits, employers must reduce the exposures to the lowest level achievable and then supplement with proper **respiratory protection** to meet the PEL. The construction and shipyard standards contain specific control methods depending on work classification, and the general industry standard has specific controls for brake and clutch repair work.
- **Proper hazard communication and demarcation** with warning signs containing specified language in areas that have exposures above the PEL or EL is necessary. No smoking, eating, or drinking should occur in these areas and proper PPE must be provided and used to prevent exposure.
- **Separate decontamination and lunch areas** with proper hygiene practices must be provided to workers exposed above the PEL to avoid contamination.
- **Training** requirements depend on the workplace exposure and classification. Training must be provided to all workers exposed at or above the PEL before work begins and yearly thereafter. All training must be conducted in a manner and language in which the worker is able to understand. Workers who perform housekeeping operations in buildings with presumed asbestos-containing materials but not at the PEL must also be provided asbestos awareness training.
- **Medical surveillance** requirements are different depending on the industry. Medical surveillance must be provided for workers who engage in certain classifications of work, or experience exposures at or above the PEL in construction and shipyards. In general industry, medical examinations must be provided for workers who experience exposure at or above the PEL.
- **Records** must be kept on exposure monitoring for asbestos for at least 30 years, and worker medical surveillance records retained for the duration of employment plus 30 years. Training records must be kept for at least 1 year beyond the last date of employment.

Contact OSHA

For more information on this and other health-related issues impacting workers, to report an emergency, fatality or catastrophe, to order publications, to file a confidential complaint, or to request OSHA's free on-site consultation service, contact your nearest OSHA office, visit www.osha.gov, or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

Worker Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- Get copies of test results that find and measure hazards.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules.
- OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation or discrimination.

For more information, see OSHA's workers page.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

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TCEQ GENERAL INFORMATION
Water Supply Division
GI-432 • June 2017

Disinfecting Your Private Well

Is Your Well Flooded? Disinfect It Before You Drink It!

If your private well is flooded, do not use water from it until the following three things have occurred:

1. The floodwaters have receded from the well and your plumbing system.
2. You have disinfected the well and your plumbing.
3. You have sampled your water and received a lab report confirming that the disinfected water contained no bacteriological contaminants.

In these instructions we provide information on how to disinfect your well and your household plumbing system and how to sample the water for analysis by a bacteriological laboratory.

You can use these steps any time you suspect that your well has become contaminated by harmful bacteriological contaminants, not just after a flood.

You also have the option of choosing to hire someone to disinfect and test the water from your well.

Before You Begin

Know the hazards

Be aware of the possible hazards involved in disinfecting your well:

- You will be working with water and electricity. Use the appropriate precautions to avoid electrical shock.
- You will be using liquid bleach or solid calcium hypochlorite. These chemicals can burn your skin and eyes and whiten your clothing if handled improperly. Read the manufacturer's warnings on the label and take the recommended precautions.

Find another source of water

Before you start, make sure you have enough drinking water from another source for all the drinking, cooking, and bathing you will need to do for at least 12 to 24 hours. Consider these options for other sources:

- Bottled water.
- Water from some other source that is known to be uncontaminated.
- Water that you boil before use. If you choose to boil water, heat it to the boiling point and let it continue at a full boil for two minutes. Let it cool before using it for drinking or bathing.

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- Water that you have disinfected another way. Find information about disinfecting water at EPA's Emergency Disinfection of Drinking Water webpage at <www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>.

You also need to have some extra water available to flush toilets, but that does not have to be drinking water.

Know how long you need

Allow time for disinfecting your well and plumbing system, and for sampling and analysis:

1. **Disinfect the well itself:** about an hour and a half.
2. **Disinfect the rest of your plumbing:** 12 to 24 hours.
3. **Flush the system:** varies; about 5 to 10 minutes per faucet.
4. **Sample the water and send it to the lab:** about 15 minutes.
5. **Get the results back from the lab:** about two days.

Sampling the water is very important. You shouldn't drink or cook with water from your well until a bacteriological lab confirms that the water is free of harmful germs.

How to Disinfect Your Well and Plumbing System

Gather the information and materials you will need.

Locate on your property:

- The power switch to your well pump.
- The power to your water heater.
- The wellhead. (This is the concrete pad on top of the well. It might be in your pump house or just outside somewhere. It generally has a pipe sticking out that goes to your pressure tank.)
- The faucet nearest to the wellhead. (This should be a water tap that you can hook a garden hose to.)
- If your well is pressurized, locate the pressure release valve. (It might look like a faucet.)
- The well access plug. (It might look like a large bolt.)

Figure 1: The wellhead on your property will typically include a pipe leading to your pressure tank.

Gather these materials:

- Disinfectant: liquid chlorine bleach ("bleach" in the rest of these instructions) or solid calcium hypochlorite.
- A wrench that fits the well access plug.

- A funnel (wide mouthed if you use calcium hypochlorite).
- A garden hose long enough to reach the wellhead from the nearest faucet.

Table: How Much Disinfectant to Use

If your well is this deep:	Use this much bleach:	Or use this much solid hypochlorite:
Less than 100 feet	1 quart	**1/8 cup**
100 to 200 feet	2 quarts (1/2 gallon)	**1/4 cup**
200 to 300 feet	3 quarts	**3/8 cup**
More than 300 feet	**4 quarts (1 gallon) or more**	**1/2 cup or more**

Liquid chlorine bleach

Liquid chlorine bleach is sold as a cleaning product, but not all bleaches will work for disinfecting your well:

- **Don't** use bleach that is scented or odorless—it should have a sharp chlorine odor.
- Find a list of approved brands at <www.tceq.texas.gov/goto/bleach>.
- You may use bleach that is not on this list if it has an NSF (National Sanitation Foundation) seal, as shown in Figure 2, or says "meets NSF Standard 60" on the label.

Figure 2: NSF Seal

The NSF seal. NSF International certifies products for specific uses—for example, bleaches for safely treating drinking water. If you have questions about whether a particular disinfectant is safe to use in your well, call **the NSF at** 800-NSF-8010.

Calcium hypochlorite

Calcium hypochlorite is sold for chlorinating swimming pools. Because it contains more chlorine than bleach, it might be easier to work with, especially if you follow these tips:

- Make sure the calcium hypochlorite you use has an NSF seal or says "meets NSF Standard 60" on the label.
- Get a granular or powdered form, not the large tablets. (They can be hard to break into pieces small enough to fit into the well, and they can be slow to dissolve.)
- If you get a powdered form, be sure it's fresh. (The powder can lose its disinfecting power on the shelf.)

What not to use

Don't use other disinfectants in your well. After all, you want to drink this water! Especially avoid these:

- Scented (or "scentless") laundry bleaches.

- Chlorine-free bleaches.
- Disinfectants designed for hot tubs.

Disinfecting the well

The time needed for this part of the process depends on whether or not you have a pressurized well. If your well has a screened vent at the wellhead, or if you haven't used an air compressor to maintain water pressure, your well is probably not pressurized.

Disinfecting a pressurized well

This process takes at least 12 hours:

1. Turn off the power to the well pump and air compressor.
2. At the wellhead or pump house, find the pressure-release valve. Before you open it, be sure that you are in the open and breathing fresh air, not the vented air, which may contain hydrogen sulfide, methane, or other gases that sometimes can build up in wells.
3. Open the valve to release all the pressure in the well.
4. Remove the access plug. (You'll need to replace it later.)
5. Put the funnel in the opening where you removed the access plug.
6. Pour in the bleach or calcium hypochlorite. (See the table on page 3 for the right amount to add.)
7. Replace the access plug. Let the well sit for at least 12 hours. During this waiting period:
    - Following the manufacturer's directions, turn off the power to your water heater and drain it.
    - Drain any other water-storage tanks that are connected to your plumbing system.
    - If you can, collect at least some of this water (for example, in 5-gallon buckets) to use whenever anyone needs to flush a toilet during the rest of the disinfection process.
    - Read the rest of these instructions—especially "How to Sample Your Water and Understand the Results" on page 6. You can save yourself some time later by finding a water-sampling kit now.
8. When the 12-hour waiting period is over, turn on the power to your well pump and air compressor.

More than you can do?

If you are not comfortable carrying out these steps, contact a professional water-well driller to perform them for you.

Disinfecting a non-pressurized well

1. Turn off the power to the pump.
2. Remove the access plug.
3. Put the funnel in the opening where you removed the access plug.
4. Pour in the bleach or calcium hypochlorite. (See the table on page 3 for amounts.)

5. Connect the garden hose to the faucet nearest the wellhead.
6. Turn the power to the pump back on.
7. Turn on the faucet and run water through the funnel into the well for one hour. By circulating the chlorinated well water, you will expose all fittings and equipment in the well to the chlorine solution and improve the germ-killing action.
8. During this hour:
    - Following the manufacturer's directions, turn off the power to your water heater and drain it.
    - Drain any other water-storage tanks that are connected to your plumbing system.
    - If you can, collect at least some of this water (for example, in 5-gallon buckets) to flush toilets during the rest of the disinfection process.
    - Read the rest of these instructions—especially "How to Sample Your Water and Understand the Results" on page 6. You can save yourself some time later by finding a water-sampling kit now.
9. After the hour is up, remove the garden hose and funnel and immediately replace the access plug.

Disinfecting your plumbing

To disinfect the rest of your plumbing system, you will fill the pipes with chlorinated water from the well and let it remain at least overnight—if you can, let it remain for 24 hours. For the best results, follow the steps below:

1. Working away from the well, go to the next closest outside faucet. Turn it on, run the water until you can smell the sharp odor of bleach (chlorine), and then turn it off.
2. Repeat step 1 until you have reached all the outside faucets.
3. Refill the water heater, but don't turn the heat back on yet.
4. Refill any water-storage tanks.
5. Go inside and flush each toilet until the water coming in smells chlorinated.
6. Repeat step 1 on each inside faucet. Be sure to include bathtubs, showers, and other faucets and to do this to the cold- and hot-water faucets.
7. If you have a chilled-water line on your refrigerator, run it until you smell bleach.
8. Now that your plumbing system is full of chlorinated water, let everything stand at least overnight or, if you can, for 24 hours to kill germs in your plumbing. During this time:
    - Don't use this water for drinking, cooking, bathing, washing clothes, or washing dishes.
    - You can use this water for flushing toilets, or you can use water collected from draining your water heater. If the toilet isn't clogged, it will flush if you pour in 2 or 3 gallons of water from a bucket.
    - If you have an icemaker, let it run, but dispose of all the ice it produces.
    - Run your empty dishwasher and clothes washer through a full cycle.

Flushing the system

After the chlorinated water has been in your plumbing system for 12 to 24 hours, it's time to flush the system. This process will take about the same amount of time it took to fill the system with chlorinated water—about 5 to 10 minutes per faucet, on average:

1. While you are carrying out the rest of these steps, drain your water heater and any other water-storage tanks connected to your plumbing system.
2. Starting with the outside faucet farthest from your well, open the faucet and run it until you no longer smell chlorine and the water is clear of any debris or color.
3. Working your way back toward the well, continue step 2 with each outside faucet. Don't flush any inside faucets until you have finished outside—otherwise, you might flood the septic system.
4. Flush each toilet once.
5. Repeat step 2 with each inside faucet.
6. If you have a chilled-water line, run it until you no longer smell bleach. Dispose of all of this water.
7. Refill the water heater and any other water-storage tanks.
8. Following the manufacturer's directions, turn the power to your water heater back on.
9. Run a rinse cycle on your dishwasher and your washing machine.

More than you can do?

If this process for disinfecting a well seems like more than you want to handle, call a plumber or licensed water-treatment specialist to have it done for you. While not that complicated, it's important to have the job done right.

How to Sample Your Water for Bacteriological Contaminants and Understand the Results

Now that you have disinfected the well and your plumbing system, there are four steps to getting a valid sample and a meaningful test result:

1. Get the right container and form.
2. Collect the sample.
3. Send the sample to the lab for analysis.
4. Read the lab report and understand the results.

Until you are sure that your water is not contaminated, you shouldn't use it for drinking, cooking, bathing, washing dishes, washing clothes, or household cleaning.

Get a container and form

You have to use a special container to collect a drinking-water sample and complete a special form to send with the sample to a lab for analysis:

- If your area has experienced a hurricane, flood, or other natural disaster, recovery teams may be distributing water-sampling kits. Check with the

county or local emergency-management coordinator in your area to see if you can get the container and form you need.
- If not, call a public health laboratory near you and ask someone to send you a kit for collecting a water sample for bacteriological testing. If you can't reach a lab near you, you can use one that is farther away. It's important to find a lab that can serve you quickly.

Public-health laboratories in Texas

Find the public-health laboratory nearest you on the list of accredited labs in Texas at <www.tceq.texas.gov/goto/certified_labs>.

You may call also call the TCEQ at 512-239-3754 and ask for this information.

Collect the sample

Find a good sampling location. The best site is an outside faucet in the open that does not leak.

- Take the sample at the faucet, not through a hose.
- Avoid sampling from fire hydrants, dirty areas, and areas behind bushes.
- Do not take samples from kitchen or bathroom sinks.
- Try not to sample in high or gusty winds or when it is raining.
- Handle samples carefully! It is easy to contaminate them. Contaminated samples give inaccurate results.

Follow these steps to take the sample:

1. Do not open the sample container yet. Open the faucet to full flow for 3 minutes to clear the line.
2. Reduce the flow to a slow, steady, spray-less stream—about the thickness of a pencil (¼ inch).
3. Be careful not to touch the inside of the container when you open it.
4. Do not rinse the container out—just fill it without splashing.
5. Close and seal the container. Make sure it doesn't leak—leaking samples cannot be accepted for analysis.
6. Note the time. (You will need to enter this on the form you send in with the sample.)

Send the sample to the lab

Don't delay! Your sample must arrive at the laboratory no more than 30 hours after you collect it. But first complete the form and pack the sample properly. If you have questions about this, ask the lab.

Fill out the submission form

With your sampling container, there will be a bacteriological submission form. Here's how to complete it for a private well:

- For "Name of Water System," write "Private."
- For "County," write in the name of your county.
- For "Send Results To:" enter your name and mailing address.

- Enter the date and time that the sample was taken.
- For “Type of System,” write “Individual.”
- For “Water Source,” give as much information as you can—for example, the location, diameter, and depth of the well. If you know the aquifer that the well is drilled into, enter that information, too.

Pack and send in the sample

Enclose the sample container in a plastic bag, seal it, and wrap the bag securely in bubble wrap or some other suitable padding. Put it on ice and the form in a box or envelope and send it by express delivery to the lab for analysis.

Check out the results

It should take about two days for the lab to complete its tests and return the results to you. The most important part of the results is the part about coliform organisms. There are three possible outcomes:

1. **Coliform organisms not found.** This is good news: As far as levels of harmful bacteria are concerned, your water is considered safe to drink at the time of sampling.

2. **Coliform organisms found.** This is not good news. Coliform organisms are present in your water, and it might not be safe to drink. Here is what to do:
   - Don’t use the water for drinking, bathing, cooking, preparing food, making ice, washing dishes, or cleaning.
   - Instead, boil or disinfect your water before you use it, use bottled water, or get water from another source,
   - If you choose to boil your water, heat it to the boiling point and let it continue at a full boil for two minutes. Let it cool before using it for drinking or bathing.
   - To learn how to disinfect water, go to EPA's Emergency Disinfection of Drinking Water webpage at <www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>.
   - Disinfect the well and repeat the test.
   - Until you get a test result of “coliform organisms not found” from the lab, continue to boil or disinfect your water, use bottled water, or use water from another source.
   - If repeated tests continue to show coliform organisms are present, consider adding continuous disinfection equipment to your well.

3. **Unsuitable for analysis.** This is a gray area: The lab could not draw a conclusion, perhaps because of a sampling error. For example, if you rinse out the container before you collect the sample, the result might be “unsuitable for analysis.” If you get this result, you may choose simply to repeat the test, or you may consider disinfecting the well again before repeating the test.