

Make Water Safe During an Emergency

Tap water may not be safe to drink during an emergency; listen to your local authorities. Use bottled water if possible. If not, use one of the methods below to make it safe. Boiling works best. Water contaminated with harmful chemicals or toxins cannot be made safe by boiling or disinfection.

BOIL

This method will kill bacteria, viruses, and parasites.



Boil your water for 1 minute.

At elevations above 6,500 feet, boil for 3 minutes. Let the water cool.

DISINFECT

This method will kill most viruses and bacteria.

Add 8 drops or a little less than 1/8 of a teaspoon of 5%-6% unscented household bleach to 1 gallon water.

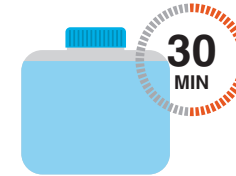
For cloudy tap water, use 16 drops or 1/4 teaspoon



Add bleach to water.



Mix well.



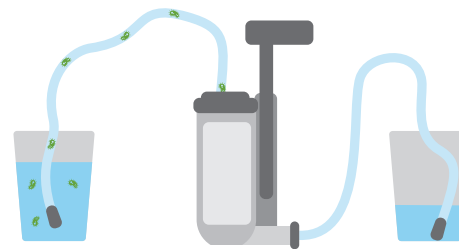
Wait at least 30 minutes before using.

FILTER

This method can remove parasites.

Most portable water filters do not remove bacteria or viruses.

Choose a water filter labeled to remove parasites, and follow manufacturer's instructions.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Learn more:

<https://www.cdc.gov/healthywater/emergency/making-water-safe.html>

SELECTED SLIDES FROM THE
Presentation sponsored by the Third Walnut Creek Mutual (TWCM)
Emergency Preparedness Committee
prepared by Harris R. Greenberg

FEMA Tips for Managing Water

The following web page explains the essentials of managing water:

<https://www.ready.gov/water>

FEMA = Federal Emergency Management Agency

Water Sources: Safe Sources

- **Melted ice cubes.**
- **Liquids from canned goods** - such as fruit or vegetables.
- **Water drained from pipes.** To use the water in your pipes, let air into the plumbing by turning on the faucet in your home at the highest level. A small amount of water will trickle out. Then obtain water from the lowest faucet in the home.
- **Water drained from the water heater.** To use water in your hot-water tank, be sure the electricity or gas is off and open the drain at the bottom of the tank. Start the water flowing by turning off the water intake valve at the tank and turning on the hot-water faucet. After you are notified that clean water has been restored, you will need to refill the tank before turning the gas or electricity back on. If the gas is turned off, a professional will be needed to turn it back on.

Water Sources: Unsafe Sources

- **Radiators** (in a home heating systems).
- **Water from the toilet bowl or flush tank.**
- **Water beds.** Fungicides added to the water or chemicals in the vinyl may make water unsafe to use.
- **Swimming pools and spas.** Chemicals used to kill germs are too concentrated for safe drinking but can be used for personal hygiene, cleaning and related uses.

Cautions about Using Contaminated Water

- **Treat all water of uncertain quality before using it for**
 - drinking,
 - food washing or preparation,
 - washing dishes,
 - brushing teeth or
 - making ice.
- In addition to having a bad odor and taste, **contaminated water can contain microorganisms (germs)** that cause diseases such as
 - dysentery,
 - cholera,
 - typhoid and
 - hepatitis.

Water Treatment Methods

Methods	Kills Microbes	Removes other contaminants (heavy metals, salts, and most other chemicals)
Boiling	Yes	No
Chlorination	Yes	No
Distillation	Yes	Yes

Water Treatment: Boiling

- **Boiling is the safest method of treating water.**
 - In a large pot or kettle, bring water to a rolling boil for one full minute
 - Keep in mind that some water will evaporate.
 - Let the water cool before drinking.
- **Boiled water will taste better if you put oxygen back into it**
 - Pour the water back and forth between two clean containers.
 - This also will improve the taste of stored water.

Water Treatment: Chlorination

- **Use only regular household liquid bleach** that contains 5.25 to 6.0 percent sodium hypochlorite.
- **Do not use scented bleaches, color safe bleaches or bleaches with added cleaners.**
- Because the potency of bleach diminishes with time, **use bleach from a newly opened or unopened bottle.**
- **Add 16 drops (1 teaspoon = 76 drops) of bleach per gallon of water, stir and let stand for 30 minutes.**
 - The water should have a slight bleach odor. If it doesn't, then repeat the dosage and let stand another 15 minutes.
 - If it still does not smell of chlorine, discard it and find another source of water.
- **Other chemicals**, such as iodine or water treatment products sold in camping or surplus stores **that do not contain 5.25 or 6.0 percent sodium hypochlorite as the only active ingredient**, are not recommended and should not be used.

Water Treatment: Distillation

Distillation will kill microbes that resist boiling or chlorination, and distillation also removes heavy metals, salts and most other chemicals.

Distillation involves boiling water and then collection of only the vapor that condenses. The condensed vapor will not include salt or most other impurities.

- **To distill, fill a pot halfway with water.**
- **Tie a cup to the handle on the pot's lid so that the cup will hang right-side-up when the lid is upside-down** (make sure the cup is not dangling into the water).
- **Boil the water for 20 minutes.**
- **The water that drips from the lid into the cup is distilled.**

Where is the connection on your water heater that lets you get safe drinking water out of it in an emergency?

PG&E recently sent out new safety stickers to attach to your water heaters that show emergency numbers to call, and also show where the various lines and connections are located. A copy of one of these is shown below:

PACIFIC GAS & ELECTRIC 1 (800) PGE-5000
EMERGENCY SERVICE UPDATE

EMERGENCY SHUTDOWN INSTRUCTIONS

SAFETY INSPECTION CHECKLIST

- A Check for Leakage & corrosion.
- B Water heater must be earthquake braced.
- C Make sure there is a safety relief valve.
- D Gas connector line must be flexible type.
- E Water heater should be in safety pan as required.
- F Yearly tank flush is recommended.

A trained service technician should perform all maintenance and repairs.

TO AVOID DAMAGE WHEN LEAKAGE OCCURS:

1. **TURN OFF WATER SUPPLY** - Twist handle clockwise until it stops.
2. **TURN OFF GAS** - Twist top dial from "ON" to "OFF" position. For electric water heaters, turn off Circuit Breaker.
3. **DRAIN WATER HEATER IF NECESSARY TO AVOID WATER DAMAGE.** Attach garden hose to drain valve & Open Relief Valve Handle.
4. **CALL (925) 803-8003 FOR SAME DAY SERVICE.**

EARTHQUAKE GAS SHUTOFF

IF YOU SMELL GAS:

1. **LOCATE GAS METER OUTSIDE OF HOME**
2. **TURN GAS VALVE ¼ TURN FROM ON TO OFF**

Gas meter and shut-off valve

TANK FLUSH RECORD									

CALL NOW → (925) 803-8003

WATER HEATER SPECIALISTS
FIRE DEPARTMENT & MEDICAL (925) 933-1313

**24 HOURS
7
DAYS A WEEK**

- On the left side of the sticker the letter F on the diagram is described as the “Tank flush” connection.
- Instruction number 3 to the right of the hot water tank image talks about attaching a water hose to drain the water, and has an arrow pointing to the connection with the letter F label.

If your water heater uses gas, and you smell gas, the diagram on the far right of the sticker also shows you where the gas shutoff valve is located by your gas meter, and tells you how much to turn the shutoff valve.

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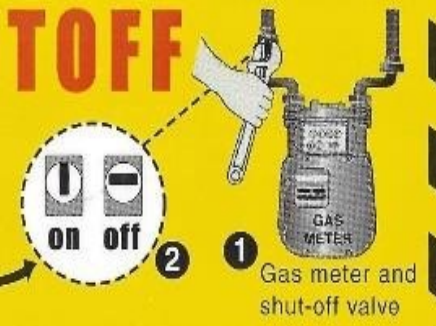
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EARTHQUAKE GAS SHUTOFF

IF YOU SMELL GAS:

- 1 LOCATE GAS METER OUTSIDE OF HOME**
- 2 TURN GAS VALVE 1/4 TURN FROM ON TO OFF**



TANK FLUSH RECORD

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CALL NOW →
FOR SERVICE

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Steps for Getting Water from Your Water Heater

- 1. Turn off the electricity or gas (#2 on the diagram) to the water heater.**
 - Turn off the circuit breaker for electric water heaters or close the gas valve for natural gas and propane types. If the power or gas is still on when the tank is empty, your tank will almost certainly sustain significant damage.
- 2. Preserve the cleanliness of the water in the tank by closing the supply valve to the tank (#1 on the diagram).**
 - When water service is restored, the water department will be pumping water that could be contaminated. This will be fine to use for flushing toilets and for cooking, but not for drinking.
- 3. Find the valve at the bottom of the tank for draining (#3 on the diagram).**
 - This is where your clean drinking water will come from. Many water heater valves have a connector for hooking up a garden hose to the drain valve.
- 4. Turn on the hot water from any tap in the house. In order for water to be drained from the tank, you must allow air to get into it.**
 - This is easy to do by opening any hot water tap in the building such as the kitchen or bathroom sink.
- 5. Remove any sediment that has collected at the bottom of the water heater.**
 - Water heaters are notorious for trapping sediments. The heavier-than-water sediment sinks and collects at the bottom of the tank because hot water is drawn from the top of the tank, rather than the bottom.

Water purification using Counter-top Water Pitcher filters (such as Brita or Pur)

- Most all reputable suppliers of counter-top pitcher water filters comply with National Sanitation Foundation (NSF) standards.
- This means that they are effective in removing a specific list of harmful chemical and mineral contaminants.
- Typical filter life is around 40 gallons of water
- **However, typically none of these water filters are certified to remove biological contamination (bacteria and viruses).**
- If you get a “boil water advisory” for your area, you should boil your water for one minute (and let it cool) even if you run it through a top-rated filter system to improve the taste.

Water Filters Designed for Camping Trips

- Pump and ceramic filter with carbon core (Example: MSR MiniWorks EX Microfilter; around \$90 at Amazon or REI).
 - Small pore filter: 0.2 microns – cartridge life around 525 gallons
 - Uses hand pump to provide pressure (85 strokes per liter)
 - Effective against: protozoa, bacteria, chemicals/toxins, and particulates
 - **Not effective against viruses**
- Membrane microfilter (Example: LifeStraw; around \$35 to \$60 at Amazon or REI).
 - Small pore size: 0.2 microns - cartridge life around 26 gallons
 - Effective against: bacteria, parasites, microplastics, dirt, sand and cloudiness
 - Activated carbon filter protects against chlorine, organic chemical matter, and removes odors
 - **Not effective against viruses**