

Accessing and Purifying Water During Disaster Emergencies

CANNOT SURVIVE WITHOUT WATER!

Plan for one gallon (1 gallon = 4 quarts or ~4 liters or 16 eight-ounce bottles) per person per day: Drink $\frac{1}{2}$ gallon of water per day—more if you are in a hot climate, sick, or pregnant. Use the rest for hygiene. Only use water that has been disinfected for drinking, cooking, making any prepared drink, washing dishes, and brushing teeth. Below are five ways of ridding the water of pathogenic bacteria, viruses, and protozoa. Water that has been contaminated with chemicals cannot be purified and should not be used.

ACCESS

1. **Store 10-14 day supply of water, 1 gallon per person per day.** Don't forget water for pets. You can either:

- Store commercially bottled water and/or
- Store your own tap water
 - ❖ Use 2-liter soda bottles. Rinse well in clean water. Do not use plastic jugs that have had milk or milk products in them.
 - ❖ Fill with tap water. Date the bottle. Store the bottle.
 - ❖ Keep for 6 months then repeat procedure.

2. **Access water from your hot water heater.** Now, *before the disaster*, make sure that the water heater is secured to the wall. If it falls, the water will be lost. Sludge accumulates in hot water heaters so flush them periodically, every 2 years or so. (See separate handout on accessing water from the hot water heater, which is same process for flushing.) A 40-gallon hot water heater will supply a family of 4 for ~10 days.

PURIFY

3. **Use bleach.** (Parts of this section were adapted from the Environmental Protection Agency, EPA, <https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>)

- Another source of fresh water could be Lake Washington or Lake Union or Lake Sammamish. Water from rain barrels can also be used, although generally, flowing water is a better choice than still water. Do not use water that is salty—from Puget Sound or the Pacific Ocean. Avoid grossly contaminated water.
- Disinfection does not work as well if water is cloudy or colored. If there are particles in the water, let the water sit for 30 minutes so particles can settle to the bottom. Next strain the water using a cloth or paper towel, or a coffee filter, or an article of clothing, like socks or hosiery, into a clean container.
- For each gallon of water, add chlorinated bleach (like Clorox), 8 drops of regular-strength bleach or 5 drops of concentrated bleach. Accurately measuring drops may be difficult without an eye dropper, so you can:
 - ❖ Simply dip the corner of a cloth into bleach, then gently squeeze that corner so that drops fall into the water container.
- Allow treated water to stand for 30 minutes. Properly treated water has a slight chlorine odor. If there is no chlorine odor, add the same amount of bleach wait 15 minutes, and recheck for chlorine odor. If the chlorine taste is too strong, pour the water from one clean container to another and let it stand a few hours before use.

4. **Use commercial products.** Travel or outdoor recreation stores have iodine tablets, ultra-violet purifiers, pump-and gravity-filters, all of which would be useful in an emergency kit. Follow specific instructions for each.

5. **Boil water if you have a power source.** If the water is cloudy, or if there is particulate matter, filter it first. Bring to a rolling boil for at least one minute. Above 5,000 feet, boil the water for 3 minutes. Let water cool naturally and store in clean, covered containers. To improve the flat taste of boiled water, add a pinch of salt, or pour it from clean-container to clean-container several times. (From <https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>)

Accessing Water from Your Water Heater

Step 1: Ensure the water in the tank stays clean. If you haven't already shut off water to the house, do that now. If you can't shut off water to the entire house, at least close the valve that allows water to enter the water heater (the supply valve). This will keep potentially contaminated water from sullyng the water in your tank.

Step 2: Cut off power to the tank.

- ❖ **ELECTRIC water heater:** Flip the breaker supplying electricity to the appliance. **RATIONALE:** You're going to drain the tank and you never want to run this appliance without water in it.
- ❖ **GAS water heater:** Shut off the gas to the tank. **RATIONALE:** If you are eyeballing your hot water tank for drinking water you probably can't afford a hot shower.

Step 3: Allow the water to cool. Cooling will take hours!

Step 4: Attach a hose. Near the bottom of the tank is the drain. Attach a washing machine hose or garden hose to it. Do NOT open the valve yet!

Step 5: Break the vacuum. Water won't come out of the tank until air is allowed in. Disconnect the hot water line at the top of the tank. If you can't get the line off, turn on a hot water faucet in the house to allow air into the tank.

Step 6: Collect the water. Open the valve at the bottom of the tank and collect the water in a clean storage container. The first few gallons may contain rust and/or sediment. Let it settle before using it.

Step 7: Treat the water. If you believe that contaminated water has entered your hot water heater, add bleach, stir, and let the water stand for 30 minutes.

- ❖ Regular bleach (5.25%)—Add 8 drops per gallon.
- ❖ Concentrated bleach (8.25%)—Add 5 drops per gallon.

Step 8: When power returns, allow the tank to fill completely before restoring power to the water heater.

Now, BEFORE THE DISASTER:

1. **Secure the water heater to the wall.** If it falls, the water will be lost.
2. **Mark the supply valve.** Run the hot water from any sink. Touch the two pipes attached to the top of the water heater. The "supply" line will be the colder one. Mark the valve as "supply". This supply valve will be the one to close in an emergency so that contaminated water will not go into the tank as you drain the clean drinking water that is stored in it.
3. **Flush the water heater periodically,** every 2 years or so. **RATIONALE:** Sludge accumulates in hot water heaters and can be flushed out. Flushing and accessing water use the same procedure as described above.