

THE BASICS:

KNOW THE RED CROSS RECOMMENDATIONS FOR TREATING WATER IN AN EMERGENCY

By Glenn Meder

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PRINT THIS BOOK OUT IMMEDIATELY. When you need it, you probably won't have power so you will need to be able to reference the hardcopy version. Store it in a safe location. Also, since this is essential information, please give this book away for free to your friends and loved ones.

This is JUST THE BEGINNING of the knowledge you will need to have to keep your family safe and to help others after an emergency. You need to learn to assess your situation and understand how to properly apply these recommendations. We've developed an entire course that gives you the knowledge and understanding you'll need to take care of your family
AND HELP OTHERS after an emergency. Find out more at

EMERGENCYWATER101.COM

Disclaimer: The information provided in this book is designed to provide helpful information on the subjects discussed. The purpose of this book is to provide interested individuals with a higher level of understanding about how and why to provide their family with safe drinking water during an emergency situation. The information in this book is designed to supplement the recommendations provided by the Federal Emergency Management Agency (FEMA) and the American Red Cross, based on the document jointly published by FEMA and the American Red Cross, which is attached in whole at the end of this book. While every effort has been made to ensure that the book is as complete and accurate as possible, there may be mistakes, either typographical or in content. Therefore, this text should be used as a general guide only, and not as an ultimate source of such information. If any of the information or instructions in this book conflicts with statements made in the FEMA/Red Cross document, the user should follow the information provided in the FEMA/Red Cross document. Opinions expressed and information are subject to change without notice. The author, editors and NUSAZ, LLC, and distributors shall not be held liable, nor be responsible to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book and the website.

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INTRODUCTION:

In our society there is a shocking lack of knowledge about water, even by people who should know better. In day to day life this lack of knowledge doesn't affect us very much because we are surrounded by safe drinking water. Simply turn on the tap or go to any convenience store and buy bottled water. Our infrastructure is fantastic. But what happens when that infrastructure is damaged or destroyed by a natural or man-made disaster? Our lack of knowledge of water can be very dangerous. Knowledge is the most important aspect of being prepared.

WHY BE PREPARED?

After a hurricane, earthquake, flood, electrical blackout or other disaster strikes your community the water coming from your tap could become dangerously contaminated, sometimes for long periods of time. Without a supply of safe drinking water, you and your family could become seriously ill within days. By taking some time now, you can protect your family when they need it most.



AFTER A DISASTER STRIKES.

- Tap water may not flow and/or may be contaminated.
- Underground piping may be severely damaged.
- Store shelves could be empty of bottled water.
- Sewage may be backed up.
- Roads may be seriously damaged, preventing emergency response.
- Crowds of people who don't have safe water may panic.
- Communications may be down.
- You may feel terribly alone.
- Your family will be thirsty.

YOU CAN TAKE CARE OF YOURSELF.

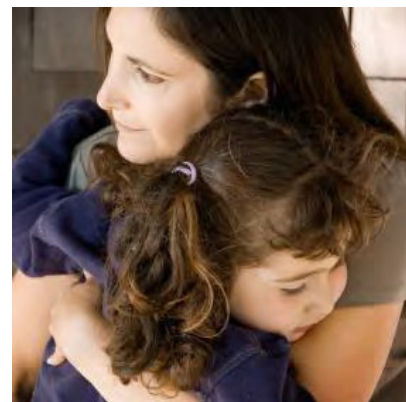
Even if the worst happens, you can take care of your family if you know what to do. Armed with the knowledge in this book, you can save your family's lives and help others in your neighborhood.

YOU DON'T KNOW.

The first thing that you need to know about water in an emergency situation is that even if water looks clean and smells clean, it could still contain dangerous contaminants. Assume that it is contaminated and that it must be properly treated before drinking!

CHILDREN & INFANTS ARE AT GREATEST RISK.

While even the strongest adults can become ill from drinking contaminated water, children and infants are at the highest risk. Infants and children consume more water for their body weight than adults, they become dehydrated faster and their immune systems are not yet developed.



IT'S JUST A STOMACH BUG...

Getting sick from bacteria in the water during an emergency is extremely dangerous. Most people have experienced a stomach bug, which can cause vomiting, diarrhea, dehydration, nausea and severe weakness. In our normal life, such an illness is just an uncomfortable inconvenience. We simply drink plenty of water to rehydrate and sleep it off. But what happens when the only water you have to drink is the water that made you sick in the first

place? If you can't immediately rehydrate, your health can quickly deteriorate.

Imagine being sick and trying to take care of your family. Imagine being sick and not having water to drink. Don't let yourself get in this situation.

THE ANT AND THE GRASSHOPPER.

Remember the story of the ant and the grasshopper? The ant worked hard and saved up plenty of food for the long winter months, while the grasshopper had fun and didn't worry about the coming cold weather. When the winter came, the grasshopper was in the cold and ended up begging for help. Are you the ant or the grasshopper?

None of us know what is coming, but here's what we do know. First, we have seen terrible disasters strike throughout the world in recent years from Hurricane Sandy and Katrina to Typhoon Haiyan in the Philippines to large earthquakes in Christchurch, New Zealand, and Chile to the terrible earthquake, tsunami and subsequent nuclear meltdown in Japan.

But the need goes beyond natural disasters. World events are heating up and are more dangerous today than they have been for generations.

No one can dispute that there are many people and countries who would like to hurt or destroy us. The easiest way to hurt us would be to take down our electrical grid, because if our electrical grid goes down everything else goes down too, including water treatment plants (this is why the electric grid is such a prime target).

Iran, North Korea and other countries know how to bring down our electric grid and have threatened to do it if they are attacked. The easiest way would be with a massive cyber-attack, which has the potential to disable our entire electric grid. Another type of attack could involve an EMP, or

electromagnetic pulse which would not only take down the electric grid, but it would fry all electronics for hundreds of miles around. This would disable trucks, cars, gas pumps, TVs, radios, and anything else that has a computer.

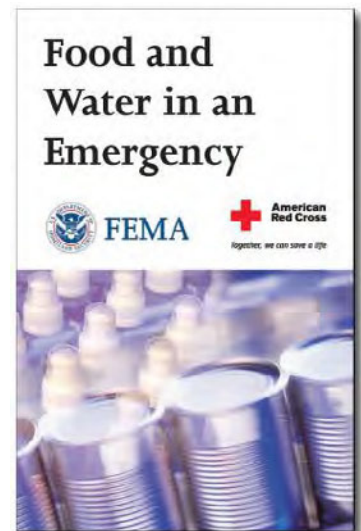
Our society is a finely-tuned machine. It runs fantastically well, but if something serious happens, such as an electrical grid outage, everything stops. Communications stop. Gasoline stops. Food delivery stops. And water treatment systems stop.

Plan ahead and know how to properly treat water so you can provide your family with a long-term supply of safe drinking water during an emergency.

FEMA & THE RED CROSS.

What is the core resource material that you should reference about water in an emergency? FEMA and the American Red Cross have prepared a comprehensive pamphlet titled, "Food and Water in an Emergency" that instructs people how to make water safe to drink during an emergency.

The Red Cross pamphlet is incorporated into this book or if you want to download it from the FEMA website, go here: FEMA/RED CROSS PAMPHLET.



THE RECOMMENDATIONS.

FEMA and the American Red Cross recommend three treatment methods for treating water during an emergency. Here are the three methods, and what they say about each method...

1. **BOILING.** "Boiling is the safest method of treating water. In a large pot or kettle, bring water to a rolling boil for 1 full minute, keeping 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 by pouring the water back and forth between two clean containers. This will also improve the taste of stored water.”

2. **CHLORINATION.** “You can use household liquid bleach to kill microorganisms. Use only regular household liquid bleach that contains 5.25 to 6.0 percent sodium hypochlorite. Do not use scented bleaches, colorsafe 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 (1/8 teaspoon) 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 bleach, 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 to 6.0 percent sodium hypochlorite as the only active ingredient, are not recommended and should not be used.”

3. **DISTILLATION.** “While the two methods described above will kill most microorganisms in water, distillation will remove microorganisms that resist these methods, as well as heavy metals, salts, and most other chemicals. Distillation involves boiling water and then collecting the vapor that condenses back to water. 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), and boil the water for 20 minutes. The water that drips from the lid into the cup is distilled. (See illustration.)”

WHAT IS DISTILLATION?

The easiest way to understand the process of distillation is to look at nature’s hydrologic cycle. Think about this basic question,

“Where does fresh water come from?”

What is the source of all lakes, rivers, streams, glaciers and even underground

aquifers? The answer: rain (and snow). So where does rain come from? Rain comes from the oceans, which are highly contaminated. Nature purifies water through the process of 1) evaporation, 2) condensation and 3) precipitation.



Here’s how it happens. The sun provides heat to the oceans, which causes the water to evaporate. When water changes from a liquid to a vapor it let’s go of the contaminants. The salt and other contaminants stay behind in the ocean while the water vapor is very pure water. The pure water vapor then rises and condenses into clouds. The clouds move inland and release the water as precipitation. Rain is very pure water.

This process of evaporation, condensation and precipitation is water’s built-in purification method. This process never changes, so it will produce the same high-quality water without deterioration in water quality over time.

ANALYSIS OF THE THREE METHODS.

BOILING. While boiling is a good method for killing biological contaminants, it does nothing to remove contaminants that may be in the water. In fact, boiling actually concentrates contaminants that

may be in the water (because the steam that leaves the pot is pure water).

CHLORINATION. Chlorination is also a treatment method that only kills biological contaminants, yet does nothing to remove the contaminants. Chlorination also, obviously, adds a dangerous chemical into the water so it is, from a chemical perspective, making the water more contaminated.

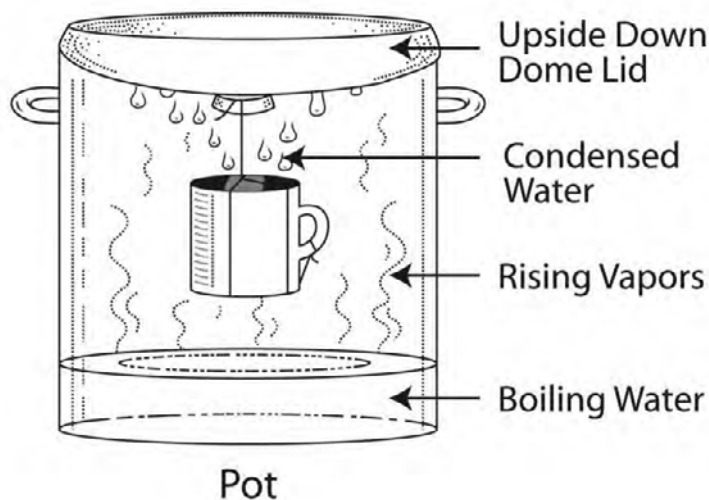
DISTILLATION. Of the three methods recommended by FEMA and the Red Cross, distillation is the only method that kills biological contaminants, while also purifying the water. In addition, unlike filters, there is an air gap that separates the raw contaminants from the distilled water.

DISTILLATION IS THE BEST PROCESS

Distillation is the most secure method of purifying water for consumable purposes during an emergency. Distillation provides the highest level of protection against the full range of possible contaminants, especially biologicals, and is the only process that can reliably purify ocean water. Distillation requires a heat source and fuel.

BUILD YOUR OWN WATER DISTILLER

FEMA and the Red Cross have the following instructions for making your own basic water distiller: 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), and boil the water for 20 minutes. The water that drips from the lid into the cup is distilled. (See illustration.)

Attachment: FEMA/Red Cross Pamphlet about Treating Water in an Emergency. (Cover)

Food and Water in an Emergency



FEMA



**American
Red Cross**

Together, we can save a life



If an earthquake, hurricane, winter storm, or other disaster strikes your community, you might not have access to food, water, and electricity for days or even weeks. By taking some time now to store emergency food and water supplies, you can provide for your entire family.



Emergency Food Supplies

Even though it is unlikely that an emergency would cut off your food supply for two weeks, consider maintaining a supply that will last that long.

You may not need to go out and buy foods to prepare an emergency food supply. You can use the canned goods, dry mixes, and other staples on your cupboard shelves. Be sure to check expiration dates and follow the practice of first-in, first-out.

PREPARING AN EMERGENCY FOOD SUPPLY

As you stock food, take into account your family's unique needs and tastes. Familiar foods are important. They lift morale and give a feeling of security in times of stress. Try to include foods that they will enjoy and that are also high in calories and nutrition. Foods that require no refrigeration, water, special preparation, or cooking are best.

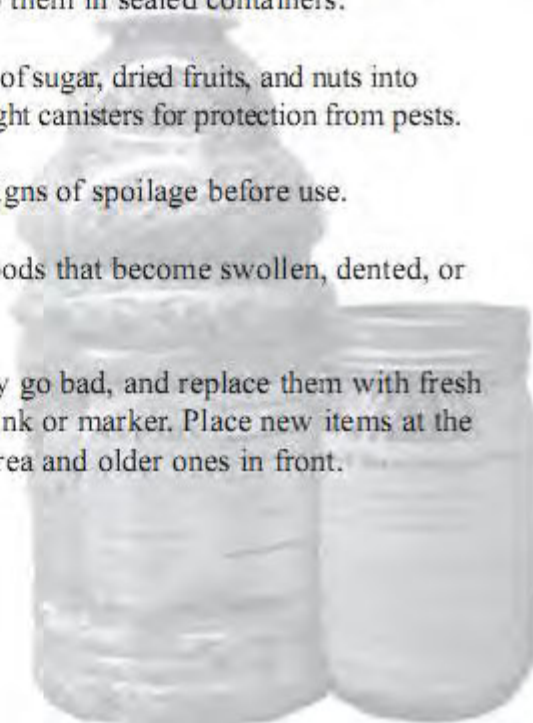


Individuals with special diets and allergies will need particular attention, as will babies, toddlers, and the elderly. Nursing mothers may need liquid formula, in case they are unable to nurse. Canned dietetic foods, juices, and soups may be helpful for ill or elderly people.

Make sure you have a manual can opener and disposable utensils. Don't forget nonperishable foods for your pets.

STORAGE TIPS

- ♦ Keep food in a dry, cool spot—a dark area if possible.
- ♦ Open food boxes and other re-sealable containers carefully so that you can close them tightly after each use.
- ♦ Wrap perishable foods, such as cookies and crackers, in plastic bags and keep them in sealed containers.
- ♦ Empty open packages of sugar, dried fruits, and nuts into screw-top jars or air-tight canisters for protection from pests.
- ♦ Inspect all food for signs of spoilage before use.
- ♦ Throw out canned goods that become swollen, dented, or corroded.
- ♦ Use foods before they go bad, and replace them with fresh supplies, dated with ink or marker. Place new items at the back of the storage area and older ones in front.



SHELF-LIFE OF FOODS FOR STORAGE

The following provides some general guidelines for replacement of common emergency foods.

Use within six months:

- ♦ Powdered milk - *boxed*
- ♦ Dried fruit
- ♦ Dry, crisp crackers
- ♦ Potatoes

Use within one year, or before the date indicated on the label:

- ♦ Canned condensed meat and vegetable soups
- ♦ Canned fruits, fruit juices, and vegetables
- ♦ Ready-to-eat cereals and uncooked instant cereals
- ♦ Peanut butter
- ♦ Jelly
- ♦ Hard candy and canned nuts
- ♦ Vitamins

May be stored indefinitely (in proper containers and conditions):

- ♦ Wheat
- ♦ Vegetable oils
- ♦ Dried corn
- ♦ Baking powder
- ♦ Soybeans
- ♦ Instant coffee, tea, and cocoa
- ♦ Salt
- ♦ Noncarbonated soft drinks
- ♦ White rice
- ♦ Bouillon products
- ♦ Dry pasta
- ♦ Powdered milk – *in nitrogen-packed cans*

IF THE ELECTRICITY GOES OFF...

FIRST...

Use perishable food from the refrigerator, pantry, garden, etc.

THEN...

Use the foods from the freezer. To limit the number of times you open the freezer door, post a list of freezer contents on it. In a well-filled, well-insulated freezer, foods will usually still have ice crystals in their centers (meaning foods are safe to eat) for at least two days. Check to make sure the seal on your freezer door is still in good condition.

FINALLY...

Begin to use non-perishable foods and staples.



HOW TO COOK IF THE POWER GOES OUT

For emergency cooking indoors, you can use a fireplace. A charcoal grill or camp stove can be used outdoors. You can keep cooked food hot by using candle warmers, chafing dishes, and fondue pots. Use only approved devices for warming food. Canned food can be eaten right out of the can. If you heat it in the can, be sure to open the can and remove the label before heating. Always make sure to extinguish open flames before leaving the room.



WHEN FOOD SUPPLIES ARE LOW

If activity is reduced, healthy people can survive on half their usual food intake for an extended period and without any food for many days. Food, unlike water, may be rationed safely, except for children and pregnant women.

If your water supply is limited, don't eat salty foods, since they will make you thirsty. Instead, eat salt-free crackers, whole grain cereals, and canned foods with high liquid content.

NUTRITION TIPS

During and after a disaster, it is vital that you maintain your strength. Remember the following:

- ♦ Eat at least one well-balanced meal each day.
- ♦ Drink enough liquid to enable your body to function properly (two quarts or a half gallon per day).
- ♦ Take in enough calories to enable you to do any necessary work.
- ♦ Include vitamin, mineral, and protein supplements in your stockpile to ensure adequate nutrition.

Emergency Water Supplies

Having an ample supply of clean water is a top priority in an emergency. A normally active person needs to drink at least two quarts (half gallon) of water each day. People in hot environments, children, nursing mothers, and ill people will require even more.

You will also need water for food preparation and hygiene. Store at least one gallon per person, per day. Consider storing at least a two-week supply of water for each member of your family. If you are unable to store this quantity, store as much as you can.

If supplies run low, never ration water. Drink the amount you need today, and try to find more for tomorrow. You can minimize the amount of water your body needs by reducing activity and staying cool.



PREPARE AND STORE AN EMERGENCY SUPPLY OF WATER

To prepare the safest and most reliable emergency supply of water, it is recommended that you purchase commercially bottled water. Keep bottled water in its original container, and do not open it until you need to use it.



Store bottled water in the original sealed container, and observe the expiration or “use by” date.

If You Are Preparing Your Own Containers of Water...

It is recommended to purchase food-grade water storage containers from surplus or camping supplies stores to use for water storage.

If you decide to re-use storage containers, choose two-liter plastic soft drink bottles – not plastic jugs or cardboard containers that have had milk or fruit juice in them. The reason is that milk protein and fruit sugars cannot be adequately removed from these containers and provide an environment for bacterial growth when water is stored in them. Cardboard containers leak easily and

are not designed for long-term storage of liquids. Also, do not use glass containers, because they are heavy and may break.

Preparing Containers

- ♦ Thoroughly clean the bottles with dishwashing soap and water, and rinse completely so there is no residual soap.
- ♦ Additionally, for plastic soft drink bottles, sanitize the bottles by adding a solution of 1 teaspoon of non-scented liquid household chlorine bleach to a quart (1/4 gallon) of water. Swish the sanitizing solution in the bottle so that it touches all surfaces. After sanitizing the bottle, thoroughly rinse out the sanitizing solution with clean water.

Filling Water Containers

- ♦ Fill the bottle to the top with regular tap water. (If your water utility company treats your tap water with chlorine, you do not need to add anything else to the water to keep it clean.) If the water you are using comes from a well or water source that is not treated with chlorine, add two drops of non-scented liquid household chlorine bleach to each gallon of water.
- ♦ Tightly close the container using the original cap. Be careful not to contaminate the cap by touching the inside of it with your fingers. Write the date on the outside of the container so that you know when you filled it. Store in a cool, dark place.
- ♦ Replace the water every six months if not using commercially bottled water.

HIDDEN WATER SOURCES IN YOUR HOME

Safe water sources in your home include the water in your hot-water tank, pipes, and ice cubes. You **should not** use water from toilet flush tanks or bowls, radiators, waterbeds, or swimming pools/spas.

You will need to protect the water sources already in your home from contamination if you hear reports of broken water or sewage lines, or if local officials advise you of a problem. To shut off incoming water, locate the main valve and turn it to the closed position. Be sure you and other family members know beforehand how to perform this important procedure.

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.

To use the 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 a hot-water faucet. 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.

EMERGENCY OUTDOOR WATER SOURCES

If you need to find water outside your home, you can use these sources. Be sure to treat the water according to the instructions on the next page before drinking it.

- ♦ Rainwater
- ♦ Streams, rivers, and other moving bodies of water
- ♦ Ponds and lakes
- ♦ Natural springs

Avoid water with floating material, an odor, or dark color. Use saltwater only if you distill it first. You should not drink flood water.

WAYS TO TREAT WATER

The instructions below are for treating water of uncertain quality in rare emergency situations in the absence of instructions from local authorities when no other reliable clean water source is available and you have used all of your stored water. If you store enough water in advance, you will not need to treat water using these or other methods.

In addition to having a bad odor and taste, contaminated water can contain microorganisms (germs, bacteria, and viruses) that cause diseases such as dysentery, typhoid, and hepatitis. You should treat all water of uncertain quality before using it for drinking, food preparation, or hygiene.

There are many ways to treat water, though none are perfect. Often the best solution is a combination of methods.

Boiling or chlorination will kill most microorganisms but will not remove other contaminants such as heavy metals, salts, and most other chemicals. Before treating, let any suspended particles settle to the bottom, or strain them through layers of paper towel, clean cloth, or coffee filter.

Boiling

Boiling is the safest method of treating water. In a large pot or kettle, bring water to a rolling boil for 1 full minute, keeping 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 by pouring the water back and forth between two clean containers. This will also improve the taste of stored water.

Chlorination

You can use household liquid bleach to kill microorganisms. Use only regular household liquid bleach that contains 5.25 to 6.0 percent sodium hypochlorite. Do not use scented bleaches, colorsafe bleaches, or bleaches with added cleaners. Because the potency of bleach diminishes with time, use bleach from a newly opened or unopened bottle.

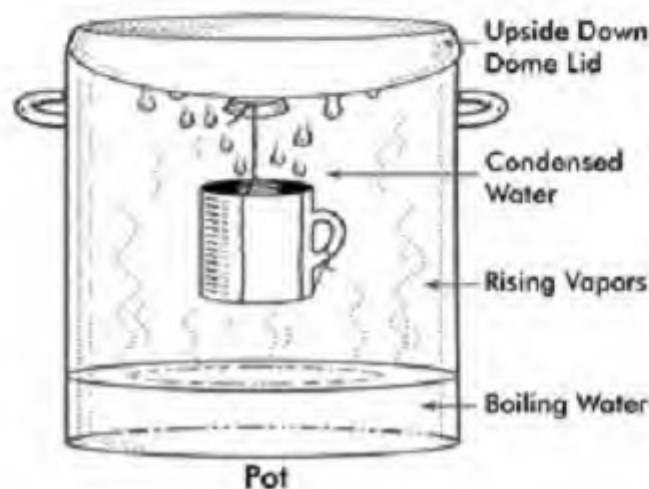
Add 16 drops (1/8 teaspoon) of bleach per gallon of water, stir and let stand for 30 minutes. The water should have a slight bleach odor. If it doesn't, then repeat the dosage and let stand another 15 minutes. If it still does not smell of bleach, discard it and find another source of water.

Other chemicals, such as iodine or water treatment products (sold in camping or surplus stores) that do not contain 5.25 to 6.0 percent sodium hypochlorite as the only active ingredient, are not recommended and should not be used.

Distillation

While the two methods described above will kill most microorganisms in water, distillation will remove microorganisms that resist these methods, as well as heavy metals, salts, and most other chemicals.

Distillation involves boiling water and then collecting the vapor that condenses back to water. 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), and boil the water for 20 minutes. The water that drips from the lid into the cup is distilled. (See illustration.)



Disaster Supplies Kit

In the event you need to evacuate at a moment's notice and take essentials with you, you probably will not have the opportunity to shop or search for the supplies you and your family will need. Every household should assemble a disaster supplies kit and keep it up to date.

A disaster supplies kit is a collection of basic items a family would probably need to stay safe and be more comfortable during and after a disaster. Disaster supplies kit items should be stored in a portable container(s) near, or as close as possible to, the exit door. Review the contents of your kit at least once per year or as your family needs change. Also, consider having emergency supplies in each vehicle and at your place of employment.

The following should be included in your basic disaster supplies kit:

- ♦ Three-day supply of nonperishable food and manual can opener.
- ♦ Three-day supply of water (one gallon of water per person, per day).
- ♦ Portable, battery-powered radio or television, and extra batteries.
- ♦ Flashlight and extra batteries.
- ♦ First aid kit and manual.
- ♦ Sanitation and hygiene items (hand sanitizer, moist towelettes, and toilet paper).
- ♦ Matches in waterproof container.
- ♦ Whistle.
- ♦ Extra clothing and blankets.
- ♦ Kitchen accessories and cooking utensils.
- ♦ Photocopies of identification and credit cards.
- ♦ Cash and coins.
- ♦ Special needs items such as prescription medications, eye glasses, contact lens solution, and hearing aid batteries.
- ♦ Items for infants, such as formula, diapers, bottles, and pacifiers.
- ♦ Tools, pet supplies, a map of the local area, and other items to meet your unique family needs.

Learn More

The Federal Emergency Management Agency's Community and Family Preparedness Program and American Red Cross Community Disaster Education are nationwide efforts to help people prepare for disasters of all types.

For more information, please contact your local emergency management office or American Red Cross chapter. This booklet and the preparedness materials listed below are online at www.fema.gov and www.redcross.org. Other preparedness materials are available at these sites, as well as at www.ready.gov.

These publications are also available by calling FEMA at 1-800-480-2520, or writing:

**FEMA
P.O. Box 2012
Jessup, MD 20794-2012**

Publications with an "A" number are available from your local American Red Cross chapter.

- ♦ Are You Ready? An In-depth Guide to Citizen Preparedness (IS-22)
- ♦ Preparing for Disaster (FEMA 475) (A4600)
- ♦ Preparing for Disaster for People with Disabilities and other Special Needs (FEMA 476) (A4497)
- ♦ Helping Children Cope with Disaster (FEMA 478) (A4499)

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