

Drinking Water Guidelines

 ids.org/topics/food-storage/drinking-water-guidelines

Water Storage

Commercially bottled water in PETE (or PET) plastic containers may be purchased. Follow the container's "best if used by" dates as a rotation guideline. Avoid plastic containers that are not PETE plastic.

If you choose to package water yourself, consider the following guidelines:

Containers

Use only food-grade containers. Smaller containers made of PETE plastic or heavier plastic buckets or drums work well.

Clean, sanitize, and thoroughly rinse all containers prior to use. A sanitizing solution can be prepared by adding 5 ml (1 teaspoon) of liquid household chlorine bleach (5 to 6% sodium hypochlorite) to 1 liter (one quart) of water. Only household bleach without thickeners, scents, or additives should be used.

Do not use plastic milk jugs, because they do not seal well and tend to become brittle over time.

Do not use containers previously used to store non-food products.

Water Pretreatment

Water from a chlorinated municipal water supply does not need further treatment when stored in clean, food-grade containers.

Non-chlorinated water should be treated with bleach. Add 8 drops of liquid household chlorine bleach (5 to 6% sodium hypochlorite) for every 4 liters (one gallon) of water. Only household bleach without thickeners, scents, or additives should be used.

Storage

Containers should be emptied and refilled regularly.

Store water only where potential leakage would not damage your home or apartment.

Protect stored water from light and heat. Some containers may also require protection from freezing.

The taste of stored water can be improved by pouring it back and forth between two containers before use.

Water Purification

If your water supply is not known to be safe or has become polluted, it should be purified before use. Water purification is generally a two-step process.

Step 1: Clarify

Cloudy or dirty water must first be made clear. It should be passed through filter paper, fine cloth, or some other filter. It should be allowed to settle, and then the clear water on top can be carefully drawn. *Filtered or clear settled water should always be disinfected before use.*

Step 2: Disinfect

Boiling Method

Bringing water to a rolling boil for 3 to 5 minutes will kill most water-borne microorganisms. However, prolonged boiling of small quantities of water may concentrate toxic contaminants if present.

Bleach Method

Adding 8 drops of fresh liquid household chlorine bleach (5 to 6% sodium hypochlorite) to every 4 liters (one gallon) of water will kill most microorganisms. Only household bleach without thickeners, scents, or additives should be used. The use of bleach does not address toxic contamination.

Commercial Water Filters

Commercial water filters can effectively filter and purify water contaminated with microorganisms, toxic chemicals, and heavy metals. Their effectiveness depends on design, condition, and proper use.

Kennewick Stake Preparation Committee – Water Treatment and Storage

President Benson: “We do know that the Lord has decreed global calamities for the future and has warned and forewarned us to be prepared. For this reason the Brethren have repeatedly stressed a “back to basics” program for temporal and spiritual welfare. Today I emphasize a most basic principle: home production and storage. Have you ever paused to realize what would happen to your community or nation if transportation were paralyzed or if we had a war or depression? How would you and your neighbors obtain food? How long would the corner grocery store ... sustain the needs of the community?” (Ensign, May 1976, p.124)

Where to Start – How to Approach Preparation

- Follow promptings, common sense
- Follow counsel but realize the Lord/Church doesn't “command in all things”. They teach principles and respect agency
- Spiritual & temporal preparation go together
 - You can't be spiritually prepared without temporal preparation.
- Become familiar with what the prophets have said
- Consider various sources of information
- Ask “what if” questions
 - “What will I do if/when _____?”
 - “How will I deal with _____?”

How to Start

- **Know Your Why!**
- **Lists:**
 - Make a list - Work your lists
 - Include skills
- **Prioritize:**
 - Pray, think, promptings, common sense.
 - Sort list, review & update - have it always in mind
 - Identify the important and urgent
 - Parallel process - multitask
- **Learn & Get Involved:**
 - Skills training (books, internet, blogs, YouTube, etc.)
 - Community and church groups – like-minded people
 - Parallel process – multi-task

Rules for Preparing:

1. Don't go to extremes_- (“looking beyond the mark”*)
2. Don't go into debt (prepare on a budget)
 1. Develop gradually – use plans and prioritized lists
 2. Home production, garden, thrift stores, yard sales, group-buys, on-sale, skills training, etc.
2. Focus on the basics first - (LDS.org, Providentliving.org)
 - a) 3-month pantry: basics, ready-to-eat, off-the-shelf, etc.
 - b) Extended term food storage
 - c) Other: clothing, energy, shelter, medications,
3. Become spiritually prepared – (while temporally preparing)
 - a) Scripture, church activity, temple, FHE, Sabbath day, etc.

- b) Live the Word of Wisdom (improve health, spiritual strength)

Water Safety – Boil Notice

- Tap water isn't drinkable
 - The only safe water is purified by you or is bottled water
- E. Coli, Giardia, Cryptosporidium
- Drinking, bathing, hygiene, teeth brushing
- Cooking, dish washing
- Laundry
- Pets
- Do not drink or use water from any faucet
- Brush teeth with bottled or treated water
- Use hand sanitizer in place of soap and water
- Sponge baths
- Combination water treatment
 - Bleach AND Boiling
- Tape up or disable faucets – make kid-proof
- Use no-rinse bathing wipes
- Store one case bottled water per day for each day of a possible boil notice
- Fill empty containers, jugs, bleach bottles
- Have supply of paper plates, cups, utensils

Water Conservation

- Sanitation: no-rinse bath towels/wipes & baby wipes; hand sanitizer
- Toilet: bag in bucket & toilet; outdoor use or latrine; absorbent kitty litter, etc.
- Showers/baths: sponge baths & wipe-downs
- Cooking: canned no-cook prepared meals
- Gray water re-purposing: flush toilet, filter disinfect and reuse, plants
- Disposables: diapers & pull-ups, paper plates, utensils, towels, napkins, etc.
- Laundry: Minimize laundry needs with underwear liners, body odor control, wear multiple times
- Reduce activity levels and stay cool; limit hot daytime activity
- Avoid beverages that dehydrate (caffeine or alcohol)
- Don't ration water unless authorities order

Water Storage

- How much? FEMA: 1 gallon/person for 3 days
- Crisis Preparedness Handbook: 20-30 gal/person for 2-3 weeks
- Don't use containers previously used for non-food products
- Use food-grade containers

Kennewick Stake Preparation Committee – Water Treatment and Storage

- Rotated – periodically emptied and refilled
- Protect from light, heat, freezing
- Use potable water hoses for large tank filling

Water Containers

- Don't use plastic milk jugs
- Survival Pouches
- 5 gal Bottle
- 5 gal Box
- Waterbrick
- 5 gal Stackable
- 55 gal Barrel
- 250 gal "Super Tanker" tank
- 250 gal Water Bladder
- 750 gal Tank
- Bottled water
- Soda bottles
- Mason jars
- PETE bottles
- Bathtubs, sinks, buckets
- WaterBob, AquaPod
- Garbage can / trash bag
- Rain barrels

Preparing Water

- Filter: Distill, Reverse Osmosis, Gravity filter (Berkey, ceramic, biologic), Lifestraw, etc.
- Chemical Tx: Chlorine bleach (8 drops/gal); chlorine granules; Iodine drops
- Heat: Boil for 3 min; Can in water-bath canner or pressure canner

Contaminants

- Hexavalent Chromium
- Fluoride
- Arsenic
- Lead
- Bad Bacteria
- Viruses
- Parasitic Protozoa
- Parasitic Worms
- Chemicals & Pharmaceuticals
- Toxic Plants, Algae
- Dead Animals
- Animal Feces
- Minerals
- Turbidity

Water Treatment

- Clarify - Filtration
 - Cloudy/dirty water
 - Remove debris and particulates
 - Filter (filter paper, cloth, 3-stage biologic filter, etc.)
- Disinfect – Purification
 - Objective: remove microorganisms, toxic chemicals, heavy metals
 - Boiling
 - Chemical (chlorine, iodine)
 - Microfiltration

- Storage
 - PETE food-grade containers – cleaned and sanitized (no milk jugs)
 - Rotated and refreshed periodically
 - Away from heat & light; protect from freezing
 - 8 drops liquid chlorine bleach per one-gallon water

Note: Best to combine methods and have redundancies when dealing with water filtration, purification & storage.

Purification

- Boiling & Canning: heat
 - Does not neutralize chemicals or radioactive particles
- Chemical Tx: Drops / Tablets
- Activated Charcoal Filters
- Ultraviolet Light
- Pumps / Micro-Filters (Lifestraw, etc.)
- Distillation

Filtration

- Debris
- Sediment & particulates
- Biologic – bacteria, protozoa, viruses

Liquid Chlorine Bleach

- Kills bacteria and viruses. Not effective against all protozoa
- 2 drops of bleach per quart / 8 drops per gallon. Double for cloudy water.
- Use unscented Clorox bleach or store brand
- Does not neutralize harmful chemicals or radioactive particles
- Shorter shelf life (than dry bleach granules)

Dry Chlorine Bleach / Granules

- Shock treatment used in swimming pools
- Kills bacteria and viruses, not effective against all protozoa
- Does not neutralize harmful chemicals or radioactive particles
- 1/96th of an ounce (pinch between thumb and finger) of 68% calcium hypochlorite granules per 1 gallon; wait one hour, smell faint chlorine, if no smell repeat
- Dissolve one ounce of 68% granules in one-pint of water - makes 5.25 liquid bleach solution
- Shelf life of granules is up to 5 years if protected from moisture and humidity

Sources:

- <https://www.ready.gov/water>
- <https://www.fda.org/topics/food-storage/drinking-water-guidelines?lang=eng&old=true>
- <https://commonsensehome.com/emergency-water-storage/>
- www.Providentliving.org

Search Google, Pinterest, YouTube



KATADYN (lots of different backpacking water filters)

--13,000 Gallons --filters to 0.2 microns

-- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals) --Does NOT filter all Viruses

--Good for back country

Price: \$286 (other versions are less \$\$)



LIFESTRAW (also bigger version available LIFESTRAW FAMILY that filter to 0.02 Micron)

--792 Gallons (3000 Liters)

-- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals)

-- filters to 0.2 microns (Does not filter all viruses)

-- Good for back country

-- Price: \$15 (LifeStraw Family \$67)



Berkey Water filters

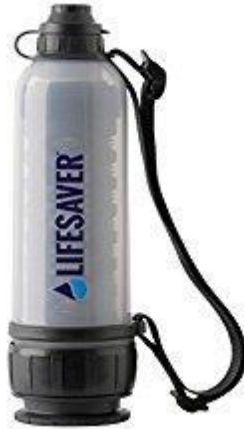
--3000 gallons/filter for total 6000 gallons

---- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals), VOC's and Organic Chemicals, and Viruses

--Not Practical for Backpacking. Good for basecamp and large groups.

--One of the best filtering systems on the market.

--Price: \$300-\$350. (Homemade Berkey \$175)



LIFESAVER WATER BOTTLE (6000 liter bottle and 4000L)

--6000 Liters or 1500 Gallons

--Filters to 0.015 Microns

---- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals) and Viruses

--Good all around Filter for most situations

Price: \$119 (4000L \$109)



LIFESAVER JERRY CAN (20,000Liter)

--20,000 Liters or 5,300 gallons

--Filter identical to LIFESAVER Water Bottle

--Not practical for backpacking, but excellent for basecamp or large group of people

Price: \$235



SAWYER MINI WATER FILTER (many different filters on the market)

--An amazing 100,000 Gallons

--Filter to 0.1microns

---- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals) and but NOT all Viruses

--Good for Backpacking and overall use

Price: \$22



SEYCHELLE WATER BOTTLE (sold by the church)

--filters to 100 Gallons

----- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals), Organic chemicals, VOC's, Viruses and Radiological elements.

Price: \$30



Lifedefender Straw filter (396 Gallons)

--Filters to 0.01microns

--Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals)

--Viruses??

--Price: \$20



Aquapura Water Filter (400 Gallons)

--Filters to 0.01microns

-- Filters Bacteria, Protozoa, Parasites, Algae and Inorganic chemicals (metals)

--Viruses??

--Price: \$15



SteriPen Ultra UV Water Purifier

---- Kills All Bacteria, Protozoa, Parasites, Algae and Viruses

- For use when viral contamination is suspected

Price: \$90 (15,000 Liters)

What Do Water Filters Treat?

Good survival filters have a micron rating of at most 0.2. This allows them to catch all bacteria, protozoa, parasites, and some inorganic chemicals (such as heavy metals).

You might not be able to see them, but trust me – even “clean” looking backcountry water can be ridden with pathogens! Even tap water can harbor pathogens, such as during power outages when water treatment facilities aren’t working.

Most water filters will not treat viruses or organic chemicals (such as benzene, fertilizers, or agents used in a chemical attack). The only purification system capable of removing organic chemicals is [activated carbon](#).(Amazon)

If you are really serious about survival, you’ll keep some of this in your BOB and with your survival supplies.

Treat

- Bacteria
- Protozoa
- Parasites
- Algae
- Inorganic chemicals

Do not treat

- Viruses (unless below .02 microns)
- Organic chemicals (exception Berkey)

When Viruses May Be an Issue

The good news is that viruses usually aren't a problem in backcountry water. Only cholera and polio are able to survive and reproduce in water (at least for now with the rise of [superbugs](#)), and even then the UV light from the sun usually can kill bacteria.

The only times you really need to worry about viruses in contaminated water are:

1. In urban areas where there is sewage contamination in the water source
2. After severe flooding (again because of possible sewage contamination)
3. In undeveloped countries where water may be contaminated by poor sanitation
4. In very popular backcountry areas where [irresponsible campers](#) go to the bathroom too close to a water source

Thus, a water filter is the best choice for most survival and bug out situations. They will give you safe drinking water in virtually all backcountry situations.

If you suspect that viruses are a concern, then you can easily kill them by boiling the water for 1 minute. One more reason to have an [emergency stove](#) in with your survival supplies!

Alternatively, you can [treat water with bleach](#) to kill viruses, or use a water purification system like Steripen.

Just for reference The Hepatitis B Virus is 0.042 microns in length; this is about as small as viruses get. This is the standard for "small" viruses. The smallest virus known to cause disease in humans is Parvovirus B19, which is 20nm in diameter or .02 microns. So if viruses is suspected use a .02 micron water filter or lower. If your filter does not go to .02 microns, then use a steripen to kill all viruses, or use bleach or boil water.

PARTICLE	SIZE (in microns)
one inch	25400
Bacteria	0.3 - 60
Mold	3 - 12
Mold Spores	10 - 30
Viruses	0.005 - 0.3
Anthrax	1 - 5
Asbestos	0.7 - 90
Atmospheric Dust	0.001 - 40
Auto and Car Emission	1 - 150
Beach Sand	100 - 10000
Bromine	0.1 - 0.7
Burning Wood	0.2 - 3
Calcium Zinc Dust	0.7 - 20
Carbon Black Dust	0.2 - 10
Carbon Dioxide	0.00065
Cement Dust	3 - 100
Clay	0.1 - 50
Coal Dust	1 - 100
Coal Flue Gas	0.08 - 0.2
Coffee	5 - 400
Dust Mites	100 - 300
Fertilizer	10 - 1000
Insecticide Dusts	0.5 - 10
Lead	0.1 - 0.7
Lead Dust	2
Mist	70 - 350
Oil Smoke	0.03 - 1
Oxygen	0.0005
Paint Pigments	0.1 - 5
Pesticides & Herbicides	0.001
Pollens	10 - 1000
Radioactive Fallout	0.1 - 10
Red Blood Cells	5 - 10
Rosin Smoke	0.01 - 1
Sea Salt	0.035 - 0.5
Spanish Moss Pollen	150 - 750
Tobacco Smoke	0.01 - 4