Be Ready With Water Storage

**Why Store Water?**

* Natural disasters – Tornados, Floods, Earthquakes, ice storms, etc.
* Water pipelines break and need repair
* Water treatment plant fails
* No electricity for water pumps to work
* Contaminations from some source – water boiling warnings – average 1 a week in USA and Canada.
* Civil Unrest
* Dam breaks – accidental or terrorism
* Drought
* The Prophets have asked that we do.

**How Do I Store Water?**

* Use ONLY food grade containers – PETE or PET should be on the recycle symbol. (providentliving.org). If food came in it and it has the PET or PETE symbol, then it is safe to use
* Don’t use milk jugs. They won’t last and will leak.
* Use containers with screw-on lids.
* Examples – 5 gallon, 7 gallon, juice bottle, 55 gallon, bottled water, 2 liter soda bottles, water bob, boxed Mylar bags
* Don’t store a bunch of 55 gallon barrels on the same side of your garage it will crack you foundation. Water is heavy!
* Water in a large container may not be easy to take with us if we must evacuate, therefore, we should also have some smaller containers of water.
* Water from a chlorinated municipal water supply does not need further treatment when stored in clean, food-grade containers (providentliving.org).
* Non-chlorinated water should be treated with bleach. Add 8 drops of liquid household chlorine bleach (5 to 6% sodium hypochlorite without additives or thickeners) per gallon of water (providentliving.org).
* Bleach has a shelf life of 6-9 months depending on the temperature at which it is stored. The higher the temperature, the shorter the shelf life.
* Light is the enemy of water as it encourages the growth of living things. Opaque containers work best
* Containers should be emptied and refilled regularly (The jury is still out on how often—between 6 mos-5 years)
* Store where a possible leak will not cause damage in your home
* If containers are on concrete, set them on plywood or thick cardboard
* The flat taste of stored water can be improved by pouring it back and forth between two containers before use. This puts the oxygen back in

**Why Treat Water?**

* Contaminated water can cause severe problems including:
	+ Severe and prolonged diarrhea
	+ Diseases like cholera and typhoid
	+ Parasites such as giardia and cryptosporidium
* Toxins in the water
* Water purification is a process in which all types of impurities, contaminants and pollutants are removed from the water.
* Remember that water in a mountain stream can be contaminated
* You should always purify any water that does not come from a water treatment plant.
* When in doubt purify, it is not worth getting sick over.
* Remember that if your public water source is contaminated, ice in your automatic ice maker will be as well.

**How to Purify Water**

* You may have to use more than one method to purify your water.
* Most purification processes involve multiple steps, and especially when water purifying is done in emergency conditions.
* All methods would require you to filter out the larger impurities before proceeding.
* You may want to let the water set so that any dirt or particles that did not filter out will settle to the bottom.

**Types of Water Treatment**

Filtration:

* You can use cheesecloth, coffee filters or other material to filter out large debris. **It must then be treated by another method**
* You can buy a filter system. Go online to find them.
* The CDC says those that use reverse osmosis are best
* A good two bucket system with a ceramic (silver impregnated) filter can be found at: [www.justwater.me](http://www.justwater.me/) You may be able to find them less expensively from other online sources.
* You can also make your own filter if you want. Lots of sources on the internet to show you how but basically a 2 bucket system where the top bucket has layers of gravel, sand and charcoal to filter out the impurities.
* **Filters need to filter to 0.2 microns to filter out all harmful organisms**

Boiling:

* You can boil water to kill almost everything in it. Just boil for 3-5 minutes.
* Remember the longer you boil the more water you lose.
* Boiling could concentrate toxins
* Boiling does NOT kill Cryptosporidium

Pasteurization:

* Louis Pasteur showed that bacteria are killed at 149° and that is how milk is pasteurized
* So why do people boil water if they don’t have to? Because they don’t know when it hits 149 °
* WAPI or water Pasteurization indicator allows you to do that
* These are reusable and inexpensive. Good thing to have in a 72 hour kit
* WAPI can be ordered at: [www.solarcookers.org](http://www.solarcookers.org/)
* If boiling does not kill cryptosporidium, it stands to reason that pasteurization would not either

Distillation:

* This uses the process of condensation to purify water.
* You boil water in a container and then let the steam or water vapor collect and fall into another container.
* Kills organisms because it has been boiled
* Removes salts and other impurities
* Best option for purifying sea water

MIOX

* Used by the military and was used to purify water after Hurricane Katrina
* It uses salt to make a powerful dose of mixed oxidants which are then added to untreated water
* The mixed oxidants inactivate all organisms including giardia and cryptosporidium
* The devise is very compact
* Need camera batteries and salt.

Ultra Violet—SteriPEN

* This is device that emits Ultra Violet light to destroy microorganisms
* **Water must be filtered or debris could shield organisms**
* No adding chemicals to affect taste or odor
* Several different types:
	+ Some have a rechargeable battery –recharge from electric outlet, computer or portable solar panel
	+ Some use 4 AA batteries-**Do not use Alkaline**- use disposable Lithium or rechargeable nickel metal hydride (NiMH)
* It will treat 16 oz. in 48 seconds or 33 oz. in 90 seconds
* It can be used up to 8,000 times
* This is meant for small amounts of water at one time.
* Good for 72 hour kits

**SODIS –**Solar disinfection

* This method uses the Ultra Violet (UV) rays of the sun to disinfect the water
* First filter the water
* Put water in a small clear plastic bottle (2 liters or less)
* Shake the bottle and then place (laying down on a reflective surface) in the sun for 6 hours if bright sunlight or 2 days if it is cloudy
* Being used in 3rd world countries now

**Chemical Methods**:

Bleach (5-6% Sodium Hypochlorite)

* Never use bleach that has a scent or thickener added to it, it will make you sick
* 8-16 drops per gallon and let sit for at least 30 minutes (8 drops if water is clear, 16 if cloudy)
* There should be a slight bleach scent if not repeat process.
* If you still don’t get the bleach scent throw it out, it is too contaminated to use
* Does NOT kill all organisms

Chlorine Dioxide

* Takes 4 hours to treat water
* Use opaque container or treat in dark area
* Water treated will stay good for about 5 years
* No bad taste (like the iodine)
* DOES kill giardia and cryptosporidium
* Two forms:
	+ Liquid or drops—Aquamira. This comes in 2 bottles that you mix together.
	+ Tablets—Micropur MP1 by Katadyn
* **Very toxic if ingested—Keep from children**

Iodine

* Read the label to see how to use it usually at least 30 minutes
* Light sensitive and must be stored in the dark
* It leaves a bad taste in water
* The water may still be dirty
* Does NOT kill cryptosporidium (a parasite that causes diarrhea)
* Not good for people with thyroid problems or pregnant women to use this
* Many people have iodine allergies and should not use this method

Sources: Much of this information was obtained from Duana Blakey and from [www.providentliving.org](http://www.providentliving.org)