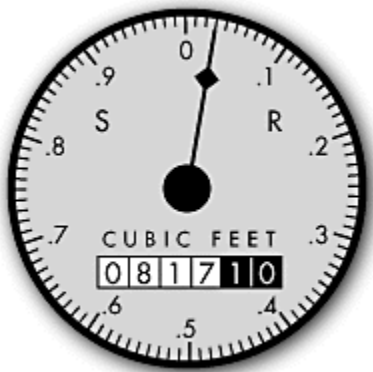


Recommendations for increasing household resilience: Water

Making sure that your household will always be able to function despite reductions or disruption of the municipal water supply involves:

1. Reducing the amount of water that your household requires for comfortable operation in normal circumstances. This reduces pressure on the municipal system and the need for costly expansion of reservoirs or treatment facilities, while reducing your monthly water bill.
2. Reducing the proportion of the water that you do use that comes from the municipal system. Particularly if you have a yard and plants that you water, captured and stored rainwater can be substituted for the water you need to pay for.
3. Storing emergency supplies of drinking water and having the ability to filter or purify untreated water.

The first step in reducing water use is knowing how much water your household currently uses. Berea houses and apartments that are individually metered can read the monthly statements from Berea Municipal Utilities to see monthly water use expressed in cubic feet of water. One cubic foot equals 7.48 gallons. You can read your meter yourself to track your water use at other than monthly intervals.



A straight-reading water meter.

What does your water cost?

Berea Municipal Utility's residential monthly water rates are \$10.00 minimum charge for the first 200 cubic feet (1496 gallons) and \$3.76 for each additional 100 cubic feet (748 gallons). Residential sewer rates are \$6.90 (minimum charge) for the first 200 cubic feet of water used, and \$2.63 for each additional 100 cubic feet.

When you have determined your use, you can compare it to the Kentucky average of 70 gallons per person per day (indoor use only; households served by municipal systems), which is virtually the same as the U.S. per capita daily use.

Average US household water use.

Plumbing fixture or appliance	Use (gallons per person per day)
toilet	18.5
clothes washer	15.0
shower	11.6
faucets	10.9
leaks	9.5
other	1.6
bath	1.2
dishwasher	1.0
Total indoor use	69.3
Average outdoor use	32.0
Total use	101.3

The four main uses of water – toilets, washing machine, shower and faucets – are the places to take [actions to reduce indoor water use](#). Leaks can top other uses, and while a dripping faucet may be obvious, other leaks may be hidden. Read your meter when you leave for the day and no water will be used. If when you return the meter has advanced, there is a leak somewhere in your household plumbing.

If your household has a yard, then there are simple [steps to reduce outdoor water use](#). Many of these have to do with designing your yard to better retain and use rainwater. During dry periods, runoff from your roof, captured and stored in [rain barrels](#) or a cistern can be used to water plants even if municipal water use restrictions are in place. A one-inch rain on a 1000 ft² roof produces up to 623 gallons of runoff, so it is not difficult to fill several 50-gallon rain barrels for future use.

With modest spending on fixtures and water-efficient appliances, and changes in the residents' behavior, most households should be able to achieve 35 gallons per person per day or less for indoor water use. For example, the Olson household, a single-family, in-town house, averages 33 gallons per person per day for combined indoor and outdoor use. This is achieved with low-flow showerheads, low-flush toilets, a front-loading washing machine, and multiple rain barrels.

A more extreme example is the SENS House (www.senshouse.org) in the Berea College Ecovillage. Home to four students, this household averages 10 gallons per person per day, all of which is rainwater from the roof, stored in a cistern, filtered, and UV-sterilized.

In an emergency where the municipal water system fails or becomes contaminated, it is possible to make do with considerably less water: one gallon per person per day as a minimum for drinking, minimal cooking and very basic hygiene. A family of three would need 21 gallons of emergency water supply for a one-week outage. Consider that water is heavy (8 pounds per gallon) and that 21 gallons would occupy almost three cubic feet.

Water can be stored almost indefinitely in opaque, air tight containers of glass or plastic including one- or five-gallon jugs, 50-gallon barrels or one-gallon storage bags. The ability to purify water from rain barrels, streams, or contaminated municipal water will greatly augment your storage. There are many types of filter units and chemical purification kits available. For details on water storage and purification, see the books by Harrison or Bates or Stein listed in the water resources section or do an on-line search.