

wellcare® information for you about

Caring for a Cistern

What is a Cistern?

A cistern is a large tank used to store water. Cisterns can be located either above or below ground, and they come in a range of sizes and shapes with varying features. A below ground cistern can be quite large and tends to be more efficient than an above ground cistern because the surrounding soil provides insulation, reducing the amount of water lost to evaporation. Most cisterns require an additional pump to access water, especially if it is installed below ground. Cisterns also have a cap or cover to keep animals, plants, and insects away from the water.

Many homeowners have cisterns to back up their water well system during dry seasons, and in some cases, a cistern is used as the main source of water for a household. When using a cistern as the main source of water, water can be delivered periodically throughout the year, or supplied by rainwater collection systems. Some families also haul water from a water supply station set up by their community.

How do I maintain my Cistern?

Just like a well, regular inspections and maintenance are important to keep the cistern in tip top shape and make sure the water is safe.

Water Testing

If the cistern is fed by a water well, follow testing recommendations in our wellcare® information sheet on *Well Water Testing*.

When using a cistern as a main source of water, testing for bacteria twice a year (usually spring and fall) is recommended at a minimum. It is also recommended to test for chlorine, total dissolved solids (TDS), pH, nitrate, and Volatile Organic Compounds (VOCs). Your local health department may also have additional recommendations.

Water should be tested immediately if recent test results are not available, there are no records of previous tests, noticeable changes in the taste, color, or odor of your water, or if anyone in the household is pregnant, nursing, or has unexplained illnesses.

Contact your local health department, cooperative extension service office, state environmental agency or the wellcare® Hotline for other water testing guidelines and help finding a local certified water testing laboratory.

If there is any suspicion of contamination, such as odor, taste, or illness, stop drinking or cooking with the water immediately, and do not resume use until testing has proven the water source to be safe. Always seek the advice of your medical doctor if you have any health concerns. See the wellcare® information sheets on these contaminants on our website at www.wellcarehotline.org.

It is very important to read all cautions and instructions before proceeding with the chlorination procedure.

Be careful when handling chlorine solutions. Wear rubber gloves, goggles, and a protective apron. If chlorine accidentally gets on your skin, flush immediately with clean water.

Cleaning and Sanitizing

Cleaning and sanitizing are recommended to maintain a cistern at least once per year to remove sediment and any other contaminants. Cleaning and sanitizing a cistern is not as hard as it may seem. The whole process can be done in minimal time and for a minimal cost.

The following steps can be used to clean the cistern:

1. Remove all debris and water from the cistern.
2. Scrub the inside with a stiff brush and a solution of 1 cup of unscented liquid household bleach (5%-8.25%) mixed with 10 gallons of water.
3. Rinse cistern with clean, safe water, then drain.
4. Refill the cistern with clean, safe water.

When a cistern is cleaned, it needs to be sanitized. However, there are times when your cistern needs to be sanitized without being cleaned if:

- The cistern has just been installed, even if there is no sediment or contaminants at the bottom of the tank.
- Plumbing maintenance work was done inside of the tank (e.g., replacement of valves, pumps). Anyone entering a cistern should wear clean footwear.
- Delivered water that is not safe to drink (non-potable).
- A bacteria test result is positive. If the source of bacteria is not easily found, check the inside of the cistern.

The following information can be used to sanitize a cistern:

1. Ensure all water treatment units, are placed in bypass mode. Follow manufacturer recommendations for treatment system disinfection.
2. Add 3 cups of 5%-8.25% unscented liquid household bleach for every 100 gallons (about 380 liters) of water in the holding cistern to achieve a chlorine concentration of approximately 100 parts per million (ppm) or mg/L.. Table 1 gives the amount of bleach needed by capacity.
3. If the cistern is connected to interior plumbing, open all faucets and run the water until you smell chlorine (bleach).
4. Turn off all faucets and allow the solution to remain in the cistern and plumbing for at least 12 hours.
5. Drain all water from the cistern.
6. Refill the cistern with safe drinking water.
7. Open all faucets and run the water until you do not smell chlorine (bleach).

Table 1: Amount of Bleach to Add by Cistern Capacity

Cistern Capacity* in Gallons	Unscented Household Bleach 5%-8.25%
100	3 cups
200	6 cups
300	9 cups
400	12 cups
500	15 cups

*If you do not know the cistern capacity, use one of the following formulas to determine the capacity:

Rectangular Cisterns:

Gallons = Depth (ft) x Length (ft) x Width (ft) x 7.5
 Liters = Depth (m) x Length (m) x Width (m) x 1,000

Round cisterns:

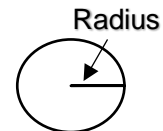
Gallons = Depth (ft) x [3.14 x Radius squared* (ft)] x 7.5
 Liters = Depth (m) x [3.14 x Radius squared* (m)] x 1,000

Notes:

Radius = Half of cistern diameter

Conversion: 1 Liter = 0.264 Gallons (ex: 50 Liters x 0.264 = 13.20 Gallons)

**Radius squared = Radius x Radius*



Chlorine can also be used to maintain the cistern and prevent microbial growth. To maintain the cistern, add 1 tablespoon of 5%-8.25% unscented liquid household bleach for every 100 gallons of water in your cistern. You should have a free chlorine residual between 0.2 ppm to 2.0 ppm. Test your chlorine level frequently. Chlorine test kits can be purchased at most pool supply stores.

Water Treatment

When a cistern is used to store water for household use, many homeowners opt to have filters installed to clean the water before it reaches the home. When used for irrigation, filters are not typically used, since plants are not very vulnerable to algae and other water contaminants.

If you are considering the use of water treatment systems for water purification, consult a local water treatment professional. The type of water treatment required for water purification will vary depending upon the contaminants found in your water. Water testing must be performed first to determine the proper water treatment required. If rainwater is used as a source of drinking, the water should be disinfected before use.

If water treatment systems are already installed, be sure to follow the recommended maintenance schedule or have the systems maintained annually by the company who installed them.

This information sheet is intended to assist you with caring for your cistern. If you have any questions or concerns with your cistern or water quality, consult your water well professional, health department, state agency, or the wellcare® Hotline.

For more information about Caring for a Cistern

Centers for Disease Control and Prevention. Water, Sanitation, & Hygiene (WASH)-related Emergencies. *Cisterns and Other Rain Catchment Systems.*

<http://www.cdc.gov/healthywater/emergency/drinking/disinfection-cisterns.html>

MyHealth.Alberta.ca. Water Safety. *When to Clean and Disinfect Your Cistern.*

<https://myhealth.alberta.ca/Alberta/Pages/When-to-clean-and-disinfect-your-cistern.aspx>

PennState Extension. Water Quality. *Rainwater Cisterns: Design, Construction, and Water Treatment.*

<http://extension.psu.edu/natural-resources/water/drinking-water/cisterns-and-springs/rainwater-cisterns-design-construction-and-water-treatment>

FOR MORE INFORMATION to help you maintain your well and protect your water supply



wellcare® is a program of the **Water Systems Council (WSC)**. **WSC** is the only national organization solely focused on protecting the health and water supply of the 43 million people nationwide who depend on household wells for their water supply.

This publication is one in a series of **wellcare®** information sheets. There are more than 90 information sheets available **FREE** at www.watersystemscouncil.org.

Well owners and others with questions about wells or groundwater can also contact the **FREE** wellcare® Hotline at 1-888-395-1033 or visit www.wellcarehotline.org.

JOIN THE WELLCARE® WELL OWNERS NETWORK!

By joining the **FREE** **wellcare®** Well Owners Network, you will receive regular information on how to maintain your well and protect your well water.

Contact us at 1-888-395-1033 or visit www.watersystemscouncil.org or www.wellcarehotline.org.

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