

Maintaining Your Cistern

Properly maintaining your cistern will ensure your water supply remains clean, potable and ready for use.

Rural Albertans who live in areas of the province where groundwater is low yielding may need to pump groundwater from their well or divert water from a water co-op pipeline into a cistern to store enough water to meet their household needs. Where the groundwater is unsuitable for drinking due to taste, odour or undesirable mineral characteristics, typically an approved water hauler is hired to deliver municipally treated water. A cistern might also be part of a water treatment system such as aeration to remove gas or iron.

Your cistern and stored water are considered a private water supply so it is your responsibility, as a homeowner, to protect it and keep it safe.

What is a cistern?

A cistern is a watertight tank used to store a large volume of water to meet a water demand. To prevent the water from freezing, cisterns are usually buried below the frost level but may also be located inside a heated building. The Canadian Standards Association's (CSA) *Standard B126 Series-13 Water Cisterns* dictates the design, materials, installation and decommissioning standards for modern cisterns. Acceptable materials include steel, concrete, fiberglass or polyethylene. Cisterns must have an access point at ground level, a water-tight lid, a fill port and a vented overflow pipe.

Cisterns come in various sizes. Your water demand dictates the size of cistern you will need. A 15,000 L or 3,300 Imperial gallon cistern will store enough water to meet the demand of an average household of four for two-to-three months. Some situations, such as a low yield well system, will require smaller storage amounts. Bear in mind that the

longer water is stored in a cistern, the greater the risk of microbiological contamination. Keeping your water safe requires periodic testing and inspection, cleaning and disinfection of your cistern.

How do I know the water in my cistern is safe to consume?

Cistern water should be checked twice a week using either test strips or a chlorine test kit you can purchase from a chemical supply company. You need to maintain a free chlorine residual of 0.2 mg/L in the water from your cistern.

If your water comes from a municipally treated source you can restore the chlorine residual by adding 20 mL of new unscented 5 percent bleach for each 1000 L of stored water (about 2 ounces for every 1000 imperial gallons). Chlorine concentration in stored water decays over time and can lead to microbial re-growth. If your cistern is filled with untreated groundwater you need to obtain a chlorine residual by installing a disinfection system such as continuous chlorination.

How often should I test the water in my cistern?

The water from your cistern should be sampled 1-2 times every year for bacteriological quality. If test results show the presence of total coliform or E.coli bacteria, both the cistern and your distribution pipes should be disinfected with chlorine. Total coliform could indicate the chlorine residual in the water is too low or the water has become contaminated.

The presence of E.coli indicates the water is not safe to drink because it has been contaminated with human or animal feces. See the fact sheet *Taking Water Samples* for more information.

Are there other contamination risks?

Insects, rodents and small birds/animals can enter your cistern if there has been any physical damage. Surface water can infiltrate, bringing dirt and other debris. Fertilizer, manure and other chemical or biological contaminants can be carried in by rainwater or snowmelt. CSA's *Standard B126 Series-13 Water Cisterns* requires a cistern be located a minimum 10 meters from a septic tank and 15 meters from a septic field or other sources of contamination such as livestock facilities and chemical storage.

How do I inspect my cistern?

Visually inspect the ground around where your cistern is buried to confirm it is sloped and can divert away rainwater and snowmelt. Inspect the access lid and fill port for a watertight seal.

Look inside the cistern for evidence of dirt, insects or rodents. Look for light coming in from possible cracks or faulty connections. Check the vented overflow pipe is located properly to continuously draw air. Confirm it is down turned, covered with a fine mesh screen cover and high enough not to be submerged under rainwater or snow.

Large roots can become a problem if trees are located too close to your cistern. If any damage is found you should hire a qualified cistern installer to make repairs.



Do I need to clean my cistern?

Routine maintenance of your cistern should include an annual cleaning to remove any build-up of sludge or biofilm. A qualified cistern installer will drain your cistern and physically clean the inside surfaces using a pressure washer or cleaning brushes. They will also remove bottom sludge using a wet-dry vacuum and take care to ensure all equipment is appropriately disinfected prior to use.

Should I shock chlorinate my cistern?

If you pump groundwater from a low yielding well into your cistern you should annually shock chlorinate both the well and cistern. See the fact sheet *Shock Chlorinating Your Well* for more information. Otherwise you should shock chlorinate only if your cistern has been contaminated or you have a confirmed presence of total coliform or E.coli bacteria. Before beginning the procedure be sure to arrange for an alternative supply of water to meet your needs for 12-24 hours.

After cleaning out any sludge build-up from the cistern add enough chlorine to obtain a concentration of 50 ppm while the cistern is being refilled. This can be achieved by adding 1 L of new unscented 5 percent bleach for every 1000 L of stored water. Circulate the chlorinated water through your distribution system by turning on each tap, one at a time, until a chlorine odour is detected at each outlet. Be sure to by-pass any water treatment equipment.

You need to allow for a minimum contact time of 6-12 hours. After this, the chlorinated water can be removed from the cistern by turning on an outside tap, being sure to divert the water away from your septic system and sensitive plants. If your cistern is located in close proximity to a water body, such as a lake front property, you may need to collect and safely dispose of the chlorinated water.

Discharging chlorinated water directly into a water body is a punishable offence under provincial regulation.

When can I refill my cistern?

Once your cistern has been cleaned out or the shock chlorination procedure has been completed you can refill your cistern with potable water. Any remaining chlorine residual in the distribution system will not harm your septic system. Backwash and regenerate any water treatment equipment according to supplier recommendations. It is a good practice to submit a water sample for bacteriological quality after cleaning or shock chlorinating your cistern.

Do I need to treat the water in my cistern?

If your water comes from a treated municipal source no additional treatment should be required as long as you maintain a free chlorine residual of 0.2 mg/L. However, water coming from a low yielding well will need additional treatment. Using a continuous disinfection system is necessary to prevent microbial growth and ensure the water is safe to drink. If UV or ozone disinfection is used instead of chlorine more frequent total coliform testing is required because these systems do not have a residual that can be monitored.



Only hire an approved water hauler to transport and fill your cistern with treated water. Alberta Health Services issues permits to water haulers and regularly inspects their hauling equipment.



Confined spaces pose extreme danger from potentially hazardous gases or low oxygen levels. No one should enter a cistern without proper training in confined space entry and the appropriate safety equipment.

FOR MORE INFORMATION:

Working Well
www.workingwell.alberta.ca

Maintaining Safe Domestic Water Quality with On-Farm Cisterns and Water Tanks
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/wqe11319/\\$FILE/cisternstorage.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/wqe11319/$FILE/cisternstorage.pdf)

This Agriculture and Agri-Food Canada publication explains how to maintain safe drinking water in rural homes after storage in on-site water tanks and cisterns.

Rural Water Quality Information Tool
<http://www.agric.gov.ab.ca/app84/rwqit>

An on-line tool to help assess the quality and suitability of raw water sources for privately owned and operated water supplies.

CONTACT US:

General Questions?
Alberta Environment and Parks
Information Centre
Phone: 310-3773 toll free

Technical Questions?
Alberta Agriculture and Forestry
Ag-Info Centre
Phone: 310-FARM (3276) toll free