

Cisterns and Below Grade Water Storage Tanks

True cisterns, specifically those that store unapproved sources of water (i.e., roof drainage), are **not** acceptable for potable water systems.

The term “cistern” is often used to describe any below-grade non-pressurized reservoir that provides water storage. Other large, below-grade tanks or reservoirs may be used to store drinking water from approved groundwater, treated surface water, or hauled water sources; however, the Minnesota Department of Health discourages their use. These structures, if not properly maintained, can become a source of contamination to the stored water. MDH recommends the following guidelines are used for maintaining your below-grade water storage.

- The water storage tank must be watertight with smooth interior surfaces. If the water storage tank is cracked or crumbling, discontinue use.
- The water storage tank must be located at least 50 feet from any source of contamination, including sewer line, septic tank, drainfield, or gravesite.
- The water storage tank must not be in an area subject to flooding. The surrounding area should be graded to provide drainage away from the water storage tank.
- The bottom of the water storage tank should be above any observed high water table condition.
- The water storage tank must be accessible for cleaning and maintenance.
- Manhole or other covers should be watertight to prevent the entrance of light, dust, runoff, insects, animals, and other vermin. Openings should have a watertight curb with edges projecting a minimum of 12 inches above-grade. The opening should be provided with a precast, overlapping, steel reinforced, concrete cover at least 4 inches thick, or overlapping, watertight, steel cover at least 3/16- of-an-inch thick. The junction of the cover with the curbing must be made with a watertight gasket. The water storage tank must be provided with a down-turned and screened vent.
- A program must be implemented to maintain the water storage tank in a sanitary condition. The water storage tank must be drained and inspected annually. The walls of the water storage tank should be inspected for the presence of cracks or deterioration. The walls should be washed clean, preferably with a high-pressure pump, to remove any debris which may have deposited on the walls or floor. The walls and floor should be disinfected with a bleach solution. This solution may be prepared by adding 1 cup of bleach to a 5-gallon pail of water. The solution can be sprayed or brushed on the entire interior surface of the water storage tank and left undisturbed for a minimum of 30 minutes. The solution should then be discharged to waste before filling with drinking water. Equipment used for maintaining water storage tanks should be dedicated for this function only.

The source of water must be from a safe source. Where well water is not available, it is recommended that the water be provided from a water hauler that delivers drinking water in accordance with Minnesota Rules Chapter 4720.4000. Records of water purchases shall be kept on the premises. The source of water must meet the requirements of the Safe

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Drinking Water Act. Should there be a change in the water source this Department must be notified. Rainwater or spring water supplies are not approved water sources without additional treatment.

- A chlorine residual should be maintained in the water storage tank and on the distribution system. This chlorine residual will guard against the re-growth of bacteria. Adding ½ cup of bleach (5.25% purity) to 1,000 gallons of water will result in a chlorine residual of about 1.5 milligrams per liter. Do not use bleach that has additives or bleach that is scented. Use fresh bleach. Over time bleach can lose its disinfecting ability.
- The chlorine residual should be measured and recorded weekly.

WARNING: The water storage tank is a confined space. No entry shall be made into the water storage tank without observing all OSHA requirements to ensure a safe working environment. Injury or death may result if appropriate safety measures are not observed.

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To obtain this information in a different format, call: 651-201-4700.