

WHAT IS A CISTERN?

The majority of rural homes in Gallatin County obtain drinking water from wells. In most cases, wells provide an adequate quantity of water for domestic use. There are some cases however, when a well may not produce enough water to meet demands during high use and a cistern may be necessary.

A cistern is a water-tight storage tank that is used to store a large volume of water that is available to help meet household needs.

In our area, water is usually pumped from a well into the cistern for storage. When water is needed it may flow either by gravity or pumping from the cistern to the home. Generally, cisterns in Montana are buried underground to prevent water from freezing.

Many older cisterns were constructed in a similar fashion to septic tanks, a concrete box-like structure with a riser to the ground surface for access.



Newer cisterns are usually made from fiberglass or polyethylene, also with a riser for access from ground surface.



The access riser lid may look similar to that of a septic tank for the wastewater system. If you are not sure which riser lid is for the cistern, it may be helpful to find the septic permit site plan at Environmental Health Services.



RESOURCES

Water Testing

Pick up your water sampling bottles from:
Gallatin Local Water Quality District
215 W. Mendenhall, Ste. 300, Bozeman
406.582.3168

Gallatin City-County Health Department
Environmental Health Services
215 West Mendenhall, Room 108, Bozeman
406.582.3120

Cistern Maintenance Services

Some well drilling and service companies and water treatment service companies provide services for cistern maintenance.

Trash Pumps

Some equipment rental companies have trash pumps available for rent. Talk to the pump provider about what you are trying to do to make sure you get the right equipment to make your tank cleaning easier.

Septic Permit Site Plan

Gallatin City-County Health Department
Environmental Health Services
215 West Mendenhall, Room 108, Bozeman.
406.582.3120



215 W. Mendenhall, Suite 300
Bozeman, MT 59715
406.582.3168
www.glwqd.org

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DRINKING WATER STORAGE CISTERNS



CISTERN MAINTENANCE IS ESSENTIAL FOR SAFE DRINKING WATER



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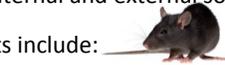
Helping the residents of the Gallatin Valley protect, preserve and improve our surface water and ground water resources.

POTENTIAL PROBLEMS

Drinking water stored in a cistern is at risk for potential contamination from internal and external sources.

Potential contaminants include:

- Insects, spiders, rodents, reptiles, and birds that can crawl or fall into the water along with their waste products.
- Sediment, twigs, leaves and other debris.
- Bacteria, mold and algae can grow within the tank and have the potential to cause illness, taste and odor issues, or clog pipes and other components.
- Fertilizer, manure, and other chemical and biological contaminants can be carried by rainwater or snowmelt that can seep into the ground and into the cistern if it is not properly sealed.
- Corrosion from older metal tanks may contaminate water.



PROBLEM PREVENTION

- Locate cisterns away from potential contaminants: corrals, manure piles, septic systems, etc.
- Avoid using fertilizer and other chemicals in the vicinity of the cistern.
- Ensure the cistern is water-tight. All entry points (riser attachment, lid, pipe inlets/outlets) should be properly sealed.
- The access lid should be properly sealed and protected to prevent children and pets from falling into the cistern.
- The ground around the cistern should be graded to divert rainwater and snowmelt away from the cistern.
- The access riser should terminate above ground level. If possible, high enough not to be submerged under rainwater and snow.
- The cistern should have a vent that is properly located to continuously draw air (not covered by snow). The vent should terminate in a downward position with a fine screen cover to prevent rodents/insects/etc. from entering.
- Disinfect before use!



MAINTENANCE TIPS

Annual water sampling is necessary to determine if your water supply is contaminated. At a minimum water should be sampled for coliform bacteria and nitrates. **Due to the elevated risk of stored water becoming contaminated, full time disinfection is recommended.**



Regular inspection of your cistern is essential to determine if your water supply is protected.

- Visually inspect the ground around the buried tank to ensure rainwater and snowmelt run away from the tank and not over it.
- Inspect the access riser and lid to ensure it provides a water-tight seal to prevent entrance of contaminants.
- Open the lid and look inside the tank for debris (leaves/dirt/insects/rodents/etc.) If you see debris, try to determine how it is getting in.
- Check for light coming in from another source besides the access you are looking through. Light can stimulate algal growth and can indicate a possible entry point for contaminants.
- Look for root intrusion that can damage the cistern and allow contaminants to enter.
- Check the overflow pipe or vent to ensure it is downturned and covered with a fine screen.
- It is recommended to conduct a water-tightness test to determine if there are any leaks from cracks, breaks, or unsealed conduits. A leak can be a point of entry for biological, chemical or physical contaminants.

Drain and clean your cistern at a minimum of every 5 years. Frequency of cleaning should be determined after water sampling and cistern inspection.

CLEANING YOUR CISTERN

Cisterns are confined spaces that may lack adequate oxygen and can be dangerous to enter. Cleaning should be done from the outside.

- Store water for use in the home before cleaning the cistern.
- Drain the cistern.
- Using a clean trash pump and a hose, agitate debris and sediment and pump it out. Pressure washing is not recommended with concrete tanks as it can damage the gasket causing leaks.
- Inspect for any cracks/breaks/leaks.
- Disinfect the cistern after draining and cleaning.



Trash Pump

CISTERN DISINFECTION

- With the cistern at least half full, add 2 gallons of bleach for every 1000 gallons of cistern storage. Purchase unscented bleach with around 6% sodium hypochlorite. Do not use bleach that has been sitting around the home as the effectiveness can decrease over time.
- Mix water and bleach within the cistern with a hose. Rinse the lid and other components with the disinfectant solution.
- Shut off valves to any treatment system (filters, softeners, etc.). Follow manufacturer's disinfection recommendations.
- Once the cistern is filled with the bleach water solution, run hot and cold water from every tap in the home until a bleach odor is detected then turn off the taps.
- Add more water to the disinfectant solution in the cistern to bring the water level to the top.
- Let the disinfectant sit for 24 hours.
- Run enough water to flush the disinfectant out of the pipes and cistern. As the chlorine should not go into the septic tank, divert as much of the flow as possible to a gravel area that will not flow into surface water.
- As chlorine can be corrosive, be sure to rinse all components with fresh water.
- Refill the cistern for use.