

## **MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY SEPTIC SYSTEMS: WHAT ARE THEY AND HOW DO THEY WORK?**

Septic systems are used to treat sewage where public sewers are not available - in low density rural areas. Over the years they have become more common and more reliable. The basic and most common septic system consists of a septic tank, a distribution box and a drainfield (also known as a leachfield or absorption bed/field). These components are usually buried beneath the ground, the only visible indication that they exist may be an access lid to the septic tank. In many cases the lid may also be buried. If your lid is buried or you don't know where your septic tank is located, have it located and install a lid riser so it is easily accessible in case of an emergency.

The wastewater from a home (all the water from sinks, washer machine, dishwasher, toilets, and showers) is diverted into the septic tank. The septic tank is water tight and typically constructed of concrete (fiberglass and plastics can also be used). The septic tank provides the initial treatment of the wastewater by allowing most of the solids to settle to the bottom of the tank and things such as fats, oils and greases to float on top of the wastewater. The solids are slowly decomposed by bacteria that naturally thrive in that environment. However, the bacteria cannot decompose all of the solids. Therefore, a septic tank must be pumped on a regular schedule to remove the remaining solids (the typical interval for pumping is every 3 to 5 years, depending on the amount of use). Septic tank size is based on the number of bedrooms in the home it serves, the minimum size allowed in Montana is usually 1,000 gallons.

Once the heavy and light components of wastewater are separated out in the septic tank, the remaining wastewater (now called effluent) is routed to the drainfield. The drainfield typically consists of two or more laterals of perforated PVC pipe that are laid in gravel-filled trenches or in a gravelless trench (a gravelless trench uses a semi-circular plastic tube that is laid over the PVC pipe to promote even distribution of the wastewater). The drainfield size is determined by the number of bedrooms in the house and on the soil type (less permeable soils require a larger drainfield). A key element to a properly operating drainfield is distributing the effluent evenly through all of the pipes - this is achieved by pumping it to the drainfield from the septic tank under pressure or by using a distribution box above the drainfield that evenly splits the effluent to the multiple pipes. The drainfield and the natural soil beneath it (including naturally occurring bacteria in the soil) provide further treatment by filtering out harmful bacteria and the remaining solids that passed through the septic tank. However, the drainfield and soil do not necessarily provide adequate treatment of all constituents in the wastewater such as nitrogen and other commonly used household chemicals or prescription drugs that are passed into the wastewater system. These other constituents will eventually migrate into the groundwater which is often also the water source for the home or the neighbors, therefore it is important to minimize the amount of chemicals and drugs that are passed to the septic system. There are more advanced septic systems that treat nitrogen better than a basic system, these systems are often referred to as level 2 systems and are required by state regulations in certain situations.

A septic system can last for 20-30 years or more if constructed and operated correctly. Regular maintenance (i.e. pumping out solids and fats/oils/greases from the tank) and minimizing both chemical and solid material discharges (e.g. solvents, paints, drugs, fats, oils, greases, and garbage disposal material) to the system can help extend the life of a septic system.