

## Get to Know Your Septic System

Homeowners with individual on-site septic systems should be familiar with how their septic system functions and how to keep it maintained in order to save costly repairs and to help protect ground water and surface water quality.

There are basically three components to a septic system that make it function properly. The first component is the septic tank, which can be a watertight precast concrete tank used to receive sewage from a dwelling. Sewage is considered to be any water carried domestic liquid waste from toilets, bathing, dishwater, and laundry operations. The septic tank retains the sewage and allows for settling of sewage particles, while at the same time allows for anaerobic treatment to take place. Anaerobic treatment is the digestion and breakdown of harmful viruses and bacteria found in sewage by microorganisms, without the presence of oxygen. By gravity, the sewage flows through a pipe from the septic tank to a drainfield area.

The second component of a septic system is the drainfield, which distributes the sewage effluent over the soil treatment area in the yard.

The third component is the soil treatment area which provides for aerobic treatment of the sewage effluent as it comes in contact with soil particles. Aerobic treatment is the breakdown and digestion of remaining viruses and bacteria from the septic tank by soil microorganisms, in the presence of oxygen. It's important

that there is at least 3' of unsaturated soil conditions below the bottom of the drainfield, so aerobic treatment can occur.

The type of drainfield depends on the soil conditions at a particular location on a property. For example, a standard subsurface drainfield can be installed on a site that has fair to good drainage with a seasonal saturated soil greater than 4' below ground surface. A standard mound type drainfield can be installed on a site that has moderately poor to poor drainage, with a seasonal saturated soil between 1 and 3' below the ground surface and not encountering bedrock or black peat soil conditions. Mound systems require a separate chamber tank with a pump that lifts sewage effluent from the tank to the mound and distributes the effluent throughout the mound under hydraulic pressure. Drywells, cesspools, and seepage pits do not adequately treat sewage but act more as a deep disposal system. Treatment is the key.

Domestic wastewater is 99.9% water with 0.1% pollutants (i.e. viruses and bacteria.) The 0.1% of pollutants is the critical portion of sewage effluent that needs to be treated by soil microbes. Wastewater treatment can be difficult because it is necessary to maintain a high removal efficiency while dealing with large volumes of water. The majority of sicknesses from water borne disease comes from water supplies contaminated by faulty septic systems, according to the U. of M. studies.

Studies show that 3' of sandy loam soil is capable of removing

viruses, bacteria, and the majority of phosphorus found in domestic sewage effluent. However, on-site septic systems generally do not adequately deal with nitrate removal. Nitrates are soluble and will move freely in water. Mound systems can remove 44% - 70% fewer nitrates through treatment compared to a subsurface drainfield.

Homeowners can greatly increase the life of their septic system and save on costly repairs or replacement by following some tips:

- \* Have the septic tank pumped and cleaned by a licensed contractor a minimum of once every three years. (Septic tank additives not recommended.) Maintenance is the key.
- \* Keep off the drainfield area with heavy rubber tire equipment or vehicles, so as not to destroy soil structure and permeability.
- \* Keep solvents, pesticides and household hazardous wastes out of the septic system.
- \* Keep building footing drain tile and water softeners from going into the septic system. These can cause the septic system to overload hydraulically, and cause failure. However, greywater or washwater from clothes washers and dishwashers must go into the septic system. Use liquid detergents over granular detergents whenever possible.
- \* Don't plant trees or shrubs on top of the drainfield

area. Plant root fibers can grow into, or along side of the drainfield and cause it to clog. Grass cover is more preferred.

- \* Make sure dripping faucets are repaired quickly and check to see that toilet tank valves are not sticking on. Most of the water use in a household is from the toilet. Septic systems can only handle a certain amount of water use per day. Knowing what the water use design capacity is for the septic system is important. Installing a water meter to monitor water use is a good idea.
- \* Make sure vent pipes, often located on the house roof, are checked for clogging. Snow and ice can build up in vent pipes during severe cold weather.

The Shoreland Management Ordinance for Pine County has adopted the MN Pollution Control Agency Standards, Chapter 7080, for individual on-site sewage treatment systems. The standards address location, design, installation, use and maintenance of septic systems. The standards are designed to protect the surface and ground waters of the state, while also promoting the public health, safety and general welfare.

For more information about septic systems, please contact the Pine County Land and Zoning Dept. at 629-5600, Ext. 6701; 245-6701; or 1-800-450-7463, Ext. 6701.