

## Septic System Maintenance

by Russell Derickson, *Extension water and natural resources specialist*

Most rural homes use a septic, on-site wastewater treatment system for household waste disposal. In a properly operating septic system, wastes are flushed into a septic tank where heavy solids are trapped and sink to the bottom. Lighter solids float on top of the water and form a scum layer. Anaerobic (without oxygen) bacteria break down wastes inside the septic tank. Water soluble compounds are carried out into a drain field trench where they are absorbed into the soil. Once in the soil absorption field, aerobic (with oxygen) bacteria continue to break down the effluent.

Septic system problems generally fall into three categories:

- improper system sizing,
- clean water infiltration, and
- lack of proper system maintenance.

### Proper System Sizing

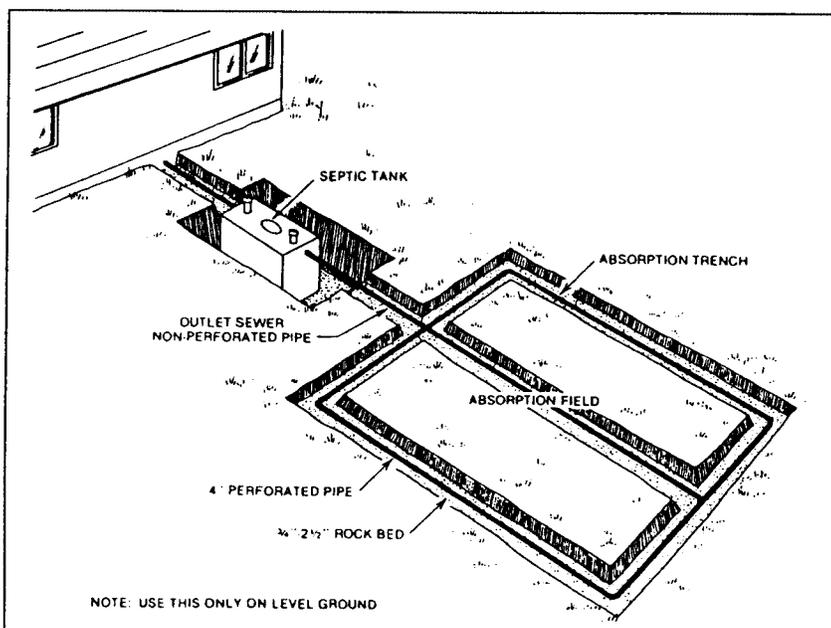
A septic tank that is too small can easily be overloaded and cause septic system failure. South Dakota regulations for on-site wastewater disposal require a minimum of a 1000 gallon tank. A typical 4-bedroom house requires a 1250 gallon septic tank for

proper retention time and 1400 square feet of absorption field in a clay loam soil. If a garbage disposal is used, the septic tank needs to be about 20 percent larger or 1700 gallons.

Older septic systems may be overloaded because of modernization of family living style or change in family size. Dishwashers, automatic washing machines, water softeners, and garbage disposal units require additional water and wastewater treatment. If a septic system is too small, waste moves through the septic tank too fast for sludge to settle and bacteria to break it down. This may cause solids to enter the absorption field and plug up soil pores, thus causing the system to back up.

South Dakota Regulations require a minimum of four feet between a restrictive soil layer and the bottom of the septic absorption field. A restrictive soil layer can be the high water table mark or a layer of soil which limits water absorption. Less than four feet may allow sewage that is not fully treated to reach the groundwater and cause contamination. Septic systems need to be 150 ft from wells and 10 ft from property lines.

**Figure 1. In a properly working septic system, solids are trapped in the septic tank and liquids flow through the absorption field.**



**Reducing Clean Water Infiltration** Clean water which does not require septic treatment can overload your septic tank causing wastewater to flow through the tank before it is treated. Extreme overloading can wash solids into the absorption field and plug the soil pores. Do not rout water from sump pumps through the septic system; pump it outside the house. Divert surface drainage and runoff from roofs away from the soil absorption field area so the soil will not become saturated.

### Proper Septic System Maintenance

Empty septic tanks every 3 to 5 years depending on the size and the amount of wastes entering the system. Pumping is needed if the tank is more than one-third full of sludge or if the scum buildup is more than 12 inches thick. Methane gas, a dangerous explosive, and hydrogen sulfide, a toxic gas that can cause asphyxiation, both may be present in your septic tank. A professional septic tank cleaner has the experience, equipment to pump your tank safely and dispose of the sludge.

**CAUTION: Do not enter a septic tank. Do not lean into or breathe fumes from a septic tank. Do not smoke near an open septic tank.**

A properly designed and maintained septic system will last for about 20 years. If your system was installed more than 20 years ago, consider a system evaluation or upgrade to meet current state regulations. Septic system life can be extended by following simple guidelines:

**Use toilet paper recommended for septic systems.**

**Conserve household water.** This reduces water flow through the treatment system, allows for longer retention time in the tank, and reduces the amount of water to dissipate. Use lowflow water devices. Faucet flow reducers, toilet dams, and low-flow water saver shower heads reduce water entering the septic system.

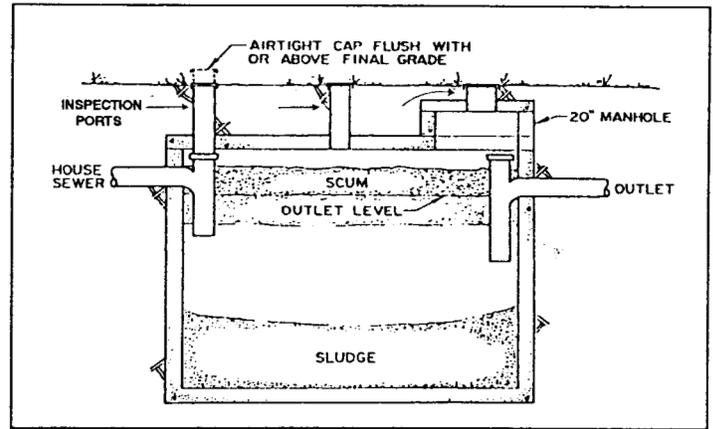
**Use liquid laundry detergents.** Some bulk, packaged powdered detergents contain inert filler material that may plug drain field trenches. Check the ingredient label for these inert fillers.

**Pump the septic tank more often** if a garbage disposal is used.

**Do not use septic tank additives.** None have proven effective and some may cause groundwater pollution.

**Do not dispose of the following items in the septic system:**

- non-biodegradable materials (cloth, hard paper, plastics, sanitary napkins, disposable diapers, coffee grounds, cigarettes)
- petroleum-based products
- latex-based paints



**Figure 2. Septic tank with inspection ports and sealed inlet sanitary tee.**

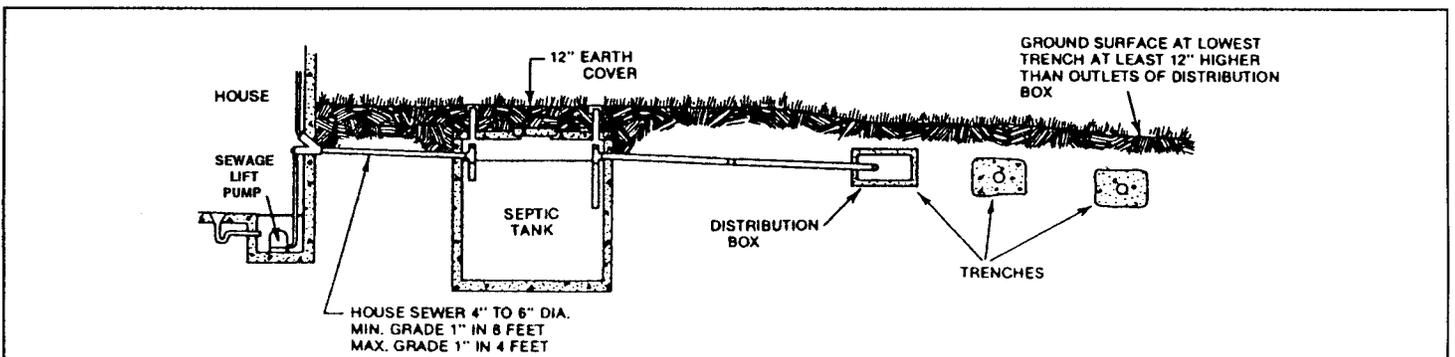
**For More Information**

To learn more about septic systems, contact your local septic tank pumper, certified on-site sewage treatment contractor, or obtain a copy of MWPS-24 "On-site Domestic Sewage Disposal Handbook" available from the Agricultural Engineering Department, South Dakota State University, P.O. Box 2120, Brookings, SD 57006 (cost \$5.00).

**Reference**

South Dakota Codified Law, Chapter 74:03:01 (Individual and Small On-Site Wastewater Systems)

**Figure 3. South Dakota regulations require at least four feet between the high water table mark and the bottom of a septic drain field to allow the soil to treat wastewater before it reaches groundwater.**



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