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Home & Environment

Septic Tanks: The Primary Treatment Device of Your Septic System

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EXPERT REVIEWED

Introduction

Septic tanks play an essential role in effectively treating wastewater in areas without municipal sewage treatment. Homeowners often assume that the septic tank in their backyard *is* their septic system. Actually, the tank is merely the first of a series of components that make up a well-designed septic system.

Purpose of Septic Tanks

A septic tank is a large chamber that collects solids from household sewage while allowing the clarified effluent to move through the tank. The time it takes for the clarified effluent to leave the tank once wastewater has been added from the household is typically 24 to 36 hours. During this short time sewage solids settle or float in the tank, depending on their density. Most of these removed solids break down and are converted to methane, carbon dioxide, and other gases that are released through the household plumbing vent system, usually located in the roof. Typically, 15 to 20 percent of household sewage solids are nondegradable, so the collected solids must be removed from the tank every few years.

To reduce in-tank turbulence and encourage solids to settle, baffles are placed in the tank where the sewage pipe from the house enters the tank and where the discharge pipe takes effluent to the soil absorption field. Older tanks were often fitted with concrete or metal baffles that can corrode over time. A missing or damaged baffle can reduce sewage treatment, or even result in expensive damage to the soil absorption field by allowing solids to overflow the tank. Baffles should be inspected when the tank is cleaned and replaced as needed.

Risers are access ports that extend from the buried tank to the soil surface. Risers aid tank maintenance by providing easy access to the tank for cleaning and baffle inspection. Risers should be installed on all new tanks and can even be retrofitted for existing tanks. All risers should be childproof and watertight, with the soil surface sloping away from the opening to ensure that surface runoff does not enter the tank.

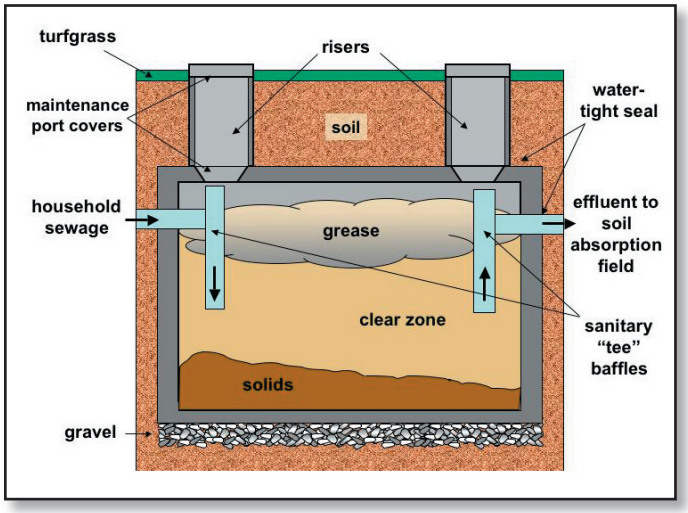

Figure 1. *A cross-section view of a septic tank. Dense organic matter sinks while lighter wastewater components (grease and fats) float. The clarified effluent moves from the septic tank to the soil absorption field.*

Types of Septic Tanks

Septic tanks are constructed of concrete, fiberglass, or plastic but all must be watertight and protected from corrosion. Tanks are normally fabricated off-site. Some are transported to the site in one piece, while others are cast in two pieces and reassembled and sealed at the joint on site. One-piece designs are usually preferred because there is a lower chance of leakage.

Septic tanks can be single chambered or multi-chambered. An advantage of multi-chamber tanks includes

additional effluent stilling, allowing solids to settle more effectively. A disadvantage is that multi-chamber tanks need to be cleaned more often than comparably sized single chamber tanks because most solids will collect in the first compartment.

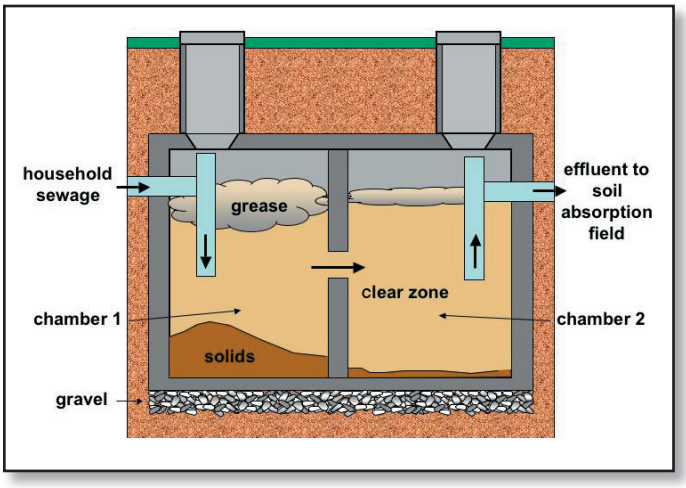

Figure 2. *Dual chamber septic tanks help separate solids from the clarified effluent that will move out to the soil absorption field. These tanks require more frequent maintenance than comparably sized single chamber tanks.*

According to Indiana State Department of Health Rule 410IAC 6-8.1, the size of a household septic tank is determined by the number of a home's bedrooms. The more bedrooms, the larger the tank, as shown in the table below.

Bedrooms in Home	Liquid Capacity of Tank (gallons)
2	750
3	1000
4	1250
5	1500
5+	1500 + (150 x each additional bedroom)

Table 1. *The size of a household septic tank is determined by the number of a home's bedrooms. Indiana State Department of Health Rule 410 IAC 6-8.1 Residential Sewage Disposal Systems*

Maintenance

Effluent filters

Although not required by Indiana law it is highly recommended that effluent filter devices be installed at the outlets of new or retrofitted septic tanks. Effluent filters replace the standard outlet baffles of a septic tank. These devices filter out solids remaining in the tank effluent and help prevent solids from leaving the tank and plugging the soil absorption field. Effluent filters are easily maintained by homeowners or professionals. Solids that collect on the filter's surface can simply be hosed off back into the tank. Filters should be checked every 6 to 12 months and cleaned as needed. If the effluent filter device clogs significantly, the household plumbing drains cannot function properly. When the effluent filter device needs frequent maintenance (like every few weeks or months), this is an indication that the septic tank needs cleaning.

Effluent filters can be installed easily on new or older tanks. If a septic tank does not already have one, a riser should be installed at the same time to make cleaning and maintenance easier. The riser lid must be securely fastened for safety (see "Safety" below).

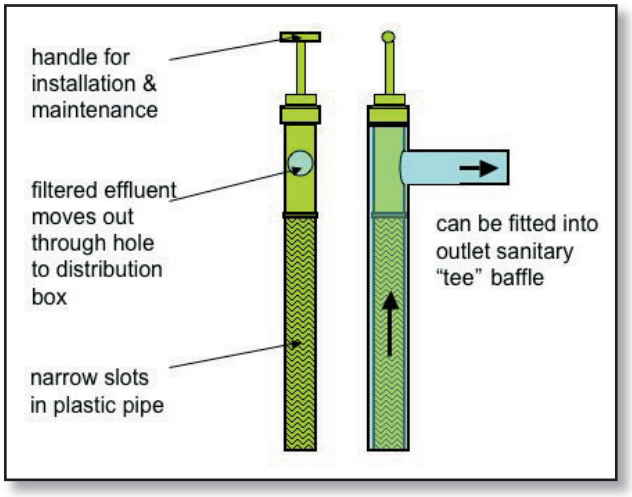

Figure 3. *An effluent filter device is essentially a mesh screen that fits into or replaces the outlet baffle of the septic tank. It prevents solids from moving out of the septic tank and being deposited in the soil absorption field trenches.*

Watertight tanks

Septic tanks must be watertight. Water entering through cracks or leaking risers can cause hydraulic overload of the soil absorption field. Untreated wastewater also could leak out of the tank, contaminating surface or groundwater. The septic tank should be checked for cracks and leaks when it is installed. When cleaning, septic tank cleaners should also make a cursory inspection for obvious leaks or cracks.

Vehicle traffic

Do not park on or drive over your septic system with anything heavier than a riding lawn mower. Septic tanks

and soil absorption systems are installed very close to the ground surface. Traffic from large vehicles can collapse the top of the tank, crush a connecting sewer pipe, or compact the soil, irreversibly decreasing the soil permeability in the absorption field.

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Figure 4. *This photograph shows a concrete septic tank lid that has collapsed under a truck's weight. Repair costs were more than $1,000.*

Safety

Only a trained professional should perform septic tank repairs. Hazards of improperly covered tank openings and careless maintenance include exposure to toxic or explosive fumes, a lack of oxygen, and drowning. Every year, these hazards result in the deaths of children and adults.

Tank Tips to Remember:

- Always leave septic tank repairs to professionals
- Install waterproof and childproof risers on septic tanks if you don't already have them
- Add an effluent filter device to the outlet end of the septic tank
- Have your tank cleaned and inspected by a professional every 3 to 5 years

For more septic system maintenance tips see HENV-2-W, *Increasing the Life of Your Septic System* (http://www.ces.purdue.edu/extmedia/HENV/HENV-2-W.pdf).

For additional septic system information online go to http://www.ces.purdue.edu/onsite.

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