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Home & Environment

Increasing the Longevity of Your Septic System

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EXPERT REVIEWED

Introduction

Upon the purchase of a home, whether new or existing, the homeowner does not expect to pay an additional several thousand dollars within the first years of ownership to provide adequate waste disposal. However, this occurs often in Indiana, due to failed septic systems. Seepage in the backyard, inability to flush the toilet or drain the bathtub, and illnesses due to contaminated drinking water are a few of the problems related to these failures, not to mention the frustration of high repair costs.

This publication – sort of a septic system 101 course – explains how a septic system functions and provides suggestions about how to maintain and increase the life-span of a system.

How a Septic System Works

The traditional septic system (Figure 1) is made up of three main parts: tank, distribution box, and absorption field. The **tank** is where the wastewater is directed once it leaves the home. It's where solids separate from the liquid effluent over about a 24-hour period. The greases and fats are lighter in weight and tend to float to the top, forming a scum layer. The heavier particles settle to the bottom forming a layer of sludge. The area in between is the liquid portion that is discharged to a soil absorption field (Figure 2). A baffle (restriction at the tank outlet) prevents solids from overflowing and plugging the soil. Baffles also dampen the effects of fast moving water entering the tank from the home that could disrupt the wastewater separation process. Newer septic tanks can easily be fitted with an effluent filter, which attaches to the baffle at the outlet end of the tank. Effluent filters are very effective at keeping solids in the tank and allowing only the clear liquid portion of the wastewater to discharge to the soil absorption field.

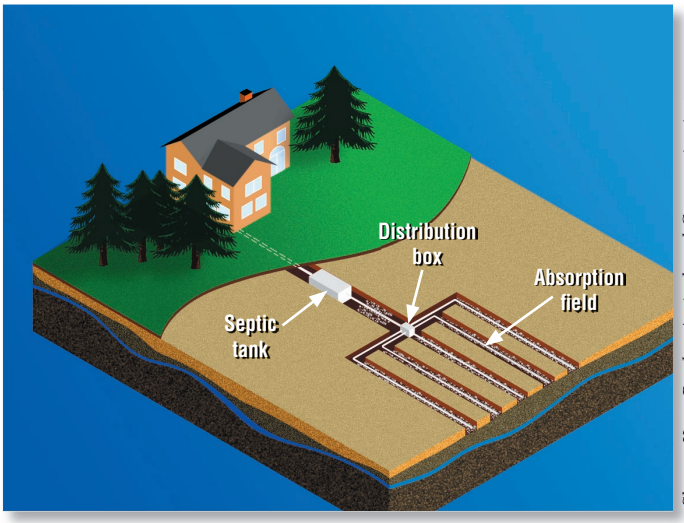

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Figure 1. *Conventional septic system layout.*

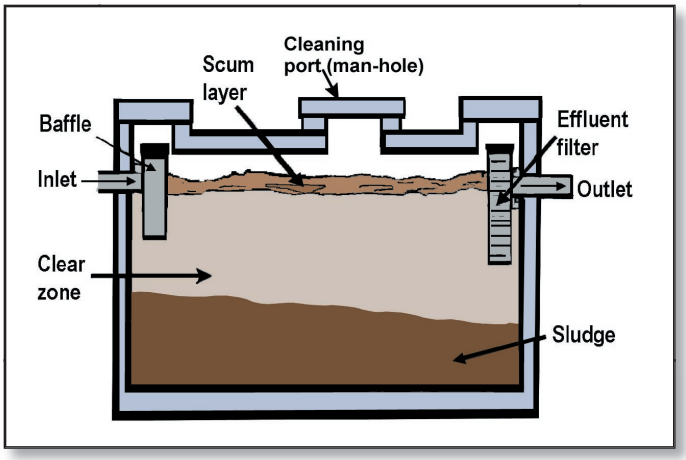

Figure 2. *Distribution of solids within a septic tank.*

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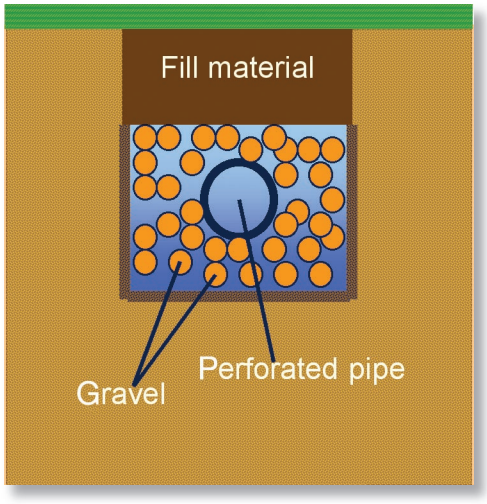

Figure 3. *Cross section of individual soil absorption field trench.*

Effluent filters can and should be retrofitted in existing tanks when possible, since they protect the soil absorption field, the most expensive part of the system.

From the septic tank, wastewater effluent is transferred via a watertight pipe to a distribution box. The distribution box is simply a concrete or plastic box with several outlet ports installed at the same elevation to dispense the effluent equally among the trenches of the absorption field. If the outlets to the trenches are not at the same elevation, one trench will receive more effluent than another, which could overload and damage that portion of the soil absorption field.

The soil absorption field (Figure 1) is where the final treatment processes take place. Effluent flows from the distribution box through several solid pipes to a series of parallel trenches in the soil. Each trench is filled with gravel surrounding a perforated pipe. Effluent moves through the perforated pipe and is introduced into the soil trench after trickling though the gravel (Figure 3). Pathogens are removed from the wastewater in the soil by three general processes:

1. predation by other organisms that feed on the pathogens,
2. adsorption of pathogens to soil particle surfaces, and
3. desiccation of the pathogens in the oxygen-rich soil below the absorption field trenches.

Septic Systems Placement

The absorption field must be placed in a suitable area. The area selected must have limited vehicular and foot traffic before and after construction. Parking, driving, and walking over the absorption field can cause soil compaction and pipes to break or sag. Avoid planting shrubs or trees near or within the absorption field because large roots from shrubs and trees can grow into the absorption field and possibly plug or break the pipes. Due to the health risks associated with food contamination, *never use an absorption field for a vegetable garden*.

Taking Care of Your System

Additives

There are numerous septic system additives available and marketed as a necessity for a properly functioning septic system. However, if properly designed, the system should not need additives.

Cleaning

After several years' of sludge and scum accumulation, the area between the two layers will become limited. In order to maintain an adequate detention time in the septic tank, a professional septic tank cleaner should be hired to remove the scum and sludge.

The length of time between cleaning the tank depends on the amount of solids entering the system and the size of the tank. Three to five years should be adequate for most single-family home septic systems.

Make sure the cleaner thoroughly removes all sludge, effluent, and scum from the tank. If the tank has an effluent filter, it should be removed and cleaned out every 6 to 12 months. Simply hose off the solids back into the tank. If the effluent filter becomes plugged every few months, it is time to call the septic tank cleaner.

Table 1. *Disposal materials not suitable for septic systems.*

Kitchen	Bathroom	Laundry Room	Garage
Oil	Pharmaceuticals	Powdered laundry detergents	Fertilizers
Grease	Feminine products	Household cleaners	Pesticides
Large food particles	Non-biodegradable toilet paper	Bleach	Paints or paint thinner
Coffee	Contraceptives	Arts and crafts Remnants (i.e., glue)	Mechanical oil
Paper towels	Diapers	Cat litter	Gasoline
Cigarete Butts	Dental floss	Lint	Solvents

Be Careful About What Goes Down the Drain

Remember that what is disposed of within your household plumbing system ends up in your septic system and eventually in the environment. Excessive water usage from very large amounts of laundry and inefficient water fixtures can cause hydraulic overload of the absorption field, resulting in surface ponding. Substances such as paint thinner, bleach, and car oil (Table 1) poured into the wastewater stream can disrupt biological activity in the tank, clog up the soil pores in the absorption field, and even contaminate ground water sources in the area.

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Maintenance Tips for a Longer, Healthier Septic System

- Avoid the use of septic system additives.
- Have the tank pump every 3-5 years.
- Minimize excess water use.
- Minimize the use of a garbage disposal; compost or throw food wastes in the garbage.
- Avoid planting trees around the system, especially near the absorption field inlet pipe.
- Avoid flushing any object and substance that does not easily decompose down the drain.
- Avoid vehicular traffic and construction activities in the absorption field area before and after the field is installed.
- Divert run-off water from your lawn, roof, and basement drain away from the absorption field.
- Keep chemicals and petroleum products out of the system.

For additional information, go to Purdue University's Onsite Online website at: http://www.ces.purdue.edu/onsite

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