

SEPTIC SYSTEM CARE

THE ESSENTIALS OF USING AND MAINTAINING SEPTIC TANK SYSTEMS

INTRODUCTION

This publication is designed for homeowners and home buyers or anyone concerned with the proper use and maintenance of residential septic tank sewage disposal systems. It contains basic information on the design and construction of such systems along with more comprehensive information on their proper use and maintenance. Septic tank systems, if suitable for the location and designed, installed, and maintained properly, can give many years of trouble-free service.

SEPTIC SYSTEMS: WHAT THEY ARE AND HOW THEY WORK

A typical septic tank sewage disposal system consists of a watertight septic tank, a distribution box and a subsurface absorption field. Many systems also require a holding tank with a sewage pump to pump the water up to the distribution box or directly into the soil. Septic tanks are usually made of precast concrete but they could be made of fiberglass, steel, poured-in-place concrete, bricks or concrete blocks. Concrete tanks usually last for 50 years or more while steel tanks may last only about 20-30 years. For residential use, septic tanks usually range in size from 750-1500 gallons but the minimum size allowed in most Counties is 1000 gallons. The tank size needed for a particular house depends on the number of people using the system and is determined by the number of bedrooms in the house. However, if a garbage disposal unit is to be installed on the kitchen sink, it is recommended that the size of the septic tank be increased to accommodate the extra amount of water and solid material generated by the disposal.

The purpose of the septic tank (Figure 1) is: (1) to provide an airtight storage container where the household sewage is retained for 2-3 days, so that solid materials can settle to the bottom and (2) to provide for the optimum growth of bacteria which digest and liquefy the settled solids. The bacteria which are common in human waste, reduce most of the solids to liquids, leaving behind an indigestible sludge which slowly builds up in the bottom of the tank and must be removed from time to time. The digestion process produces gas which rises to the top of the tank and carries with it grease and lighter particles of solid matter. These collect at the surface forming a thick layer of scum which provides a breeding place for more bacteria. The partially treated water (effluent) flows from the septic tank to the distribution box or to a holding tank and then to the absorption field where it is purified as it passes through the soil. Some effluent is drawn to the ground surface and evaporates while most of it moves downward and replenishes the ground water.

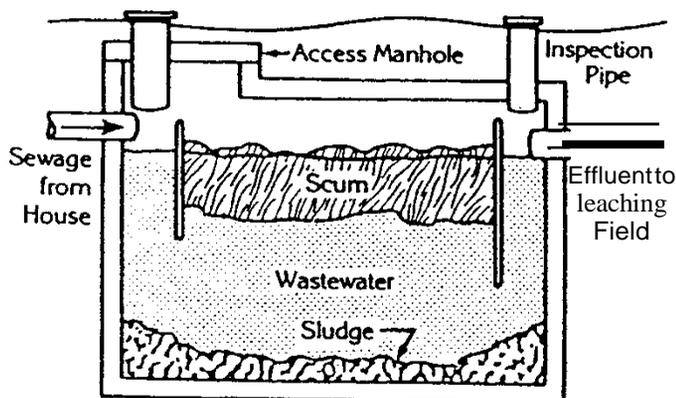


Figure 1: A TYPICAL SEPTIC TANK

The absorption field is usually made of long perforated or open-jointed pipes buried in shallow, gravel-filled trenches called fingers. The absorption field can also be in the form of beds, mounds or leaching pits surrounded by gravel. The total length of fingers needed for a specific house depends on the number of bedrooms in the house and the ability of the soil to absorb water which is called the rate of percolation. Sandy soils absorb water much better than clayey soils and do not clog up as fast because the soil particles and the voids between particles are much larger. The use of a garbage disposal, dishwasher or washing machine requires an expansion of the finger system and is usually figured as the equivalent of an extra bedroom. Factors which affect the life span of absorption fields are the soil conditions, the size of the system, the number of people using the system, the personal habits of the people and the care and maintenance given to the system. A properly designed and maintained system should last about 20 years. However, the high clay content of the soils found in southern Indiana is the main reason for the shorter life spans of many absorption fields in this area.

ESSENTIALS OF PROPER USE

AVOID DISPOSAL OF INERT, TOXIC OR NON-BIODEGRADABLE SUBSTANCES

Inert or non-biodegradable substances such as plastic in disposable diapers, sand or clay from cat box litter, filters from cigarettes, bulky wastes, sanitary napkins, paper towels and tissues should not be disposed of in the septic system. These items quickly fill the septic tank, decrease its efficiency, and if the tank is not pumped in time, could lead to premature clogging of the absorption field. Special care should be taken to avoid putting any liquid fat or grease down the kitchen sink drain. Fats and greases solidify and accumulate and may contribute to blockage within the system. Similarly, the use of garbage disposal units in the kitchen sink should be avoided, as disposers increase the amount of solids in the septic tank, and will necessitate more frequent pumping.

Toxic and hazardous chemicals should not be disposed of in the septic system. These include paints, varnishes, thinners, waste oils, photographic solutions, pesticides, herbicides, fungicides and any other organic chemicals. Moderate use of household cleaners, disinfectants, and bleaches will do little harm to the system. However, non-biodegradable chemicals used to unclog drain pipes should not be used as they interfere with the growth of bacteria needed to digest the solid materials in the septic tank. Also, discharging the backwash water from water softeners into the septic system should be avoided if possible. This is especially important if the system is built on clay soil. The salt brine of the backwash water will clog the voids in finely textured clay soil and significantly shorten the life of the absorption field.

CONSERVE: REDUCE WATER FLOW TO THE SYSTEM

Extra water going into the septic system increases the hydraulic load on the absorption field, reducing its ability to drain away waste waters. This condition occurs naturally during periods of heavy rainfall or melting snows, which cause saturated soil conditions and high water tables. It is important that the area over the absorption field be properly graded to drain surface water away from the field thereby minimizing any ground water problems. Surface water should never be allowed to pond or collect over the absorption field.

One means of reducing water flow to the system is through water conservation. For example, front loading washers use only half as much water as top loading washers. Water saving devices offer an inexpensive and lasting approach to conserving water in the home. These include water saving shower heads rated at 3 gallons per minute or less, water saving toilets which use 1.5 gallons per flush versus the standard 5 gallons per flush, and low-flow faucet aerators for sinks. These devices can be installed without major disruptions in water-use habits. Even bricks, etc. placed in the standard 5 - gallon toilet tank will decrease monthly use of water significantly.

Other hints for conserving water:

- Stop leaks. Leaking faucets or toilet tanks should be promptly repaired or replaced.
- Avoid doing 2 or 3 loads of laundry in one day. Space out the washing over the week and always try to operate the washer with a full load.
- Do not connect the sump pump, foundation drains or roof drains to the septic system.
- Educate family members, especially children about water saving practices.

ESSENTIALS OF PROPER MAINTENANCE

ACCURATELY LOCATE AND DIAGRAM THE SEPTIC TANK AND DISPOSAL FIELD

The first step in properly maintaining a septic system is knowing where it is. The access cover or manhole of the septic tank should be about 6 inches and no deeper than 24 inches below the ground surface, but finding it can be a frustrating, time consuming and sometimes expensive process. Knowing the exact location of the septic tank access cover will greatly facilitate digging up and pumping out the tank. If the access cover is below 24" deep, an access riser or manhole should be installed to bring the cover to within 6" of the ground surface. One good way to locate the cover is to place some kind of permanent marker on the ground above the tank. The location of the distribution box and finger system will be needed if replacement of the system is necessary. Heavy vehicles should be kept away from both the septic tank and the finger system as they can cause damage to the system.

Ideally, the homeowner should have a diagram showing the location of the house, the septic tank access cover, the distribution box and the finger system. If you are about to buy a house with a septic system, you should make a point of getting as much information in writing as possible from the seller. Even a rough sketch is better than nothing when you need to locate the system. Also, try to find out the name of the contractor who built the system and the name of the company who has pumped out the tank as these people can often be helpful in locating the system. Finally, the local Health Department may have records on the system especially if it is less than 10 years old.

INSPECT AND PUMP OUT THE SEPTIC TANK REGULARLY

The septic tank needs to be pumped out when the sludge and solids build up at the bottom of the tank. If the tank is not pumped, solids build up and can be carried into the soil absorption system, where they clog the voids between the soil particles and block the flow of the liquid into the soil. When this happens, the soil absorption system must be replaced which is a costly undertaking. The frequency of cleaning depends on the size of the septic tank, the number of people it serves, the personal habits of the people and whether or not a garbage disposal is used. Experts recommend that septic tanks should be inspected every 2 years to determine rates of scum and sludge accumulation. However, with ordinary use and care, a septic tank usually requires cleaning every 3 to 5 years but in some cases can be satisfactorily operated for a longer period of time.

Failure to pump out the septic tank regularly is the most frequent cause of damage to soil absorption systems. Some people have the attitude that if the septic system is not overflowing, then it doesn't need to be pumped. But, if the septic tank is overflowing, it's already too late to save the finger system. The precaution of pumping and periodic inspection of the tank will maximize the life span of the finger system and prevent the needless expense of replacing the system.

Caution should be exercised during septic tank inspections as toxic gasses are present in the tank. Never go down into a septic tank. It is not necessary to leave solids in the septic tank to "start" the bacterial action again. Even in a tank which has been pumped there are more than enough microorganisms to keep the tank active and flourishing. On the other hand, the septic tank should not be washed, scrubbed, or disinfected. Also, the use of biological additives is not necessary according to the experts. Flushing yeast or store-bought enzymes into the septic system to aid bacteria growth is not necessary since the bacteria occur naturally in human waste and are being continuously replenished. None of these products have been found to be of significant value in improving system performance or in preventing failures.

IF THE SOIL ABSORPTION SYSTEM FAILS

The first sign that the absorption field is failing is when the field overflows during periods of heavy water usage such as during a party or after doing several loads of laundry in succession. At this point, drastic water conservation measures will help to prolong the life of the field but its capacity is severely limited and replacement of the field will be needed in the near future. As the soil of the absorption field becomes more and more clogged over time, the field will overflow more often until water is coming to the surface of the ground continuously. Occasionally, if the soil is hard over the field and the water can't rise to the surface, the septic tank may overflow or the plumbing in the house may back up. Lush green grass growth may indicate the point of failure or a black odorous liquid may be present. This condition should be considered a serious health hazard and children and pets should be kept away from the location. Such overflows not only create offensive odors but are a health hazard because sewage may contain organisms which cause dysentery, infectious hepatitis, typhoid and para-typhoid or other infectious diseases. In addition, ponded sewage creates breeding places for some kinds of mosquitoes and other insects.

When the absorption field or finger system becomes clogged and is no longer adequately absorbing effluent, there is only one practical alternative, install a new system. There are some experimental techniques which have been developed, but there is no quick chemical or biological fix to rejuvenate clogged absorption fields. However, if the field can be shut down and dried out, research has shown that there is a biological breakdown of substances which cause the soil clogging and the field will recover some of its former capacity given sufficient time (at least a year). In cases where there is limited space or difficult soil conditions, the possibility of reusing the old absorption field after several years of rest should be considered instead of just abandoning it.

Another alternative in cases of limited space or difficult soil conditions is a mound system. This is a carefully built-up bed of sand and gravel over the existing soil on which the absorption field is installed. Sewage is pumped to the mound at a fixed rate from a holding tank. Such systems are effective but they are more expensive and must be specially designed.

The construction of new septic systems or the alteration of an existing system requires a permit from the local health department. In many cases, they will have records of existing systems and they should be able to provide copies of local and state regulations governing the construction of septic systems.

CONCLUSION

In conclusion, modern septic tank systems are a necessary and effective alternative means of sewage disposal for millions of American homeowners who do not have access to municipal sewer systems. With proper care and maintenance, many years of economical and trouble free service can be expected from a septic system. We hope this information will be helpful in achieving that goal.

DISCLAIMERS

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