

# MAINTAINING YOUR SEPTIC SYSTEM

## A GUIDE FOR HOMEOWNERS

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### INTRODUCTION

Out of sight and out of mind. If you are like most homeowners, you probably never give much thought to what happens to what goes down your drain, If you have a septic system, what you don't know can hurt you. Following recommendations from the Indian Health Service for the proper operation and maintenance of your septic system can have a huge impact on its proper operation, and how long it will last.

#### **Why Maintain Your System?**

There are several primary reasons why septic system maintenance is so important. One reason is money. Failing septic systems are expensive to repair or replace. The minimal amount of preventative maintenance that septic systems require is very little. For example, it typically costs from \$3,000.00 to \$10,000.00 to replace a failing septic system with a new one compared to \$50 to \$150 to have a septic system inspected and \$150 to \$250 to have it pumped.

Another reason to maintain your system is to protect the health of your family, your community, and the environment. When septic systems fail, inadequately treated wastewater is released into the environment. Untreated wastewater from failing septic systems can contaminate nearby wells, groundwater, drinking water sources, and transmit diseases.

Chemicals improperly released through a septic system can pollute local water sources and contribute to system failures. For this reason it is important for homeowners to educate themselves about what should and should not be disposed of through a septic system.

Finally, the third reason to maintain your septic system is to protect the economic health of your community. Failed septic systems can cause property values to decline. Sometimes building permits cannot be issued or real estate sales can be delayed for

these properties until systems are repaired or replaced. Also, failed septic systems can contribute to the pollution of local rivers, lakes, and shorelines that your community uses for commercial or recreational activities.

## **Why Many Systems Fail**

Inadequate site assessment, construction, or design often contribute to septic system failures. However, if your septic system has been properly designed, constructed, and installed, then you are the most likely remaining threat to the health and longevity of your septic system. Fortunately, it is easy to learn how to properly operate and maintain a septic system.

This guide focuses on educating homeowners about proper septic system operation and maintenance. Some of the topics include groundwater pollution, system inspections, and the use of additives and cleaners. This guide also includes a handy reference list of important septic system do's and don't's for homeowners.

## **IS YOUR SEPTIC SYSTEM FAILING?**

Septic system owners should be alert to the following warning signs of a failing system:

- Slowly draining sinks and toilets
- Gurgling sounds in the plumbing
- Plumbing backups
- Sewage odors in the house or yard
- Ground wet or mushy underfoot
- Grass growing faster and greener in one particular area of the yard
- Tests showing the presence of bacteria in well water

None of these warning signs can be considered a sure indication that a system has failed, but the appearance of one or more of them should prompt homeowners to have their systems inspected. Septic system failures also can occur without any of these warning signals. For this reason, yearly inspection of your septic system is recommended and even required by some communities. Information about septic tank inspection is provided later in this guide.

## **GROUNDWATER POLLUTION**

Preventing groundwater pollution from failing septic systems should be a priority for every community. Contamination of the groundwater source can lead to the pollution of local wells, streams, lakes, and ponds, exposing family, friends, and neighbors to waterborne diseases and other serious health risks.

When a septic system fails, inadequately treated domestic waste can reach the groundwater. Bacteria and viruses from human waste can cause dysentery, hepatitis, and typhoid fever. Many serious outbreaks of these diseases have been caused by contaminated drinking water.

Nitrate and phosphate, also found in domestic wastewater, can cause excessive algae

growth in lakes and streams called algae blooms. These blooms cause aesthetic problems and impair other aquatic life. Nitrate is also the cause of methemoglobinemia, or blue baby syndrome, a condition that prevents the normal uptake of oxygen in the blood of young babies. In addition, hazardous household chemicals like paints, varnishes, waste oils, and pesticides pollute the groundwater and should never be disposed of through a septic system. They can also kill the microorganisms in the system that break down the waste. *See the list of DO's and DON'Ts for septic system owners later in this guide for more about what should and should not be disposed of in a septic tank system.*

## **HOW TO MAINTAIN YOUR SEPTIC SYSTEM**

Septic systems are a very simple way to treat household wastewater and are easy to operate and maintain. Although homeowners must take a more active role in maintaining septic systems, once they learn how their systems work, it is easy for them to appreciate the importance of a few sound operation and maintenance practices.

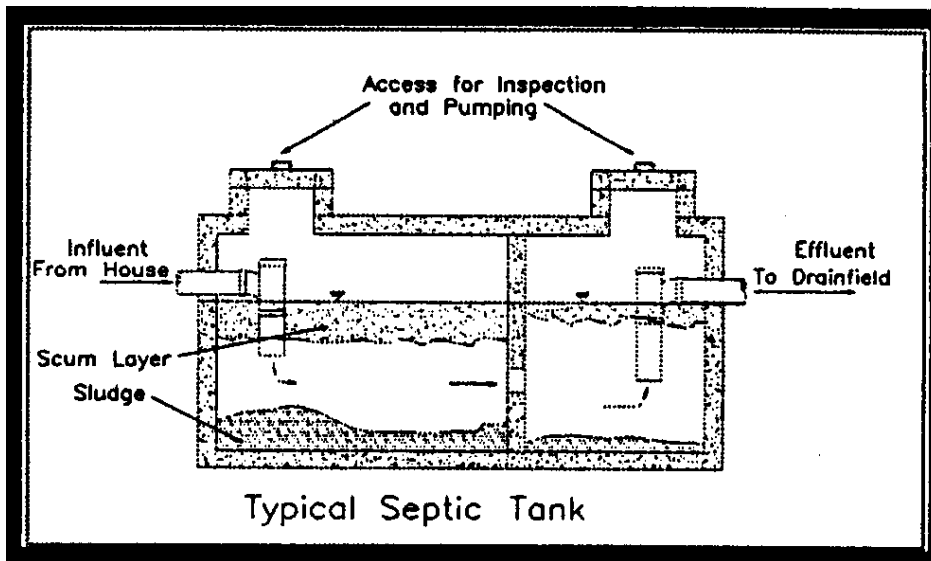
### **What makes up a Septic System?**

There are two main parts to the basic septic system: the septic tank and the drainfield.

#### **The Septic Tank**

Household wastewater first flows into the septic tank where it should stay for at least a day. In the tank, heavy solids in the wastewater settle to the bottom forming a layer of sludge, and grease and light solids float to the top forming a layer of scum (refer to the graphic on next page).

The sludge and scum remain in the tank where naturally occurring bacteria cannot completely break down all of the sludge and scum, however, and this is why septic tanks need to be pumped periodically. The separated wastewater in the middle layer of the tank is pushed out into the drainfield as more wastewater enters the septic tank from the house. If too much water is flushed into the septic tank in a short period of time, the wastewater flows out of the tank before it has time to separate.



This can happen on days when water use is unusually high (laundry day, for example), or more often if the septic tank is too small for the needs of the household. Some septic tanks are outfitted with a baffle screen. This screen serves to protect the drain field from receiving solids.

## The Drainfield

When wastewater leaves a septic tank too soon, solids can be carried with it to the drainfield. Drainfields provide additional treatment for the wastewater by allowing it to trickle from a series of perforated pipes, through a layer of gravel, and down through the soil. The soil acts as a natural filter and contains organisms that help treat the waste. Solids damage the drainfield by clogging the small holes in the drainfield pipes and help to create a clogging mat in the surrounding gravel, and excess water strains the system unnecessarily.

## How to Care For Your Septic System

Septic system maintenance is often compared to automobile maintenance because only a little effort on a regular basis can save a lot of money and significantly prolong the life of the system.

Sound septic system operation and maintenance practices include conserving water, being careful that nothing harmful is disposed of through the system, and having the system inspected annually and pumped regularly.

By educating everyone in your household about what is and what isn't good for septic systems, they can begin to develop good maintenance habits.

## Use Water Wisely

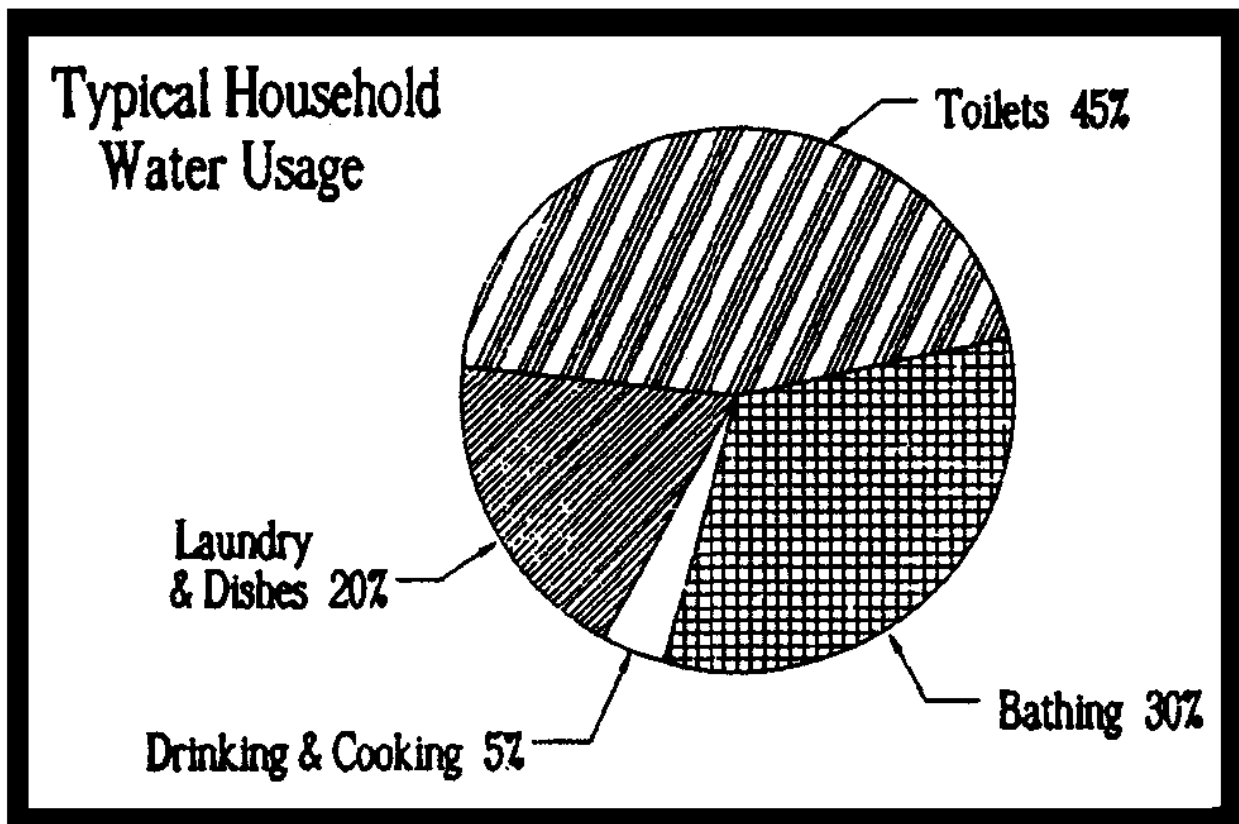
Water conservation is very important for septic systems because continual saturation of

the soil in the drainfield can affect the quality of the soil and its ability to naturally remove toxins, bacteria, viruses, and other pollutants from the wastewater.

The most effective way to conserve water around the house is to first take stock of how it is being wasted. Immediately repair any leaking faucets or running toilets, and use washing machines and dishwashers only when full.

In a typical household, most of the water used indoors is used in the bathroom, and there are a lot of little things that can be done to conserve water there.

For example, try to avoid letting water run while washing hands and brushing teeth. Avoid taking long showers and install water-saving features in faucets and shower heads. These devices can reduce water use by up to 50 percent. Low-flush toilets use one to two gallons per flush compared to the three to five gallons used by conventional toilets.



Even using a toilet dam or putting a container filled with rocks in the toilet tank can reduce water use by 25 percent.

It is also important to avoid overtaxing your system by using a lot of water in a short time period, or by allowing too much outside water to reach the drainfield. Try to space

out activities requiring heavy water use (like laundry) over several days. Also, divert roof drains, surface water, and sump pumps away from the drainfield.

## **Know What Not To Flush**

What you put into your septic system greatly affects its ability to do its job. As a general rule of thumb, do not dispose of anything in your septic system that can just as easily be put in the trash. Remember that your system is not designed to be a garbage disposal, and that solids build up in the septic tank and eventually need to be pumped out.

In the kitchen, avoid washing food scraps, coffee grounds, and other food items down the drain. Grease and cooking oils contribute to the layer of scum in the tank and also should not be put down the drain. Garbage disposal can increase the amount of solids in the tank up to 50 percent and are not recommended for use with septic systems.

The same common-sense approach used in the kitchen should be used in the bathroom. Don't use the toilet to dispose of plastics, paper towels, tampons, disposable diapers, condoms, kitty litter, etc. The only things that should be flushed down the toilet are wastewater and toilet paper. (For a list of items, see "Do Not Flush" later in this guide).

## **Avoid Hazardous Chemicals**

To avoid disrupting or permanently damaging your septic system, do not use it to dispose of hazardous household chemicals. Even small amounts of paints, varnishes, thinners, waste oil, photographic solutions, pesticides, and other organic chemicals can destroy helpful bacteria and the biological digestion taking place within your system. These chemicals also pollute the groundwater.

Some septic system additives that claim to help or clean your system also contain hazardous chemicals and should be avoided. (See the Q&A on septic system additives following this section).

Household cleaners, such as bleach, disinfectants, and drain and toilet bowl cleaners should be used in moderation and only in accordance with product labels. Overuse of these products can harm your system. It makes sense to try to keep all toxic and hazardous chemicals out of your septic tank system when possible.

To help prevent groundwater pollution, be sure to dispose of leftover hazardous chemicals by taking them to an approved hazardous waste collection center. For locations and more information, contact your local health department.

## **Pump Your Tank Regularly**

Pumping your septic tank is probably the single most important thing you can do to protect your system. If the buildup of solids in the tank becomes too high and solids move to the drainfield, this could clog and strain the system to the point where a new drainfield will be needed.

## **Inspect Your System Annually**

Inspecting your septic system annually is a good way to monitor your system's health. Inspections can reveal problems before they become serious, and by checking the levels of sludge and scum in your tank, you can get a more accurate idea of how often it should be pumped. For a more detailed discussion of septic system inspections and recommended pumping frequencies and procedures, read the section "Pumping and Inspecting Your System, What To Expect" later in this guide.

## **Protect Your System**

Finally, it is important to protect your septic system from potential damage. Don't plant anything but grass near your septic system, roots from shrubs and trees can cause damage, and don't allow anyone to drive or operate heavy machinery over any part of the system. Also, don't build anything over the drainfield. Grass is the most appropriate cover for the drainfield.

## **QUESTIONS AND ANSWERS**

**Q.** Do I need to add anything to my septic system to keep it working properly?

**A.** While many products on the market claim to help septic systems work better, the truth is there is no magic potion to cure an ailing system. In fact, most engineers and sanitation professionals believe that commercial septic system additives are, at best, useless, and at worst, potentially harmful to a system.

There are two types of septic system additives: biological (like bacteria, enzymes, and yeast) and chemical. Most biological additives are harmless, but some chemical additives can potentially harm the soil in the drainfield and contaminate the groundwater.

While there hasn't been extensive study on the effectiveness of these products, the general consensus among septic system experts is that septic system additives are unnecessary.

**Q.** What type of toilet paper is best for septic tanks?

**A.** Contrary to popular belief, it is not necessary to sacrifice personal comfort to protect

your septic tank. There are many types of toilet paper on the market that are perfectly safe for septic system.

According to the National Sanitation Foundation (NSF), a nonprofit organization that tests products relating to health and the environment, the thickness and color of toilet tissue does not necessarily affect its biodegradability.

NSF subjects the toilet papers it certifies to rigorous testing, and the brands that pass carry the NSF mark stating that they are safe for use with septic systems. However, there probably are many brands without the NSF mark that are also safe.

## Septic System Do's and Don'ts

### DO'S

- **DO** learn the location of your septic tank and drainfield, Keep a sketch of it handy with your maintenance record for service visits.
- **DO** have your septic system inspected annually.
- **DO** have your septic tank pumped out regularly by a licensed contractor (*See the table included in this guide for estimated pumping frequencies*).
- **DO** keep your septic tank cover accessible for inspection and pumping. Install risers if necessary.
- **DO** call a professional whenever you experience problems with your system, or if there are any signs of system failure.
- **DO** keep a detailed record of repair, pumping, inspection, permits issued, and other maintenance activities.
- **DO** conserve water to avoid overloading the system. Be sure to repair any leaky faucets or toilets.
- **DO** divert other sources of water such as roof drains, house perimeter drains, and sump pump discharges from going into or around the septic system. Excessive water keeps the soil in the drainfield from naturally cleansing the wastewater.

**WARNING:** Be sure to exercise appropriate caution when inspecting a septic tank. Never allow anyone to inspect a septic tank alone or go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes, even just looking into the tank can be dangerous.



## DONT'S

- **DON'T** go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes. Extreme care should be taken when inspecting a septic tank, even when just looking in.
- **DON'T** allow anyone to drive or park over any part of the system.
- **DON'T** plant anything over or near the drainfield except grass. Roots from nearby trees or shrubs may clog and damage the drain lines.
- **DON'T** dig in your drainfield or build anything over it, and don't cover the drainfield with a hard surface such as concrete or asphalt. The area over the drainfield should have only a grass cover. The grass will not only prevent erosion, but will help remove excess water.
- **DON'T** make or allow repairs to your septic system without obtaining any required health department permit. Use professional licensed septic contractors when needed.
- **DON'T** use septic tank additives. These products usually do not help and some may even be harmful to your system.
- **DON'T** use your toilet as a trash can or poison your septic system and the groundwater by pouring harmful chemicals and cleansers down the drain. Harsh chemicals can kill the beneficial bacteria that treat your wastewater.
- **DON'T** use a garbage disposal without checking with your local regulatory agency to make sure that your septic system can accommodate this additional waste.
- **DON'T** allow backwash from home water softeners to enter the septic system.

## DO NOT FLUSH

- |                       |                          |
|-----------------------|--------------------------|
| • coffee grounds      | • pesticides             |
| • disposable diapers  | • dental floss           |
| • varnishes           | • paints                 |
| • sanitary napkins    | • waste oils             |
| • cigarette butts     | • thinners               |
| • condoms             | • tampons                |
| • fat, grease, or oil | • photographic solutions |
| • paper towels        | • kitty litter           |

## **How Do cleaners and detergents affect my system?**

When used as recommended by the manufacturer, most household cleaning products will not adversely affect the operation of your septic tank. Drain cleaners are an exception, however, and only a small amount of these products can kill the bacteria and temporarily disrupt the operation of the tank

If you are concerned about the effect of cleaning products on your septic system and the environment, there are some safe alternatives. Penn State University has developed a fact sheet listing alternative cleansers and their uses. The fact sheet is included with a septic system information packet for homeowners. The packet can be obtained by calling the number at the end of this guide.

## **PUMPING AND INSPECTING YOUR SYSTEM WHAT TO EXPECT**

Annual inspections of your septic system are recommended to ensure that it is working properly and to determine when the septic tank should be pumped. By inspecting and pumping your system regularly, you can prevent the high cost of septic system failure.

### **Inspecting Your System:**

Although a relatively simple inspection can determine whether or not your septic tank needs to be pumped, you should consider calling your local health department or hiring a professional contractor. A professional can do a thorough inspection of the entire system and check for cracked pipes and the condition of the tees or baffles and other parts of the system.

A thorough septic system inspection will include the following steps:

1. **Locating the system:** Even a professional may have trouble locating your system if the access to your tank is buried. One way to start looking is to go in your basement and determine the direction the sewer pipe goes out through the wall. Then start probing the soil with a thin metal rod 10 to 15 feet from the foundation. Once your system is found, be sure to keep a map of it on hand to save time on future service visits.
2. **Uncovering the manhole and inspection ports:** This may entail some digging in your yard. If they are buried, try to make access to the ports easier for future inspections. Install risers (elevated access covers) if necessary.
3. **Flushing the toilets:** This is done to determine if the plumbing going to the system is working correctly.
4. **Measuring the scum and sludge layers:** There are two frequently used methods for measuring the sludge and scum layers inside your tank. The contractor may

use a hollow clear plastic tube that is pushed through the different layers to the bottom of the tank. When brought back up, the tube retains a sample showing a cross section of the inside of the tank.

The layers can also be measured using a long stick. To measure the scum layer using a stick, a three-inch piece of wood is attached across the end of the stick to form a "foot," and the stick is pushed down through the scum to the liquid layer. When the stick is moved up, the foot meets resistance on the bottom of the scum layer, and the contractor marks the stick at the top of the layer to measure the total thickness. As a general guideline, if the scum layer is within three inches of the bottom of the inlet baffle, the tank should be pumped.

The sludge layer is measured by wrapping cloth around the bottom of the slick and lowering it to the bottom of the tank. This should be done either through a hole in the scum layer or through the baffle or tee, if possible, to avoid getting scum on the cloth. The sludge depth can be estimated by the length of sludge sticking to the cloth. If the sludge depth is equal to one third or more of the liquid depth, the tank should be pumped.

5. Check the tank and the drainfield: The contractor will check the condition of the baffles or tees, the walls of the tank for cracks, and the drainfield for any signs of failure. If your system includes a distribution box, or pump, the contractor will check these too.
6. Clean your effluent filter - If your septic tank has a filter, it should be pulled out and cleaned of any debris that may be deposited on the screen. Most screens are designed to be pulled from the inspection port above the baffle on the drainfield side of the septic tank. The filter can be hosed off.

## **When To Pump**

How often your tank needs to be pumped depends on the tank size, the number of people living in your home, and the habits of your particular household. Garbage disposal and high-water-use technologies, such as a hot tub or whirlpool, also affect the pumping frequency.

To estimate how often you should have your tank pumped, refer to the table below. This information combined with observations from annual inspections will help you to estimate your individual pumping schedule.

When it is time to pump out your tank, be sure to hire a licensed contractor who has the appropriate equipment and can dispose of the sludge at an approved treatment site. You can find listings for licensed pumpers and haulers in the yellow pages, or contact your local health department for assistance.

Tank Size (Gallons)	Household Size (number of people)					
	1	2	3	4	5	6
	<b>Estimated septic tank pumping frequencies In years</b>					
500	5.8	2.6	1.5	1.0	0.7	0.4
750	9.1	4.2	2.6	1.8	1.3	1.0
900	11.0	5.2	3.3	2.3	1.7	1.3
1000	12.4	5.9	3.7	2.6	2.0	1.5
1250	15.6	7.5	4.8	3.4	2.6	2.0
1500	18.9	9.1	5.9	4.2	3.3	2.6
1750	22.1	10.7	6.9	5.0	3.9	3.1
2000	25.4	12.4	8.0	5.9	4.5	3.7
2250	28.6	14.0	9.1	6.7	5.2	4.2
2500	31.9	15.6	10.2	7.5	5.9	4.8
<b>Estimated septic tank pumping frequencies In years. These figures assume there is no garbage disposal unit In use. (Source: Pennsylvania State University Cooperative Extension Service).</b>						

It's a good idea to be present when your tank is being pumped. Make sure the contractor uses the manhole, not the inspection ports, to pump the tank to avoid damaging the baffles or tees. Also make sure all of the material in the tank is removed, It is not necessary to leave anything in the tank to "restart the biological process, but it is also not necessary to scrub or disinfect the tank.

## **MORE INFORMATION**

*For more information about maintenance districts and other strategies for controlling septic system failures in your community, contact the National Small Flows Clearinghouse's (NSFC) technical assistance department at (800) 624-8301. The Indian Health Service acknowledges and appreciates the efforts of the NSFC in development of this guide. This guide was prepared by the Indian Health Service based on an NSFC publication (Pipeline, Fall 1995, Vol. 6, No.4).*

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*Again, if you have any questions or require further information about any of the topics in this guide, please contact the Indian Health Service or the National Small Flows Clearinghouse at (800) 624-8301.*