

# Guide to Septic System Operation

## “ONSITE WASTEWATER RECYLING SYSTEM”

If properly designed, constructed and maintained, your septic system can provide long-term, effective treatment of household wastewater. If your septic system isn't maintained, you might need to replace it, costing you thousands of dollars. A malfunctioning system can contaminate groundwater which might be a source of drinking water. And if you sell your home, your septic system must be in good working order.

The information provided here will help you care for your septic system. This guide will help you understand how your system works and what steps you can take as a homeowner to ensure your system will continue to work properly. To help you learn more, consult the resources listed at the back of this section. A helpful checklist is also included at the end of this section to help you keep track of your septic system maintenance.

### ***HOW THE SEPTIC SYSTEM WORKS***

#### **Components**

A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it eventually reaches groundwater.

#### **Pipe From the Home**

All of your household wastewater exits your home through a pipe to the septic tank.

#### **Septic Tank**

The septic tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow solids to settle out (forming sludge) and oil and grease to float to the surface (as scum). It also allows partial decomposition of the solid materials. Compartments and a T-shaped outlet in the septic tank prevent the sludge and scum from leaving the tank and traveling into the drainfield area. Screen filters are also recommended to keep solids from entering the drainfield.

Newer tanks generally have risers with lids at the ground surface to allow easy location, inspection, and pumping of the tank.

#### **Locating Your System**

Your septic tank and drainfield should be clearly designated on the “as-built” drawing for your home. (An “as-built” drawing is a line drawing that accurately portrays the buildings on your property and is usually filed in your local land records.) You might also see lids or manhole covers for your septic tank. Older tanks are often hard to find because there are no visible parts. An inspector/pumper can help you locate your septic system if your septic tank has no risers.

#### **Drainfield**

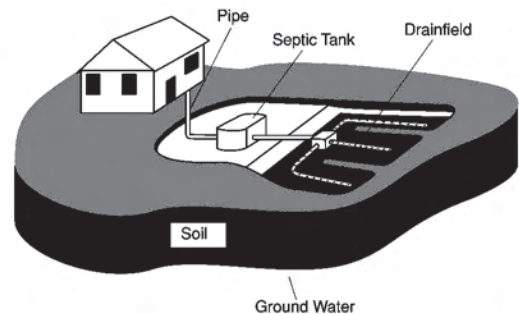
The wastewater exits the septic tank and is discharged into the drainfield for further treatment. The partially treated wastewater flows along into the drainfield. This is the final treatment stage where effluent is purified as it percolates down through the soil.

#### **Soil**

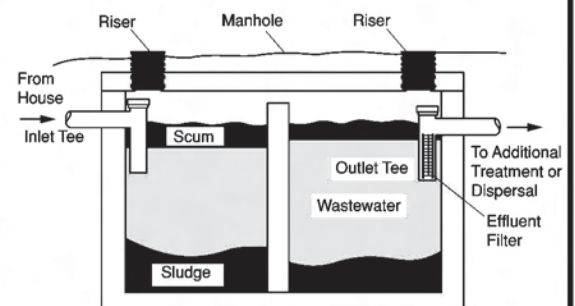
For proper effluent purification, adequate distance to groundwater must be maintained. The distance between the trench bottom and the water table should be equal to or greater than the minimum distance allowed by your local health department. The soil acts as a biological filter, removing harmful bacteria, viruses and nutrients before the effluent reaches the groundwater. Suitable soil is necessary for successful wastewater treatment.

### **Four Things You Can Do to Protect your Septic System**

1. Inspect your system every year and pump your tank as necessary.
2. Use water efficiently.
3. Don't dispose of household hazardous wastes in sinks or toilets.
4. Protect your drainfield. Don't drive or compact the soil.



Typical onsite wastewater treatment system



Typical two-compartment septic tank with ground-level inspection risers and sealant

#### **TIP**

*To prevent buildup, sludge and floating scum need to be removed through periodic pumping of the septic tank. Regular inspections and pumping as necessary are the best and cheapest way to keep your septic system in good working order.*

## Alternative Systems

Because many areas don't have soils suitable for typical septic systems, you might have or need an alternative system. You might also have or need an alternative system if there are too many typical septic systems in one area or the systems are too close to groundwater or surface waters. Alternative septic systems use new technology to improve treatment processes and might need special care and maintenance. Some alternative systems use sand, peat, or plastic media instead of soil to promote wastewater treatment. Other systems might use wetlands, lagoons, aerators, or disinfection devices. Float switches, pumps, and other electrical or mechanical components are often used in alternative systems. Alternative systems should be inspected semi-annually. Check with your local health department or installer for more information on operation and maintenance needs if you have or need an alternative system.

## ***WHY SHOULD I MAINTAIN MY SEPTIC SYSTEM?***

When septic systems are properly designed, constructed, and maintained, they effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater. However, they require regular maintenance or they can fail. Septic systems need to be monitored to ensure that they work properly throughout their service lives.

### **Saving Money**

A key reason to maintain your septic system is to save money! Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. Annual inspections are a bargain when you consider the cost of replacing the entire system. Your system will need pumping (generally every 3 to 5 years), depending on how many people live in the house and the size of the system. An unusable septic system or one in disrepair will lower your property value and could pose a legal liability.

### **Protecting Health and the Environment**

Other good reasons for safe treatment of sewage include preventing the spread of infection and disease and protecting water resources. Typical pollutants in household wastewater are nitrogen, phosphorus, and disease causing bacteria and viruses. If a septic system is working properly, it will effectively remove most of these pollutants.

### **Inspection and Pumping**

Four major factors influence the frequency of pumping: the number of people in your household, the amount of wastewater generated (based on the number of people in the household and the amount of water used), the volume of solids in the wastewater (for example, using a garbage disposal increases the amount of solids), and septic tank size.

### **Watch your Drains**

What goes down the drain can have a major impact on how well your septic system works.

#### ***Waste Disposal***

What shouldn't you flush down your toilet? Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system or might contaminate surface waters and groundwater. If your septic tank pumper is concerned about quickly accumulating scum layers, reduce the flow of floatable materials like fats, oils, and grease into your tank or be prepared to pay for more frequent inspections and pumping.

## **What Does an Inspection Include?**

- Locating the system.
- Uncovering access holes.
- Checking for sign of backup.
- Measuring scum and sludge layers.
- Identifying any leaks.
- Inspecting mechanical components.
- Pumping the tank if necessary.

## **Use Water Efficiently!**

- Install high-efficiency showerheads.
- Turn off faucets while shaving or brushing your teeth.
- Run the dishwasher and clothes dryer only when they are full.
- Use toilets to flush sanitary waste only (not kitty litter, diapers or other trash).
- Maintain your plumbing to eliminate leaks.
- Install aerators in the faucets in your kitchen and bathroom.
- Replace old dishwashers, toilets and clothes washers with new, high-efficiency models.

## Care for Your Drainfield

Your drainfield is an important part of your septic system. Here are a few things you should do to maintain it:

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back up.

## WHAT CAN MAKE MY SYSTEM FAIL?

If the amount of wastewater entering the system is more than the system can handle, the wastewater backs up into the house or yard and creates a health hazard.

You can suspect a system failure not only when a foul odor is emitted but also when partially treated wastewater flows up to the ground surface. By the time you can smell or see a problem, however, the damage might already be done.

A system installed in unsuitable soils can also fail. Other failure risks include tanks that are inaccessible for maintenance, drainfields that are paved or parked on, and tree roots or defective components that interfere with the treatment process.

## Failure Symptoms

The most obvious septic system failures are easy to spot. Check for pooling water or muddy soil around your septic system or in your basement. Notice whether your toilet or sink backs up when you flush or do laundry. You might also notice strips of bright green grass over the drainfield. Septic systems also fail when partially-treated wastewater comes into contact with groundwater. This type of failure is not easy to detect, but it can result in the pollution of wells, nearby streams, or other bodies of water. Check with a septic system professional and the local health department if you suspect such a failure.

## Failure Causes

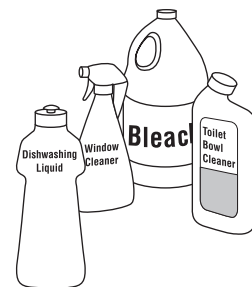
### *Household Toxics*

Does someone in your house use the utility sink to clean out paint rollers or flush toxic cleaners? Oil-based paints, solvents, and large volumes of toxic cleaners should not enter your septic system. Even latex paint clean-up waste should be minimized. Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Leftover paints and wood stains should be taken to your local household hazardous waste collection center. Remember that your septic system contains a living collection of organisms that digest and treat waste.

### *Household Cleaners*

For the most part, your septic system's bacteria should recover quickly after small amounts of household cleaning products have entered the system. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products. The word "Danger" or "Poison" on a label indicates that the product is highly hazardous. "Warning" tells you the product is moderately hazardous. "Caution" means the product is slightly hazardous. "Nontoxic" and "Septic Safe" are terms created by advertisers to sell products. Regardless of the type of product, use it only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.

**– STOP –  
LOOK  
– SMELL –**



### **Hot Tubs**

Hot tubs are a great way to relax. Unfortunately, your septic system was not designed to handle large quantities of water from your hot tub. Emptying hot tub water into your septic system stirs the solids in the tank and pushes them out into the drainfield, causing it to clog and fail. Draining your hot tub into a septic system or over the drainfield can overload the system. Instead, drain cooled hot tub water onto turf or landscaped areas well away from the septic tank and drainfield, and in accordance with local regulations.

### **Water Purification Systems**

Some freshwater purification systems, including water softeners, unnecessarily pump water into the septic system. This can contribute hundreds of gallons of water to the septic tank, causing agitation of solids and excess flow to the drainfield. Check with your licensed plumbing professional about alternative routing for such freshwater treatment systems.

### **Garbage Disposals**

The conservative use of a garbage disposal can reduce the amount of grease and solids entering the septic tank and possibly clogging the drainfield. A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the mixture to the septic tank. Once in the septic tank, some of the materials are broken down by bacterial action, but most of the grindings have to be pumped out of the tank. Using a garbage disposal frequently can significantly increase the accumulation of sludge and scum in your septic tank, resulting in the need for more frequent pumping.

### **Improper Design or Installation**

Some soils provide excellent wastewater treatment; others don't. For this reason, the design of the drainfield of a septic system is based on the results of soil analysis. Homeowners and system designers sometimes underestimate the significance of good soils and believe soils can handle any volume of wastewater applied to them. Many failures can be attributed to having an undersized drainfield or high seasonal groundwater table. Undersized septic tanks (another design failure) allow solids to clog the drainfield and result in system failure.

If a septic tank isn't watertight, water can leak into and out of the system. Usually, water from the environment leaking into the system causes hydraulic overloading, taxing the system beyond its capabilities and causing inadequate treatment and allowing sewage to flow up to the ground surface. Water leaking out of the septic tank is a significant health hazard because the leaking wastewater has not yet been treated.

Even when systems are properly designed, failures due to poor installation practices can occur. If the drainfield is not properly leveled, wastewater can overload the system. Heavy equipment can damage the drainfield during installation which can lead to soil compaction and reduce the wastewater infiltration rate. And if surface drainage isn't diverted away from the field, it can flow into and saturate the drainfield.



**Not in My  
Septic System!**

### **CLOGGERS**

Diapers, Cat Litter, Cigarette Filters,  
Coffee Grounds, Grease, Feminine  
Hygiene Products, etc.

### **KILLERS**

Household Chemicals, Gasoline,  
Oil, Pesticides, Antifreeze, Paint,  
Pharmaceuticals, etc.