

Water Conservation

Since your septic system's effectiveness in treating household waste depends on how you use and operate the system, your water conservation practices can play a big part in proper wastewater treatment. Water use in the home and what you pour down the drain affect how well your system works.

The ideal situation is to have wastewater entering your system as evenly as possible throughout the day. When large volumes of wastewater enter your system within a short period, it can mix up and re-suspend the solids and scum in the tank. These re-suspended solids can move into the drainfield, causing it to clog.

Conserving water in your home will reduce the load of wastewater on your septic system. In most homes, toilet flushing is the largest use of water, followed by bathing, laundry, and dishwashing. Reducing the amount of wastewater entering your system allows more time for solids to settle in the tank and less chance of these solids being carried into the drainfield. Reducing wastewater flow will provide for better treatment in your system, help prolong the life of the septic system, and reduce your energy and water bills.

Don't use your septic system as a substitute for the trash can or compost pile. Septic systems are not designed to treat the variety of household chemicals and products, like paints, solvents, acids, pesticides, and oils. These products should not be poured down the drain, instead, read the label for directions on proper disposal.

There are many steps you can take to conserve water and protect your septic system. Here are a few simple suggestions:

- ▲ Repair leaky faucets and toilets immediately.
- ▲ Install low-flow water fixtures such as toilets, showerheads, and faucet aerators.
- ▲ Take shorter showers.
- ▲ Spread laundry and other major water-using chores out over the week. Wait until washing machines and dishwashers are full before doing a load.
- ▲ Place only toilet paper in the toilet. Do not use the toilet as an ashtray or trash receptacle.
- ▲ Turn water off while brushing teeth and shaving.

Permitting and State Regulations

Contact the ISDS section of the RI Department of Environmental Management (401) 222-6820, Website: www.state.ri.us/dem/regs/isdsnew.htm

In coastal areas, contact the RI Coastal Resources Management Council (401) 222-2476

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At URI's On-Site Wastewater Training Center, examples of conventional drainfields have been installed above ground for demonstration purposes.



PVC piping installed in crushed stone. These drainfields are finished with stone over the pipe and filter fabric over the stone. Eighteen inches of topsoil is placed on filter fabric and then the area is planted in grass.



Galleys, also installed in crushed stone and finished with 18" of topsoil cover and planted in grass.



Flow diffusers are another conventional drainfield option. Installed in crushed stone and finished with 18" of topsoil and planted in grass.

For More Information: Technical Assistance, training programs and information. URI Cooperative Extension's On-Site Wastewater Training Center George Loomis, Program Director, (401) 874-4558, gloomis@uri.edu David Dow, Program Manager, (401) 874-5950, dbdow@uri.edu Website: www.uri.edu/ce/wq

Septic System Information for Rhode Islanders

MAINTAINING YOUR SEPTIC SYSTEM

Sewage Disposal Facts

Approximately 22 million households (1/3 of the U.S. population) use a septic system to treat their domestic wastewater. In Rhode Island, about 150,000 septic systems are in use. When a septic system is properly located, designed, installed and maintained, it serves as a simple, effective and economical domestic wastewater treatment system. Maintenance is typically the homeowner's responsibility and is the key to a long lasting wastewater treatment system. The homeowner can hire a professional to perform the maintenance. In some cases, the homeowner can purchase a maintenance contract similar to one you may have for your heating system. Many communities are establishing wastewater management programs, designed to manage the operation and maintenance of on-site septic systems. Each of these programs will have their own set of requirements and will differ from town to town.

How the septic system works

The standard conventional septic system consists of a septic tank followed by a drainfield, also called a leachfield or soil absorption field. Wastewater flows out of the house and into the septic tank through the building sewer pipe. Once in the septic tank, most solids, in the wastewater settle to the bottom of the tank to form a sludge layer. Other solids such as grease and fats, float and form a scum layer on top of the wastewater. The primary function of the septic tank is to trap and store solids, most of which will be broken down by anaerobic bacteria (bacteria that live without oxygen). In a properly functioning septic tank, up to 80% of the solids will be broken down into gases and liquids.

The liquid leaving the septic tank is usually cloudy and contains many pollutants and disease-causing microbes. The liquid flows into the drainfield. The drainfield may be a network of perforated plastic pipes surrounded by crushed stone, galleys, or trenches. The drainfield acts mainly to store wastewater until the wastewater flows through to the underlying soil. Treatment of the effluent occurs as it flows through the soil between the drainfield and the groundwater table.

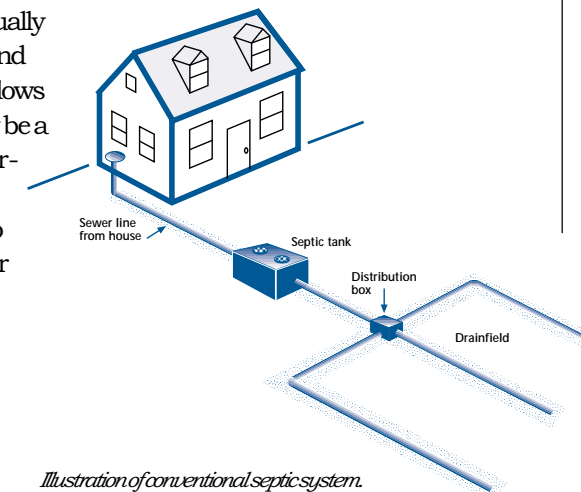


Illustration of conventional septic system.

Alternative or advanced treatment systems cover a wide variety of treatment technologies and drainfield options. Most of these systems generally include an additional treatment step, which follows the settling of solids in a watertight septic tank. A pump, which may be in the septic tank or a separate basin, is often used to convey the effluent to a treatment unit that may be placed above or below ground. Examples of treatment units include sand filters (single pass, bottomless, or recirculating), RUCK, trickling filters, aerobic units, and bio-filters, such as peat, foam, or geotextile.

The treated effluent then flows by gravity to a conventional trench or is pumped under pressure to an alternative drainfield. A pressure-dosed shallow trench located within the native soil layer discharges effluent into biologically active soils for additional pollutant removal by natural processes. This alternative drainfield can be reduced in size and site disturbance is minimized. Where pumps are used to distribute effluent to the treatment unit and drainfield, or to control a blower, an electrical control panel is used.



Installation of concrete septic tank.



Rhode Island Regional Water Quality Program
University of Rhode Island College of Environment & Life Sciences
Department of Natural Resources Science
Cooperative Extension On-Site Wastewater Training Center

Wastewater Treatment

Wastewater treatment truly begins in the home, where homeowner recognition of what should and should not enter the septic tank is critical. Once the proper type of waste enters the septic tank, biological treatment of that waste, and solids settling will begin to occur. (This is known as primary treatment.)

Wastewater flows from the septic tank and travels to the drainfield, beneath which should be a zone of unsaturated soil. Many of the harmful bacteria and microbes are filtered out as the wastewater passes through the unsaturated soil zone. Some of the smaller microbes (viruses) and nutrients such as phosphorus and some forms of nitrogen are trapped and held by soil particles. Once effluent reaches the groundwater table or underlying bedrock, little treatment occurs. Soils can differ markedly in their pollutant removal efficiency. The ability of the soil to remove pollutants impacts the quality of wastewater eventually reaching the groundwater beneath the drainfield.



Septic System Maintenance

Septic Tank

A septic tank must be maintained. Inspection is done by measuring scum depth and sludge depth in the tank on a routine basis, usually every 1–3 years. The septic tank is pumped (discussed below) based on the amount of scum and sludge in the tank. The procedure for measuring scum and sludge depth is outlined below.

During the septic tank inspection, the condition of the inlet and outlet baffles or tee assemblies should be checked for structural soundness. If you do not know where the tank is located, a steel rod gently pushed into the ground, starting ten feet from where the building sewer pipe leaves the house, should help you find it.

If the house was built since 1970, a copy of the septic system site plan may be on file at the RI Department of Environmental Management.

Always wear protective gloves and eyewear when working around your septic system.

Measuring Scum Depth

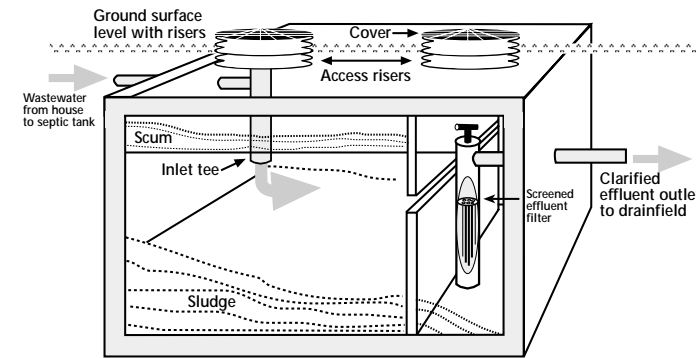
1. Attach a short board or stick to the bottom of a 6–8 foot long pole or stick to create an “L”.
2. At either the outlet end or the pump-out access of the septic tank, extend the stick down through the scum layer until you feel no more resistance (which means you have reached the liquid wastewater layer).
3. Twist the stick a quarter turn and raise the stick until you “feel” or see the bottom of the scum layer.
4. Mark this level on the stick and measure it. This is the depth of scum layer.
5. Add this measurement to the sludge depth.

Measuring Sludge Depth

1. Wrap a white rag or towel around the bottom of the 6–8 foot stick.
2. Insert the stick through the sludge to the bottom of the tank.
3. Hold the stick there for a few minutes. Make a mark on the stick to show the top of the waste level in the tank.
4. Remove the stick. Measure and note the sludge line at the bottom portion of the stick. Measure and note the total depth of the septic tank (this is the top most mark you made on the stick in step 3).
5. Add the scum and sludge depths together.
6. If the total amount of the scum and sludge depths is more than 50% of the total depth of the septic tank, then the tank should be pumped.

If you do not clean and pump your tank at these critical times, solid materials will begin to leave the tank and enter the drainfield, which will lead to system failure and costly repairs.

Basic maintenance starts with inspection. This device is used to measure scum and sludge depth in the septic tank.



Schematic of 1000 gallon, two compartment septic tank.

Septic Tank Pumping

A general rule of thumb to determine whether or not the tank needs to be pumped is that if the combined depth of the sludge and scum is greater than or equal to half the total liquid depth of the tank, the tank should be pumped.

To avoid costly repair bills, do not wait until your septic system backs up to have it pumped! When inspection results indicate pumping is needed, consult the yellow pages of your phone book under “septic” for a certified pumper in your area. A professional pumper can also perform the inspection. Some communities may offer a cash rebate to help with the cost of pumping. Ask your town building inspector or planning department if such a rebate exists in your community.

When the septic system is pumped, make sure that all solids are removed and the inlet and outlet tees or baffles are not damaged (figure 2). If either is damaged, make repairs promptly. This will prevent solids from entering the drainfield. In order to prevent the outlet from clogging with solids, clean effluent filters at time of pumping.

It is not necessary to leave any of the sludge in the septic tank as a “seed”. The incoming sewage contains all the bacteria needed for proper operation.



Access risers to grade and an effluent filter have been installed on this septic tank. These two simple retrofits allow for ease of maintenance and help to prolong the life of your system.

Drainfield

A conventional drainfield usually does not require any maintenance. However, to protect and prolong the life of the drainfield, observe these simple precautions:

1. Be absolutely sure your septic tank is in good operating order. Never allow sludge or scum to escape from the septic tank. It will clog your drainfield and cause it to fail. Observe the following “Recommendations” below.
2. If your system is equipped with a dosing chamber, be sure the submersible pump is operating properly and maintains a uniform discharge of effluent to the drainfield. You may need the help of a professional for this.
3. Keep automobiles and all heavy vehicles off the drainfield.
4. Don’t allow puddles of stormwater to form over a drainfield.
5. Don’t cover the drainfield with a hard surface such as asphalt or concrete.
6. Dense grass cover and other shallow rooted plants are beneficial over a drainfield.
7. Think ahead when planting trees and shrubs. Keep them 10 feet from drainfield. Although they promote moisture removal from the drainfield, their roots may clog nearby drain pipes.
8. Don’t stockpile snow or soil on your drainfield.
9. Don’t allow downspouts to drain onto or into your drainfield.
10. Mark the boundaries of your drainfield as a reminder.

Septic System Maintenance Recommendations

To prolong the life of your septic system and minimize maintenance costs observe the following:

1. Every 1–3 years, inspect the scum and sludge depth in your septic tank and clean the effluent filter as needed (if installed).
2. Pump tank as needed based on scum and sludge measurements. If inspections are not performed, then tanks should be pumped every 2–4 years, depending on usage.
3. Don’t use a kitchen garbage disposal unit; instead start a compost pile.
4. Don’t put harmful materials in the tank. Avoid fats, solvents, oils, disinfectants, paints, chemicals, poisons, coffee grounds, paper towels, disposable diapers, sanitary napkins, and tampons.
5. Install an effluent filter at the outlet of the tank to enhance primary treatment and protect drainfield from an overflow of solids.
6. Install a simple high-water alarm to indicate clogging or the need for tank pumping.
7. Install access risers above the inlet and outlet for easy access at time of inspection and pumping.

System Additives

The use of acids and organic chemical solvents in any septic system is prohibited under Rhode Island law. Acids will deteriorate your concrete septic tank and distribution box. These chemical additives are ineffective in cleaning the tank or drainfield and can contaminate groundwater supplies.

The use of biological enzymes and other “miracle” system additives, although not prohibited by law, have not been shown to be of any value. Similarly, hydrogen peroxide treatments have only short-term beneficial effects on drainfields. Under no circumstances should biological additives be used in place of regular pumping. For more information, see the septic system additive factsheet.