



Millions of suburban and rural New York residents depend on septic systems to treat and dispose of household wastewater. The purpose of a septic system is to store, distribute, and treat liquid wastes from your house on your property while preventing contamination of groundwater, drinking water wells, and nearby lakes and streams. When a septic system is properly located, designed, installed, and maintained, it serves as an effective, economical, and safe on-site wastewater treatment system. **Maintenance is the key to a lasting, properly functioning septic system.** This publication will help you learn how a septic system works, how to maintain it, how to prevent and recognize problems, records you should keep, and where to go for more help.

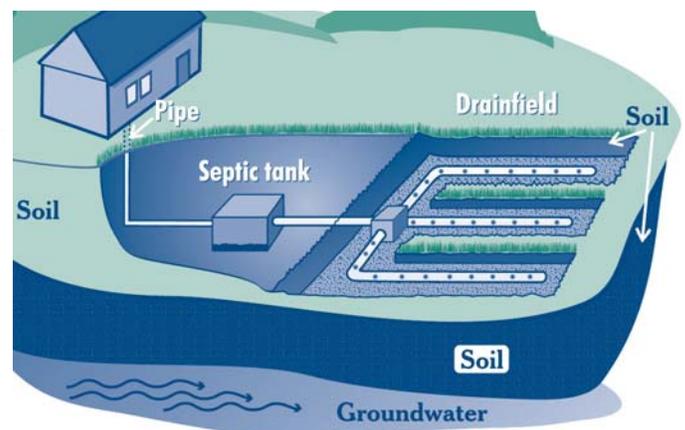
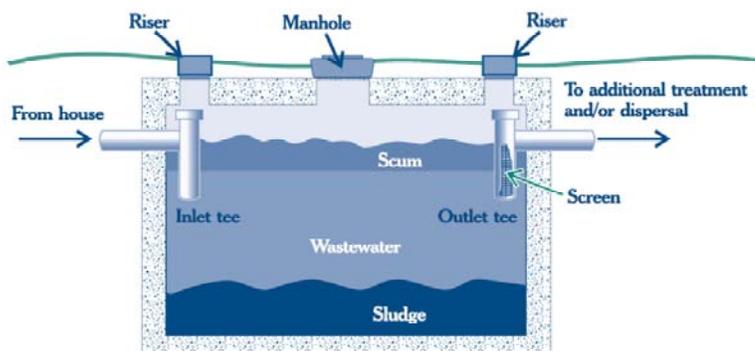
Septic System Function and Maintenance

How Your Septic System Works

Wastewater leaving your house comes from the bathtub, toilet, sinks, washing machine, and dishwasher. It carries water, solids, grease, and dissolved substances, including household chemicals. It also carries bacteria that can decompose waste, and bacteria and viruses which can cause disease. A septic system separates and treats wastewater to manage these substances. A failing septic system cannot perform these tasks, so pollution of groundwater, drinking water wells, streams, and lakes can result.

Wastewater flows from the house via a pipe into the **septic tank**. Bacteria decompose some of the waste materials. Heavy solids settle to the bottom of the tank, to form sludge. Oils and grease float to the top, forming a scum layer. Wastewater between those two layers can flow out through the exit pipe into the drainfield. Partially treated wastewater is discharged from the septic tank to a **distribution box** and through perforated pipes into a **drainfield**, sometimes called a **soil absorption field**. Here, the water is further treated by filtration through gravel and soil, chemical reactions, and decomposition by soil microorganisms. A functioning drainfield slows down and decomposes waste materials to keep microorganisms and chemicals including nutrients such as nitrogen and phosphorus from polluting lakes, streams, and groundwater. The water itself is recycled back into the environment.

Typical single-compartment septic tank with ground-level inspection risers and screen



Figures from A Homeowner's Guide to Septic Systems (U.S. EPA, 2005)

Maintaining Your Septic System

Even a properly designed and operated septic system will eventually fail unless the sludge and floating scum are periodically pumped from the tank, damaging materials are kept out of the tank, and the drainfield is protected.

Pumping Out Your Septic Tank

Generally, sludge and scum should be pumped from the septic tank every three to five years, depending on the size of the tank and the amount and composition of wastewater entering the tank. Use of a kitchen garbage disposal greatly increases solids loading, so the tank must be pumped more often. To determine a maintenance schedule for your household, have the tank inspected every two to three years and pumped as needed. Use that baseline information to plan your regular tank pumping interval. Contact a commercial septic tank inspection and pumping service, which must have permit from the New York State Department of Environmental Conservation and local authorities to transport and properly dispose of the waste. Pumping the septic system will cost several hundred dollars depending on where you live and how easy it is to access your tank.

Finding Your Septic System

In order to maintain your system, the septic tank needs to be accessible for pumping and the drainfield should be protected. Septic tanks are sometimes indicated on property survey maps. Locating your existing system is not always an easy task. If the access manhole to the tank is at ground level, it is much easier to find. Unfortunately, these manholes are often buried under lawns.

To locate your system, go into the basement or crawl space and locate the sewer pipe going out through the wall. Try to find the drainfield by checking the yard for an area where the grass grows differently, or for slightly depressed or mounded areas. The tank is located between the sewer pipe and the drainfield. Any likely site can be probed with a thin metal rod that can reach through the soil to the top of the tank. In the winter, warmth from the tank may melt snow above the tank. If you are unable to find the tank, your septic tank inspection and pumping service will use a device to find it. You may want to have the manhole extended up to just below ground level and marked clearly with a stake, rock, birdbath, or other easily moved structure.

Draw a map of your septic system on the last page of this publication or on a copy of your property survey map. Make a rough sketch locating your sewer pipe, septic tank and drainfield in relation to surrounding reference points. Begin by sketching your house, driveway, water well, and other landscape features such as trees, rocks, or fences. Measure and record distances from your house to the cover of your septic tank and to the corner of your drainfield, if possible. As long as the distances are correct, do not be concerned whether or not the drawing is to scale.

Record Keeping

Keeping a record of your septic system maintenance will help you anticipate when the next pumping is needed. You can pass this information to subsequent owners when you sell your property. Information about the tank, pumping history, and local contractors can be entered directly on the last page or kept with this publication and other records about your home.

Daily Care of Your Septic System

Protect the Drainfield and Tank

Grass and shallow rooted plants are beneficial over a drainfield. Deep roots of trees and shrubs can damage the tank and drainfield and interfere with water treatment. Do not fertilize the soil above the drainfield. Do not build patios or other structures over the septic tank or drainfield. Keep automobiles and heavy equipment off the drainfield to avoid soil compaction. Keep surface water from rain, downspouts, driveways, and sidewalks from flowing toward or pooling on top of your drainfield. If necessary, modify the landscaping to drain this water away from the septic system.

Watch What Goes Down the Drain

Do not put substances such as motor oil, gasoline, paints, solvents, or pesticides into your wastewater. Don't flush antibiotics, other prescription drugs, or over-the-counter medicines into the septic system. Take these chemicals to household hazardous waste collection events or dispose of them properly with household trash. These materials may pollute groundwater and are often toxic to the microorganisms which maintain an active system. Moderate use of household cleaners, disinfectants, detergents, or bleaches will do little harm to the septic system itself, though it may impact the environment beyond your drainfield.

Oils, fats, grease, and solids such as coffee grounds, paper towels, sanitary pads, and disposable diapers may clog your septic system. Dispose of them with your household garbage. Food scraps should be composted or disposed of with household garbage. Kitchen garbage disposals use extra energy and water, and put an extra burden on your septic system.

Avoid Commercial Septic System Additives

Commercial additives are not needed to begin decomposition after pumping because the sludge residue and incoming household wastewater already contain active microorganisms. Yeasts, bacteria, enzymes, and various chemicals are sold with the claim that they help a system work better; however, there is no scientific evidence that such additives are effective. In fact, some cleaners can cause the solids in an overloaded tank to be re-suspended and clog the drainage lines and drainfield. Additives are not an alternative to proper maintenance and do not eliminate the need for routine pumping of your septic tank.

Conserve Water and Limit the Water Entering the Tank

Remember to consider the capacity of your septic system when installing new appliances or plumbing. See the water conservation tips in the next section. Spread laundry and other tasks over the entire week. Large amounts of water entering the system in a short time can stir up solids on the bottom of the tank and push wastewater into the drainfield too quickly.

New York State Public Health Law law states: "Roof, footing, garage, cellar and surface water drainage must be excluded from the system. Water softener, water recharge and backwash wastes normally are not to be discharged to the system unless a separate subsurface discharge to an area 250 feet from wells or water courses is unavailable." Do not connect gutter downspouts, basement sump pumps, or footing drains to the septic tank. This water does not need to be treated as wastewater. Water softeners and other water treatment devices must be regenerated periodically to continue to work, and this produces a salty brine rinse. Since the brine rinse does not need to be treated with the rest of the wastewater, it can be drained separately. The National Onsite Wastewater Recycling Association and Water Quality Association are currently conducting research on the impact of water softener brine on septic systems. Problems may arise when the water softener regenerates too often. For more information see their guidance document (<http://www.nowra.org/newsrelease/Softnerguidance.pdf>).



Conserving Water in Your Home And Yard

Most of New York State has an abundant amount of water, but water conservation can extend the life of the individual homeowner's well and septic system. If you live in an area serviced by a municipal water system, the greater your water use, the more you pay for water. In addition to saving money, water conservation can help to prevent water pollution. Overloading a septic system may cause nutrient and bacterial contamination of nearby lakes, streams and drinking water sources, even your own drinking water well.

Although useful in any situation, these techniques may be especially helpful or even necessary in some cases, when water levels are high around your house, your septic system shows signs of failing or your community water system temporarily loses capacity to supply adequate amounts of water.

Water Use Indoors

The first step in understanding how to conserve water in your home is to know where water is used. Most people use 50 to 70 gallons of water indoors each day, three-quarters of that in the bathroom. Look for water conserving products at hardware and home improvement stores.

Use water conserving fixtures in repairs and new construction. See the EPA WaterSense program for tips and product information <http://www.epa.gov/WaterSense/>.

Avoid running water continuously where possible. Turn off the faucet while you are shaving, brushing your teeth or hand-washing dishes. Many water-saving shower heads and some kitchen faucets come with a button or lever to reduce the flow without changing the mix of hot and cold water.

Faucet aerators. These devices restrict the amount of water going through your faucet by up to 50 percent but add bubbles so the flow of water appears the same.

Low flow, water-saving shower heads. This plumbing device reduces the amount of water flowing through your shower by up to 50 percent, but increases its velocity.

Take short showers instead of baths. A five-minute shower uses 10-25 gallons of water, while a bath needs 50 to 60 gallons.

Avoid flushing your toilet unnecessarily. Trash that can go in the wastebasket should not be flushed down the toilet. This saves water and reduces the amount of solids in the septic tank.

Toilet dams. These devices for older high-volume flush toilets reduce the amount of water flowing out of the toilet but do not affect its flushing ability. Never use a brick to accomplish the same effect – particles from it could harm your plumbing; a sealed plastic container filled with water is a better option.

Repair leaks in your faucets and toilets. A leaky faucet can waste 10 gallons or more per day. Repairing a faucet is usually as simple as changing an inexpensive washer. Leaky toilets can waste hundreds of gallons per day. Leaky toilets often can be repaired by adjusting the float arm or plunger ball. To find out if your toilet leaks, put a little food coloring in the tank. If color appears in the bowl without flushing, you have a leak that should be repaired.

Save water and energy when using your dishwasher and clothes washer. New washing machines and dishwashers have many energy and water saving options. Use those setting to adjust the load size to save water, or run full loads on older machines. For the sake of your septic system, spread loads out across the week. This will help solids and grease separate properly in the septic tank and allow the drainfield to keep up with the volume of effluent.

Water Use Outdoors

Lawn and garden watering and car washing account for most of the water used outdoors.

Attach a pistol-type sprayer to the end of your garden hose. In addition to enabling you to adjust the rate of flow, this device keeps water from continuing to run during the short periods when you put down the hose without turning it off (e.g., while you are washing your car or doing other gardening tasks).

Water your lawn and garden only when necessary. It takes 660 gallons of water to supply 1,000 square feet of lawn with 1 inch of water. This is nearly the same amount of water as you use inside the house in an entire week! Water your lawn when it begins to show signs of wilting – when the grass does not spring back when you step on it – rather than on a regular schedule. Mowing the grass too short can cause roots to die back. Your lawn may turn brown in the middle of the summer, but this does not mean that it is dead. Rather, the grass is dormant and will grow when rain and cooler weather return. Consider using a drip irrigation system in your garden.

Use plant varieties that are well adapted to your locality and soil conditions. Less suitable varieties may need greater amounts of fertilizer and/or water just to stay alive. Contact your local Cooperative Extension office for recommendations or referrals to Master Gardeners.

Collect water from roof downspouts in a rain barrel for watering your garden and flower beds.



A septic system is “failing” when it fails to treat and distribute wastewater effectively, and fails to prevent biological and nutrient contamination of your drinking water well and nearby lakes and streams. For example, when wastewater backs up into your home or is bubbling up in your backyard, the system has obviously failed. If significant amounts of microbiological or nutrient pollutants reach your well or surface waters, the system is also failing, even though it may appear to be working. The septic system can fail when any part of the system is not operating properly, although it is often the drainfield that cannot function.

Health and Economic Effects of a Failing System

The most serious effect of a failing system is the spread of serious disease from improperly treated wastewater. Diseases including hepatitis can be spread by these wastes. In addition to these diseases, mosquitoes and flies that can spread infectious diseases can breed in areas where liquid waste reaches the surface. Household chemicals can be poisonous to humans, pets, and wildlife if they are not treated. Excess nitrate levels in drinking water can pose serious health threats to infants.

Replacing your entire septic system could cost \$5,000-\$15,000 or more. Also consider the indirect cost of losing the use of your house while the system isn't working and the long-term inconvenience of a system that doesn't operate properly. Regular maintenance and protection of your septic system is much less expensive than replacing the drainfield or entire system.

Why Septic Systems Fail

Most septic systems will fail eventually. These systems are designed to have a useful life of 20 to 30 years under the best conditions. Older septic tanks with concrete or metal parts may degrade over time. Eventually, the soil in the drainfield becomes clogged with organic material, making the system unusable. Many other factors can cause the system to fail well before the end of its “natural” lifespan. Pipes blocked by roots, soils saturated by high water tables, crushed distribution pipes, improper location, poor original design or poor installation can all lead to major problems. **By far the most common reason for early failure is inadequate maintenance by homeowners.** When a system is not pumped out on a regular basis, solids build up in the septic tank, then flow into the drainfield, clogging it beyond repair.

How to Know If Your System is Failing

Sewage backup in your drains or toilets. This is often a gray or black liquid with a disagreeable odor.

Slowly draining sinks, bathtubs and toilets. The drains in your house will drain much more slowly than usual, despite the use of plungers or drain cleaning products.

Surface emergence of wastewater. Sometimes you will notice soggy areas or standing water on the ground above or near your tank or drainfield. There may or may not be a foul odor.

Lush green grass over the drainfield, even during dry weather. Often, this indicates that an excessive amount of liquid and nutrients from your system is moving upward through the soil instead of downward, as it should. While some upward movement of liquid from the drainfield is normal, too much indicates a problem.

Nitrate, nitrite, or coliform bacteria in your well water. These may indicate that wastewater from the system or another source of surface contamination is reaching the well. Drinking water wells should be tested annually for these substances. Use a testing lab certified by the New York State Department of Health. A directory of labs is available at this website – look for potable water testing labs in your county or adjacent counties.

<http://www.wadsworth.org/labcert/elap/comm.html>

Unpleasant odors around your house. This may indicate a problem with the septic system drainage or with the household plumbing ventilation.

See the section below on shoreline septic systems for additional symptoms in those settings.

What to Do if Your System Fails: Immediate Actions

First, call your local health department. Health department staff have the expertise to assess your situation quickly and offer advice. See contact information on the last page of this publication.

Fence off the septic system area. If liquid waste is seeping to the surface, prevent people and pets from coming into contact with the effluent.

Exercise caution in working near an opened septic tank. Toxic and explosive gases present a hazard. *Never enter a septic tank!*

Have your septic tank pumped. This will help the problem temporarily, especially when it is combined with drastic water conservation. If the drainfield is still in good condition and the septic tank is large enough for the wastewater volume leaving the household, pumping may be an effective solution.

Conserve water in your home. This is particularly effective if your system has not failed completely. It can help lessen the problem for a short time. See the section on water conservation above for tips.

What to Do If the System Fails: Long-Term Options

In many cases, redesigning and replacing the drainfield or entire system in a new location is the only practical long-term solution. This type of work only should be performed by a qualified contractor. Local health department permits are required before construction can begin. See the section below on Building or Remodeling a Home with a Septic System for tips on siting and design features to include. Additional solutions:

Increasing the size of the drainfield. This may help if the original drainfield was too small for the size of your family or if the soil does not allow water to percolate very well, provided that the tank size is adequate.

Conserving water in your home on a long-term basis. See the section on water conservation for tips.

If periodically saturated soils are a main cause of problems, consider installing perimeter drains. This involves installing tile drains underground at a distance around the drainfield to help lower soil water levels. It works in some but not all situations and requires the assistance of a qualified contractor. The location should also be evaluated by your local health department.

Incorporating advanced or alternative treatment technologies. On small lots, property near shorelines, or land with inadequate soil for a traditional drainfield, other technologies may be used as part of your on-site wastewater treatment system. See the separate section below for examples.

Connecting to a community sewage system, if one is available. Although the long-term costs may seem high, the benefit of reduced worry and lowered maintenance for the homeowner are often worth the cost.

If septic system failures are common in your area, consider participating in the development of a small community cluster system or other on-site wastewater treatment system (OWTS) alternative. These systems are designed for small communities and some rural areas and are generally much more cost effective than a conventional sewage treatment system.



Your Septic System: Special Considerations for Shoreline Property Owners

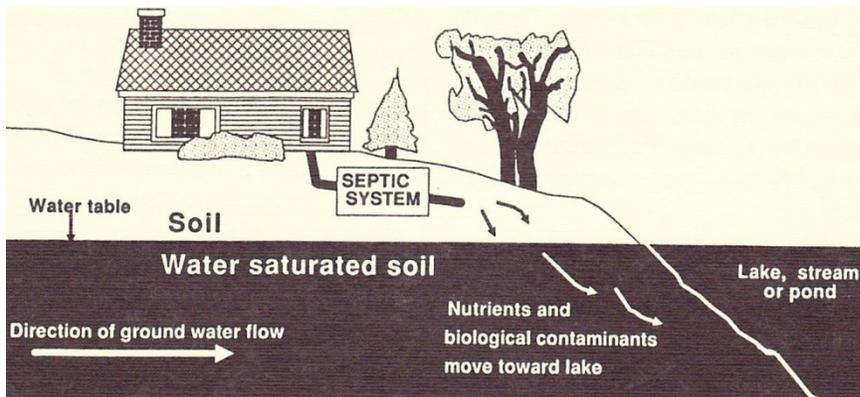
If you live on shoreline property, maintaining your septic system requires more care than maintaining a similar system located elsewhere. Remember that most wastewater treatment happens in the soil below the drainfield. Septic systems on shoreline property are often close to both groundwater and surface waters, and drainfields are sometimes saturated during high water periods, such that partially treated wastewater is likely to enter adjacent lakes and streams. Also, as shorelines erode, the distance between the septic system and the shoreline decreases. Soil and water conditions near the shoreline, including thin or rocky soils, clay soils, and high water tables, may make a traditional septic system less efficient at treating waste. The system must be customized to the specific site and may need to employ more advanced treatment technology. Water pollution can happen even though your system appears to be working well and complies with local health department codes. Water conservation and spreading the wastewater load over time can be especially important at shoreline properties.

The Effects of Septic System Wastes on Lakes and Streams

Nutrients (especially phosphorus) from leaky septic systems play a major role in causing excessive weed and algae growth in lakes and ponds. Just a small amount of additional phosphorus in a lake or pond can increase the growth of algae and/or aquatic weeds. When overgrown algae and plants die rapidly and decompose, oxygen is removed from the water, which threatens fish and other aquatic animals. Excessive weed growth also makes boating, fishing and swimming less enjoyable.

Wastewater from your septic system that reaches adjacent surface waters also increases the chance that wildlife, swimmers, and downstream users are exposed to infectious bacteria and viruses that are associated with wastewater.

When septic systems are near lakes, ponds or streams, the water table is often close to the surface, and the drainfield near open water. This can result in nutrients and biological contaminants reaching the water, causing excessive weed and algae growth in lakes and ponds and increasing the risk of disease.



Signs That Contaminants are Reaching the Water

In addition to the symptoms of septic system failure described on the previous pages, look for these symptoms to tell if waste from your system is reaching surface water:

Excessive weed or algae growth in the water near your shore. Phosphorus leaking from septic systems can be a major cause of this type of growth. Other nutrient sources, such as sediment and lawn fertilizer runoff, or the resuspension of shallow sediments, could also lead to this type of problem. Septic systems, however, are often prime suspects as sources of nutrients.

Unpleasant odors, soggy soil or sewage flow over the land surface. These symptoms often indicate failure and the need for drastic action such as replacement of the system. Under these conditions, wastewater could travel directly into nearby surface waters instead of being treated in the soil.

Water test results indicate the presence of biological contamination.

These tests may show the presence of harmful bacteria, viruses, or protozoa in the water. Although wastes from septic tanks are not the only source of these contaminants, they are likely suspects. Contact your local health department for more information on testing programs (see contact info on the last page on this publication).

An increase in infections or illnesses associated with swimming in the area. These are most often minor ailments, such as ear or eye infections, but could be major diseases, such as dysentery or hepatitis.

Indicator dye put into your septic tank reaches lakes or ponds.

Special dyes may be available from your local health department and may help to find problems that may otherwise be difficult to notice. This method can help verify the other symptoms listed above.

How to Prevent Problems

The basic maintenance for all septic systems (regular pumping and maintenance, water conservation, and protecting the drainfield) is even more important near surface waters. In addition to the tips described above, consider these measures.

Participate in a community sewage system, if available. Municipal sewer systems may not be accessible at a reasonable cost, but multiple-home “cluster” systems may be an option. Talk with your neighbors, lakeshore association, and health department about possible community solutions. Before selecting a larger-scale, community-based solution, be sure that it will yield the anticipated results. Many factors contribute to excessive weed growth and other water quality effects.

Replace or upgrade your septic system. Although this alternative is costly, sometimes it is the only alternative, especially when your system is undersized because of conversion of a seasonal residence for year-round use. If you're building a new home, construct the septic system as far away from the shoreline as possible. This distance should be even farther than health department codes require. Those regulations are designed primarily to protect human health rather than prevent other effects, such as excessive weed growth. Also, design the system to meet your present as well as future needs. If you are building a small summer home with plans to enlarge it for year-round use when you retire, design the system to accommodate that increased future use.

Install an “alternative” or “advanced” treatment system. A septic system is one type of on-site wastewater treatment system (OWTS). See the section below on Alternative and Advanced OWTS for more information on these systems, which use modifications of traditional septic tanks or drainfields to improve treatment efficiency and protect groundwater. Installation of these systems requires close cooperation with your local health department, an experience contractor, and the manufacturer. Some systems require electric power to operate.

Consider a waterless toilet. Incinerator or composting toilets greatly reduce the volume of wastewater that must be treated. Talk to your local health department about waste disposal options and permits.

Add appropriate plants between your drainfield and the shoreline. This involves planting areas of small shrubs and trees to help intercept and absorb some of the nutrients before they reach the shoreline. Roots may also stabilize the shoreline and reduce erosion that can contaminate the stream and expose the far end of the drainfield. Make sure roots will not damage the drainfield.



Buying or Selling a House with a Septic System

Since the septic system is part of the home's life support system, it needs to receive attention before property transactions are underway. Inspections may be required by local regulations or the mortgage lender. This general guide is not a substitute for inspection by an engineer, building inspector, or wastewater professional. If the property has a drinking water well, it should also be evaluated.

Age of the System

The age of the house will give clues to the condition and type of septic system. Houses built in the last 30 years may be using the original waste disposal system. Older houses may have had the original system or components replaced. Just because the system is over 10 years old does not mean you will need to replace it soon. If the tank has been pumped regularly and the drain field treated properly, the septic system may function for many years. As most homeowners learn, parts of the house wear out, so a replacement fund is a good idea.

The County Health Department may have records from construction permits and the certificate of occupancy that indicate when the system was installed or modified. If these forms are not available from the health department, the system may be very old and need replacement, a true treatment system may not exist (wastes from the home may be just discharged into a dry well or cesspool), or it may have been installed without the health department's knowledge or approval.

Size of the System

Septic systems usually are designed to adequately treat sewage based on 110-150 gallons per day per bedroom, depending on the age of the fixtures (e.g., newer toilet use less water). This estimate assumes that two people will occupy each bedroom. Both the buyer and seller benefit from knowing this. Buyers need to know if the functioning system is large enough to adequately handle the new family's wastewater. A potential homeowner who is aware of an undersized system can plan to expand or replace the system or buy a different house. If the seller is aware of the size of the system, the real estate agent and the potential buyer should be informed.

Evaluating the System

A septic system evaluation should be conducted early in the selling process so that any necessary repairs can be made. Even a professional inspection may fail to identify septic system deficiencies or problems if the house is vacant. The buyer should make certain the evaluation was done when the system was being used normally for the previous thirty to sixty days. Inspections during the winter can be more difficult. At a minimum, a septic evaluation should examine:

Accuracy and availability of the Construction Permit and the Certificate of Occupancy.

Spatial layout of the septic system components. Are any inappropriate water sources such as roof or sump pump drainage entering the system? Is the system located far enough from the drinking water supply and surface water? (See the next section and state and local regulations for separation distances.)

Age of the septic system components. Have additions or plumbing fixtures been added or modified after septic system installation, and if so, is the septic system still appropriate?

Size and type of septic tank (concrete, plastic, or steel). Does it have access risers? Are baffles and screens working properly? Is the capacity adequate for the prospective buyers?

Records of previous septic tank pumping.

Soil conditions, drainage, and flooding potential where the septic system is located, especially the drainfield. Does the ground slope toward the septic tank or drainfield? Are there signs of septic system failure such as lush grass, standing water, or odors? Is the soil over the drainfield compacted? Note driveways or other evidence of vehicles.

Building or Remodeling a Home with a Septic System

Wastewater treatment is an important part of home design. This section is designed to help you understand siting and design options and the installation process for a new system. You will safeguard your family's health, maintain the value of your property, protect the environment, and save money by doing it correctly the first time. Be sure the system is designed to meet your present and future needs. For example, if you are building a small home with plans to enlarge it as your family grows, design the septic system to accommodate the larger size.

If you are modifying an existing home you need to consider how the alterations will affect the wastewater disposal process. Adding occupants, bathrooms, garbage disposals, or other appliances will increase the volume of wastewater your system must handle. In addition, it is important to know where your septic system is located so you do not damage it as you work on the foundation or bring construction equipment onto the site. Be sure that additions, detached buildings, and paved areas will not be located over your septic tank or drainfield.

State Department of Health regulations apply to the installation of septic systems, and regulations set by counties and in particular watersheds may be more strict. **Consult your County Health Department during the design and installation process.** Contact information is provided on the last page of this publication. The permitting process may include soil tests, specifications based on the soil conditions and anticipated use, and inspections during construction.

Siting Considerations

Because the soil is the critical factor in the treatment of household wastewater, it determines the type of system that can be installed. There must be enough area and depth of the proper type of soil to treat effluent. A basic septic system must be outside the ten-year flood zone and on less than a 15% slope. More than four feet of suitable soil must underlie the proposed drainfield area.

The wastewater treatment system must be separated from water sources and property features, as summarized in the table below. For all current separation distances, consult your local regulatory agencies. Note that shoreline property owners should try to maximize separation distances to reduce the risk of surface water pollution.

Minimum Separation Distances From Wastewater System Components (in feet; excerpts from Table 2 of NYS DoH Appendix 75-A Wastewater Treatment Standards - Individual Household Systems
http://www.health.ny.gov/regulations/nycrr/title_10/part_75/appendix_75-a.htm#a4)

System Component	Well	Stream, Lake, or Wetland	Dwelling	Property Line
Septic tank	50	50	10	10
Distribution box	100	100	20	10
Absorption field	100	100	20	10
Mound system	100	100	20	10
Sand filter	100	100	20	10

In areas where conditions are *not* suitable for a traditional septic tank and soil absorption drainfield, alternatives may be used. These are covered in more detail in the section below on Alternative and Advanced On-site Wastewater Treatment Systems.

Percolation Test

The health department sanitarian will recommend a system based on the results of a percolation test. The basic idea of a percolation test is to see how long it takes a set volume of water to soak into the soil. Several holes may be dug, filled with water, and tested. The soil absorption system needs to be able to drain water quickly enough to prevent surface contamination, but slowly enough to allow physical, chemical, and biological treatment before the water reaches groundwater below.

Design and Installation

New York’s Public Health law mandates minimum sizes and surface area for septic tanks. See the table below for basic guidelines, and consult the full document for details on septic system models and installation, and what counts as a possible bedroom. Although these minimum capacities will safely handle the family's wastes, installing larger size tanks allow for better separation of scum and solids, resulting in fewer solids entering the drainfield and prolonging the life of your system. They also require less frequent pumping and allow for future expansion of the home. In the long run, they are more cost-effective. Garbage grinders or disposals are not recommended for use with septic systems because they increase the necessity of pumping. The required minimum septic tank size increases with a garbage disposal. Two tanks can be used in series to improve settling of solids from effluent and are required for some drainfield types; the total volume capacity applies.

Minimum Septic Tank Capacities
 (from Table 3 of NYS Department of Health
 Appendix 75-A Wastewater Treatment Standards
 - Individual Household Systems
http://www.health.ny.gov/regulations/nycrr/title_10/part_75/appendix_75-a.htm#a6)

Bedrooms	Minimum Tank Capacity (gallons)	Minimum Liquid Surface Area (sq. ft.)
1-3	1000	27
4	1250	34
5	1500	40
6	1750	47

Most septic tanks are made of concrete and more recently plastic and will last a long time especially if the baffles are made of concrete or plastic. Some metal tanks are still being used, but they do not have as long a life expectancy because the metal above the liquid level eventually rusts. Although steel septic tanks can be installed in New York State if they are certified for corrosion resistance, they are not recommended.

Consider asking your contractor to include such useful features as risers, junction boxes, and observation ports, which aid in assessing the condition of the system in the future.

The design specifications for the drainfield depend on the results of your percolation test and estimates of your household water usage. See the state regulations for details.

Once your waste disposal system is in use it will need regular care and maintenance as described in the introduction to this publication. Use paperwork from the septic system installation process, a copy of the property survey map, or the space on the last page of this publication to document the layout of the new septic system. Also make sure you record information about the installers and date of last pumping.

Alternative and Advanced On-site Wastewater Treatment Systems

Some properties do not have a large enough area, gradual slope, deep enough soil, or the right type of soil for installing conventional septic system composed of a concrete tank and soil absorption drainfield. This is often the case for shoreline properties in New York where thin rocky soils, steep slopes, and small lot sizes combine to create a wastewater treatment challenge. On-site wastewater treatment system (OWTS) can still be installed but may require the use of multiple or modified tanks and/or modified drainfields. New York State Public Health Law regarding OWTS was updated in 2010, and new technologies are being developed by the industry. Note that evapo-transpiration systems were removed from the list of approved systems in 2010. You should work with your county health department to make sure your alternative OWTS design meets current state and local regulations. Look into warranties and service contracts on advanced systems.

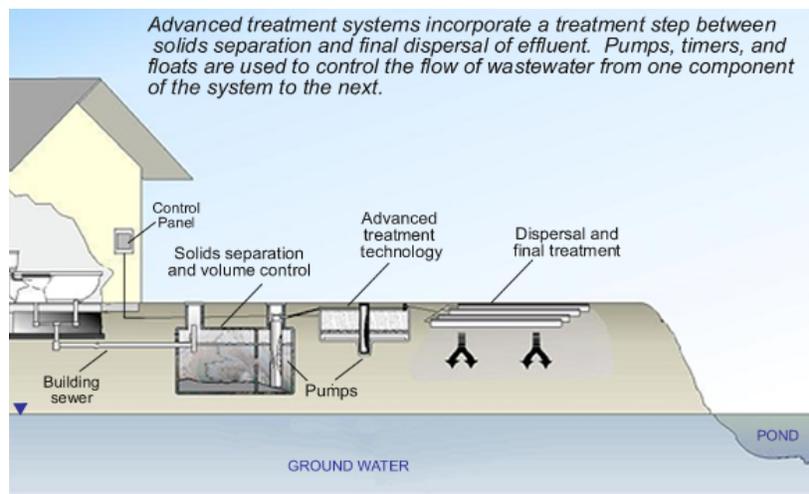
Enhanced Treatment Units (ETUs) are modified septic tanks designed to treat wastewater more thoroughly than a traditional septic tank. They may allow use of a smaller drainfield than would be permitted with a standard septic tank. They are certified by organizations such as NSF International. This section was added to the New York State regulations in 2010.

New York State Public Health Law regarding OWTS covers three main types of **alternative drainfield systems**. Each has appropriate site, design, and construction requirements specified in the regulations.

Raised Systems. “A raised system is an absorption trench system constructed in fill material with acceptable permeability placed above the natural soil on a building lot.”

Mounds. “A mound system is a soil absorption system that is elevated above the natural soil surface in a suitable fill material. It is a variation of the raised bed utilizing sandy fill material but not requiring a stabilization period prior to the construction of the absorption area. On sites with permeable soils of insufficient depth to groundwater or creviced or porous bedrock, the fill material in the mound provides the necessary treatment of wastewater. The overall size of the mound system will normally be substantially smaller than a raised bed.”

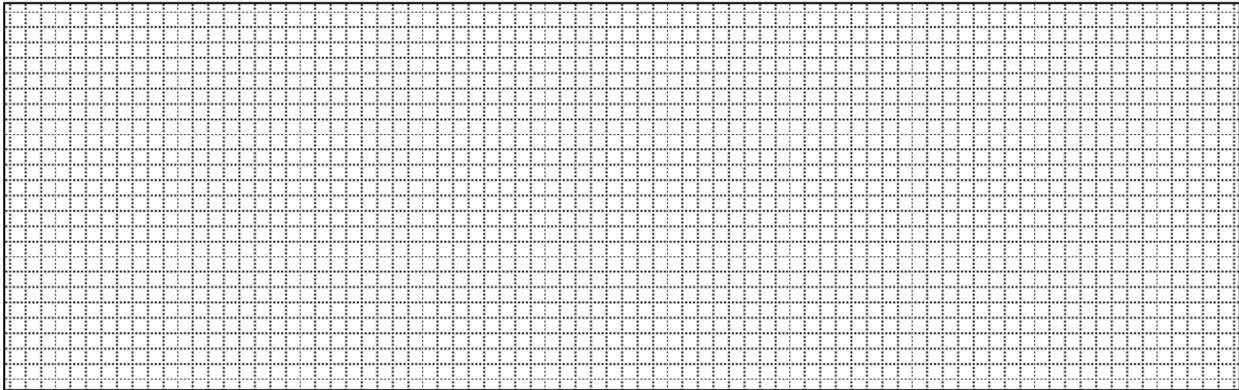
Intermittent Sand Filters. “In a sand filter, the septic tank or aerobic unit effluent is intermittently spread across the surface of a bed of sand through a network of distribution lines. Collector pipes beneath the filter collect treated effluent after it has passed through the sand.” Note that “Septic tanks installed before a sand filter shall have dual compartments or two tanks in series.”



courtesy University of Rhode Island Onsite Wastewater Resource Center
http://www.uri.edu/ce/wq/RESOURCES/wastewater/Onsite_Systems/Advanced/index.htm

Septic System Records

Location of Septic System Components: Make a rough sketch below or on a copy of your property survey map. Note landmarks and the location of the sewer pipe, septic tank, and drainfield.



<p>Septic Tank Info (if known)</p> <p>Volume: _____ gallons</p> <p>Dimensions: _____ L _____ W _____ D</p> <p>Tank material: _____</p> <p>Septic system installer:</p> <p>Name: _____</p> <p>Phone: _____</p> <p>Address: _____</p> <p>_____</p> <p>Installation Date: _____</p>	<p>Local Septic System Companies</p> <p>Name: _____ Phone: _____</p> <p>Name: _____ Phone: _____</p>																																			
<p>Maintenance Record - Inspection, Pumping, Repairs</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Date</th> <th style="text-align: left; border-bottom: 1px solid black;">Work Done</th> <th style="text-align: left; border-bottom: 1px solid black;">Company</th> <th style="text-align: left; border-bottom: 1px solid black;">Cost</th> <th style="text-align: left; border-bottom: 1px solid black;">Notes</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Date	Work Done	Company	Cost	Notes																														
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Contact Information and References

Your County Health Department—consult them for guidance and permits for septic system installation and repair. Some counties use a regional office of the New York State Department of Health <http://www.health.state.ny.us/nysdoh/lhu/map.htm>

New York State Department of Health regulates septic system installation and certifies water testing laboratories
http://www.health.state.ny.us/environmental/water/drinking/appendix_75a.htm
http://www.health.ny.gov/environmental/water/drinking/wastewater_treatment_systems/design_handbook.htm
<http://www.wadsworth.org/labcert/elap/comm.html>

Your Cornell Cooperative Extension County Office http://cce.cornell.edu/learnAbout/Pages/Local_Offices.aspx

Local Soil and Water Conservation District Office; Lakeshore or Watershed Associations or Other Local Groups

Cornell Cooperative Extension Consumer Water Quality Program, Cornell Univ., Ithaca NY 14853, 607-255-1943 <http://waterquality.cce.cornell.edu/septic.htm>

A Homeowner's Guide to Septic Systems (U.S. Environmental Protection Agency, 2005) http://www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf

Maintaining Your Septic System - A Guide for Homeowners (National Small Flows Clearinghouse, 2004) http://www.nesc.wvu.edu/pdf/ww/septic/pl_fall04.pdf

New York State Federation of Lake Associations – Diet for a Small Lake <http://www.nysfola.org/diet/>

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