

# Your Septic System

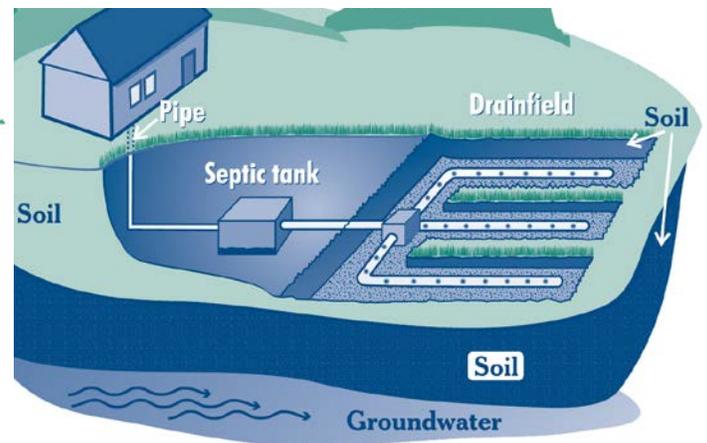
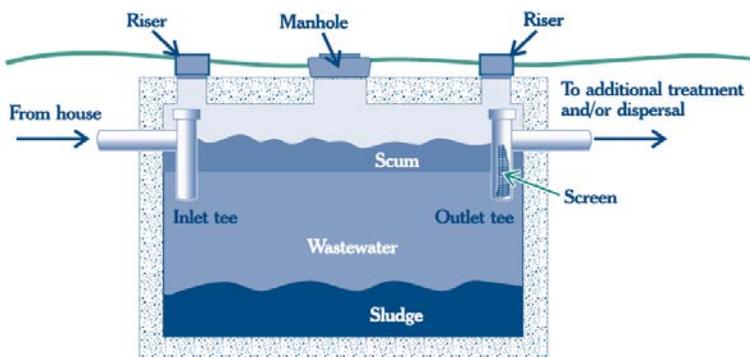
Millions of suburban and rural New York residents depend on septic systems to treat and dispose of household wastewater. The purpose of a septic system is to store, distribute, and treat liquid wastes from your home on your property while preventing contamination of groundwater, drinking water wells, 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

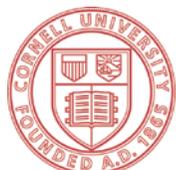
Household wastewater carries water, solids, grease, and dissolved substances, including household chemicals. It also carries bacteria that can decompose waste, and bacteria and viruses which can cause disease. A septic system treats wastewater in stages to manage these substances. A failing septic system is one that cannot perform these tasks, putting human health and water resources at risk.

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



The figures above show the basic parts of a septic system (from *A Homeowner's Guide to Septic Systems*, US EPA 2005). 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, which should have a screen or filter to block large particles. Note that two-compartment septic tanks or two septic tanks in series are recommended and sometimes required in New York State.

The partially treated wastewater is discharged from the septic tank to a **distribution box** and through perforated pipes into an **absorption area**, also called a **leachfield** or **drainfield**. Here, the water is further treated by filtration through gravel and soil, chemical reactions, and decomposition by soil microorganisms. The water itself is recycled back into the environment, making this a decentralized or **on-site wastewater treatment system (OWTS)**.



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## **Maintaining Your Septic System**

The design life of a septic system is usually several decades. Keep your septic system functioning properly with regular maintenance.

### **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 sink grinder 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 permits from the New York State Department of Environmental Conservation to transport and properly dispose of the waste. Pumping the septic system will cost a few hundred dollars. This is much less expensive than replacing parts of your system.

### **Finding Your Septic System Components**

- In order to maintain your system, the septic tank needs to be accessible for pumping and the absorption area should be protected. Check with your county health department to find out what records they have about your system. Septic tanks are sometimes indicated on property survey maps. If the access riser to the tank is at ground level, it is easy to find, but it may be buried under the lawn.
- Locate the sewer pipe leaving your home. Try to find the absorption area by checking the yard for an area where the grass grows differently or there are mounded areas or trenches. The tank is located between the sewer pipe and the absorption area. 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 household water 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 an access riser extended to the surface or just below ground level and marked clearly with a stake, rock, or other easily moved structure.
- Draw a map of your septic system on the back of this publication or a copy of your property survey map. Sketch your house, driveway, water well, and other landscape features such as trees, rocks, or fences. Sketch your sewer pipe, septic tank, and absorption area in relation to other features. Measure and record distances from your house to your septic tank and to the corner of your absorption area, if possible. As long as the distances are correct, do not be concerned whether or not the drawing is to scale.

### **Recordkeeping**

- 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. Write information about the tank, pumping history, and local contractors directly on the back of this publication or keep receipts and notes in the folder. Store this folder with other records about your home.

## Daily Care of Your Septic System

### Protect the Tank and Absorption Area

- Grass and other plants with shallow roots are beneficial over an absorption area. Deep roots of trees and shrubs can damage the tank or absorption area. Do not fertilize the soil above the absorption area.
- Do not build patios or other structures over the septic tank or absorption area.
- Keep automobiles and heavy equipment off the absorption area to protect system parts and avoid soil compaction.
- Keep surface water runoff from rain, downspouts, driveways, and sidewalks from flowing toward or pooling on top of your absorption area. 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 medications. 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 that break down wastes. For disposal info see [dontflushyourdrugs.net](http://dontflushyourdrugs.net) and [www.dec.ny.gov/chemical/8485.html](http://www.dec.ny.gov/chemical/8485.html)
- Use household cleaners, disinfectants, detergents, and bleach in moderation.
- Oils, fats, grease, and solids such as coffee grounds, paper towels, sanitary pads, and disposable diapers will clog your septic system. Dispose of them in household garbage.
- Food scraps should be composted or disposed in household garbage. Kitchen sink grinders use extra energy and water, and put an extra burden on your septic system.

### Avoid Commercial Septic System Additives

- Commercial additives are not needed after pumping. 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 additives can cause the solids in an overloaded tank to be re-suspended and clog the drainage lines and absorption area. 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

- Conserve water and choose fixtures and appliances that reduce water use.
- 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 absorption area too quickly. Spread laundry and other tasks that use a lot of water over the entire week.
- Do not connect gutter downspouts, basement sump pumps, or footing drains to the septic tank. This water does not need to be treated with the household wastewater.
- Water softeners and other water treatment devices have parts that must be regenerated to continue to work. This produces a very salty brine that can negatively affect septic systems. It is important that treatment devices recharge based on actual use and concentrations rather than by the clock. Since the brine rinse does not need to be treated with the rest of the household wastewater, it can be sent to a separate drainfield. For more information, consult your county health department and see the NYS DOH Residential OWTS Design Handbook (link on the back cover) and the NOWRA and WQA guidance document <http://www.nowra.org/newsrelease/Softnerguidance.pdf>.

# 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, distribution box, and absorption area.

System Information	
Installation date:	_____
Tank volume:	_____ gallons
Tank dimensions:	___ L ___ W ___ D
Tank material:	_____
Absorption system type:	_____
System designer:	_____
Phone:	_____
System installer:	_____
Phone:	_____

Maintenance Record - Inspection, Pumping, Repairs				
Date	Work done	Company	Cost	Notes

Service Companies	
Name:	_____
Phone:	_____
Name:	_____
Phone:	_____
Name:	_____
Phone:	_____

## Contact Information and References

**Consult your County Health Department for guidance and permit information.** <http://www.health.ny.gov/contact/>

Many municipalities and watersheds have local regulations about on-site wastewater treatment.

Some counties receive environmental health services from a regional NYS Department of Health District Office

**New York State Department of Health** sets design standards for on-site wastewater treatment and certifies water testing laboratories

[http://www.health.state.ny.us/environmental/water/drinking/appendix\\_75a.htm](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.health.ny.gov/environmental/water/drinking/wastewater_treatment_systems/design_handbook.htm)

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

**Cornell Cooperative Extension Consumer Water Quality Program,**

Cornell University, 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](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](http://www.nesc.wvu.edu/pdf/ww/septic/pl_fall04.pdf)

**Your local Cornell Cooperative Extension (CCE) County Office**

<http://cce.cornell.edu>

**New York State Federation of Lake Associations**

**Diet for a Small Lake**

<http://www.nysfola.org/diet/>

**County Soil and Water Conservation District Office, Lakeshore or**

**Watershed Associations or Other Local Groups**

The original version of this publication was developed by CCE via a grant from the NYS Water Resources Institute with funds provided by the NY State Legislature through the Dept. of Agriculture and Markets. The project team included A. Meyer, M. Keith, J. Saumier, and M. Shortlidge of Dutchess, Putnam, Rockland, and Westchester Counties. It was revised by A. Galford with input from county and NYS health departments and the CCE Water Resources PWT. This material is based upon work supported by Smith-Lever funds from the National Institute of Food and Agriculture, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Dept. of Agriculture. Printed 01/2013.

# **Your Septic System: Buying or Selling a House with a Septic System**

A properly functioning wastewater system is a critical home asset. This guide is a starting point for evaluating a septic system but is not a substitute for inspection by an engineer, building inspector, or wastewater professional. Inspections may be required by local regulations or the mortgage lender. If the property has a drinking water well, it should also be evaluated. Consult your county health department.

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.

## **Age of the System**

The county health department may have records from construction permits and the certificate of completion that indicate when the system was installed or modified. See contact info on the back of the Your Septic System folder. If these forms are not available from the health department, the system may be very old and need replacement or it may have been installed without the health department's approval. 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 original or replacement components. Well-maintained systems last for decades, but a replacement fund is a good idea. Have there been additions or plumbing fixture modifications after the septic system installation? If so, is the system still appropriate?

## **Size of the Septic Tank**

Septic systems are designed according to the expected wastewater volume, based on the number of bedrooms and age of fixtures. Is the capacity adequate for the prospective buyers? Are they planning to expand their family or the home?

## **System Components**

What is the size and type of septic tank (concrete, plastic, or steel)? Does it have access risers? Are gas baffles and effluent screens working properly?

Look at drainage and flooding potential where the septic system is located, especially the absorption area. Does the ground slope toward the septic tank or absorption area? Are there signs of septic system failure such as lush grass, standing water, or odors? Has vehicle traffic compacted the soil over the absorption area?

Try to determine the 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 properly separated from drinking water supplies and surface water?

Can the owners provide records of septic tank pumping, inspection, or other maintenance?

The original version of this publication was developed by Cornell Cooperative Extension (CCE) via a grant from the NYS Water Resources Institute with funds provided by the NY State Legislature through the Dept. of Agriculture and Markets. Jo Ellen Saumier of Cornell Cooperative Extension of Rockland County adapted it from a Michigan State University Cooperative Extension Service bulletin. It was revised by A. Galford with input from county and NYS health departments and the CCE Water Resources PWT. This material is based upon work supported by Smith-Lever funds from the National Institute of Food and Agriculture, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Dept. of Agriculture. Printed 01/2013



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# Your Septic System: Building or Remodeling a Home with a Septic System

This guide introduces siting and design requirements for septic systems. Following design criteria will help safeguard your family's health, maintain the value of your property, and protect the environment. In new construction, be sure the system will 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, consider how alterations will affect the wastewater disposal process. Adding occupants, garbage disposals, or other appliances can increase the volume of wastewater and solids your system must handle. Know where your septic system is located so you do not damage it during other work. Be sure that additions, detached buildings, and paved areas will not be located over your septic tank or absorption area.

## Follow Local Regulations

State Department of Health regulations apply to the installation of septic systems, and regulations set by counties and in particular watersheds may be more restrictive. Consult your County Health Department and local code enforcement officer during the design and installation process.

## Soil and Site Characteristics

Soil conditions determine the type of system that can be installed. For a traditional septic tank and drainfield system, there must be enough area and depth of the proper type of soil to treat effluent from the septic tank. The system must be outside the ten-year flood zone and not on an excessively steep slope. A percolation test will be conducted 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.

The on-site wastewater treatment system must be separated from water sources and property features, as summarized in the table below (minimum distances; check current local regulations). 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 Dept. 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#a4](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 area	100	100	20	10



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In areas where conditions are *not* suitable for a traditional septic tank and soil absorption drainfield, alternatives may be used. These systems are introduced in the publication Alternative and Advanced On-site Wastewater Treatment Systems.

### **Septic Tank Size, Design, and Installation**

New York State Department of Health regulations mandate minimum sizes and surface area for septic tanks. See the table below for basic guidelines, and consult the full reference for details on septic system models and installation and what counts as a possible bedroom. County sanitary codes and watershed regulations may also apply. Note that these are minimum capacities; installing a larger tank allows for better separation of scum and solids from wastewater, resulting in fewer solids entering the absorption area and prolonging the life of your system. A larger tank may also require less frequent pumping and allow for future expansion of the home. 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. Use of a two-compartment tank or two tanks in series improves settling of solids from effluent and is 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](http://www.health.ny.gov/regulations/nycrr/title_10/part_75/appendix_75-a.htm#a6))

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

Most septic tanks are made of pre-cast concrete, cast-in-place concrete, fiberglass, or polyethylene. Steel septic tanks can be installed in New York State if they are certified for corrosion resistance but tank coatings must be refinished if damaged.

Consider asking your contractor to include such useful features as risers, junction boxes, and observation ports to make future maintenance easier.

Effluent passes from the septic tank through pipes to a distribution box or similar device, and from there to trenches or other structures in the absorption area. The design specifications for the absorption area depend on the results of your percolation test, estimates of your household water usage, soil characteristics, and other factors. See state and local regulations for details.

Document the layout of the new septic system for future reference and record information about the installer(s). Once your waste disposal system is in use it will need regular maintenance. Keep records of what service is performed, when, and by whom.

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# Alternative and Advanced On-site Wastewater Treatment Systems

Some properties lack the volume and type of soil needed for a conventional septic system composed of a septic tank and soil absorption drainfield. This is common in many regions of New York State. On shoreline properties, thin rocky soils, steep slopes, and small lot sizes combine to create a wastewater treatment challenge. The original septic system on a property may have reached the end of its design life or failed early without enough room for replacing it with the same type of system.

An on-site wastewater treatment system (OWTS) may be possible but require the use of multiple or modified tanks and and/or modified absorption area technologies. These “alternative”, “advanced”, or “enhanced” systems have undergone much recent technological and regulatory change, reflected in changes in NYS Dept. of Health regulations in 2010 and the revised Residential OWTS Design Handbook in 2012. Consult your county or district health department for options on challenging sites (contact info on the back of the Your Septic System folder).

Some of the treatment principles employed in these systems and examples of techniques include:

- Increasing the surface area on which bacteria live
  - Use high surface area materials
  - Spread small volumes of wastewater across a wide area
- Increase the treatment time before wastewater is released to the absorption area
  - Distribute effluent gradually using timed doses
  - Recirculate wastewater through treatment components multiple times
- Promote the growth of aerobic (oxygen-using) bacteria in the system
  - Add oxygen to the storage tank by bubbling air into it
  - Add oxygen to the storage tank by physically mixing the tank contents
- Artificially create absorption areas with deeper and different soil
  - Pump effluent up to mounds or other artificially built systems

These systems can achieve remarkable effluent water quality but they present some challenges.

- Custom engineering, installation, and permitting.
- Some components require electricity for pumps, aeration, control panel, alarm system, etc.
- Service contracts for inspection, parts, and pumping are a good idea and often required for permitting.

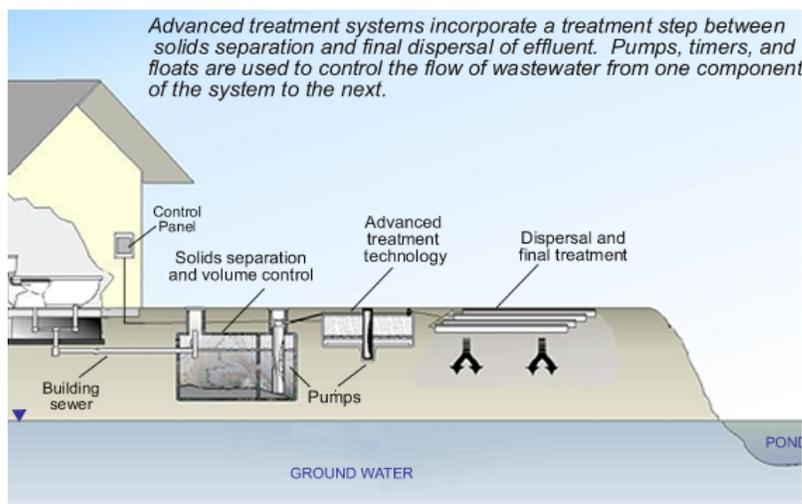


Figure courtesy of University of Rhode Island Onsite Wastewater Resource Center  
[http://www.uri.edu/ce/wq/RESOURCES/wastewater/Onsite\\_Systems/Advanced/index.htm](http://www.uri.edu/ce/wq/RESOURCES/wastewater/Onsite_Systems/Advanced/index.htm)

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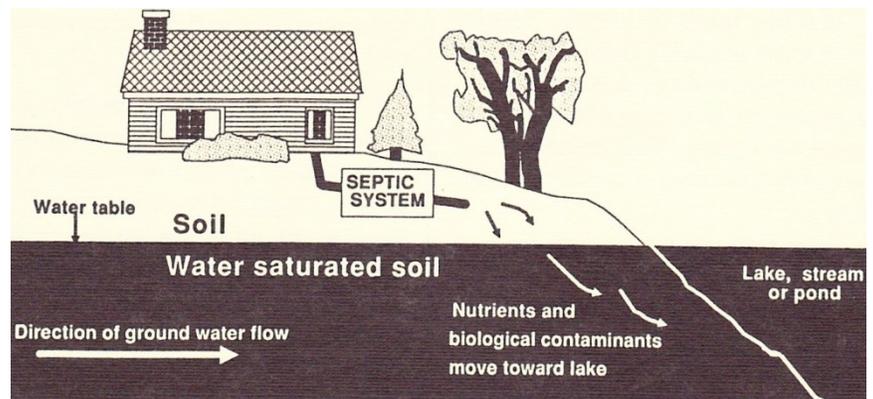
## Your Septic System: Considerations for Shoreline Property Owners

If you live on shoreline property, maintaining your septic system requires more care than maintaining a similar system located elsewhere. 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. Remember that most wastewater treatment happens in the soil of the absorption area. 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.

Water pollution can occur even though your system appears to be working well and complies with local health department codes. The system must be customized to the specific site and may need to employ more advanced treatment technology.

### The Effects of Septic System Wastes on Lakes and Streams

Nutrients (especially phosphorus) from inadequate 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.



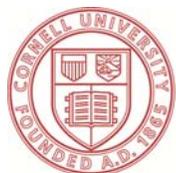
Wastewater from your septic system that reaches adjacent surface waters also increases the chance that wildlife, swimmers, and downstream users are exposed to infectious bacteria and viruses that are associated with wastewater.

### Signs That Contaminants are Reaching the Water

In addition to the symptoms of septic system failure described in the publication *Septic System Failure*, 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.** 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.



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**Water test results indicate the presence of biological contamination.**

These tests may indicate 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 back of the Your Septic System folder).

**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 help to trace problems.

### **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 in other publications in this series, 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 shared maintenance contracts and other 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. 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 publication on Alternative and Advanced On-site Wastewater Treatment Systems 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 experienced contractor, and the manufacturer. Some systems require electric power to operate.

**Consider a waterless toilet.** Incinerating 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.

The original version of this publication was developed by Cornell Cooperative Extension (CCE) via a grant from the NYS Water Resources Institute with funds provided by the NY State Legislature through the Dept. of Agriculture and Markets. The project team included A. Meyer, M. Keith, J. Saumier, and M. Shortlidge of Dutchess, Putnam, Rockland, and Westchester Counties. It was adapted from a Michigan State University Cooperative Extension System bulletin by D. Solomon and E. Dersch. It was revised by A. Galford with input from county and NYS health departments and the CCE Water Resources PWT. This material is based upon work supported by Smith-Lever funds from the National Institute of Food and Agriculture, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Dept. of Agriculture. Printed 01/2013

# Your Septic System: Septic System Failure

A septic system is considered to be “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. The septic system can fail when any part of the system is not operating properly, although it is often the absorption area 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 untreated wastewater. Mosquitoes and flies that spread infectious diseases can breed in areas where wastewater reaches the surface. Household chemicals can be poisonous to humans, pets, and wildlife if they are not treated. There will also be environmental impacts.

Replacing your entire septic system could cost \$5,000-\$15,000 or more. Regular maintenance and protection of your septic system is much less expensive than replacing the drainfield or entire system. USDA offers some low-interest loans to low-income homeowners in rural areas.

## 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 degrade over time. Eventually the soil in the drainfield becomes clogged with organic material. 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. **The most common reasons for early failure are misuse or inadequate maintenance by homeowners.** When a system is not pumped regularly, solids build up in the septic tank, then flow into the drainfield and clog it.

## Symptoms of Septic System Failure

**Slowly draining sinks, bathtubs and toilets.** The drains in your house will empty slowly despite the use of plungers. Dark, foul smelling sewage may back up into drains or toilets. Unpleasant odors around the house may indicate a problem with septic system drainage or with the household plumbing ventilation.

**Surface emergence of wastewater.** Sometimes you will notice spongy or 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 septic 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. On the directory look for potable water testing labs in your county or an adjacent county.

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

See the publication **Considerations for Shoreline Property Owners** for additional symptoms in those settings.



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## 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 back of the Your Septic System folder.

**Fence the septic system area.** If liquid waste seeps to the surface, keep people and pets away.

**Exercise caution in working near an opened septic tank.** Toxic and/or explosive gases may be present.

**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 publication on Water Conservation for tips.

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

**Replace the drainfield or entire system.** This type of work only should be performed by a qualified professional and according to local regulations. Contact your county health department to see what changes require a permit. See the publication Building or Remodeling a Home with a Septic System for tips and design features to include.

**Increase 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.

**Conserve water in your home** on a long-term basis. See the Water Conservation publication for tips.

**If periodically saturated soils are a source 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 professional. The location should also be evaluated by your local health department.

**Incorporate 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 publication on Alternative and Advanced OWTS.

**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 intermediate systems are designed for small communities and some rural areas and can be more cost-effective than a conventional sewage treatment plant.

**Connect to a municipal sewage system, if one is available.** Consider the balance between initial and long-term costs versus reduced worry and lowered maintenance.

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## Your Septic System: Water Conservation

Water conservation has many environmental and economic benefits including reducing demand on surface and groundwater resources and saving energy that goes into water treatment and delivery. If you live in an area serviced by a public drinking water system, water conservation may reduce your bill. If you have a private drinking water well, water conservation can extend its life and may be essential after drought.

Septic system owners who conserve water can help to prevent water pollution, especially after flooding or if your system shows signs of failing. Overloading a septic system reduces its ability to treat wastewater, risking nutrient and bacterial contamination of nearby lakes, streams, and drinking water sources including wells.

A few water conservation tips are presented below. The U.S. EPA WaterSense program has many more ideas and water usage calculators. <http://epa.gov/watersense>

### Water Use Indoors

The first step in understanding how to conserve water in your home is to know where water is used. A family of four uses about 400 gallons per day at home, mostly indoors. Toilets, bathtubs and showers, and washing machines are usually the biggest sources of household wastewater.

**Use water conserving fixtures in repairs and new construction.** See the EPA WaterSense program website for information on certified products.

**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.

**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 settings 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 absorption area to keep up with the volume of effluent.

**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.



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

**Install 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.

**Install sink 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.

**Modify older toilet tanks.** Toilet dams 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.

## **Water Use Outdoors**

Watering lawns and gardens and washing cars account for most of the water used outdoors. Although this water will not go through your septic tank, it is important to protect the absorption area from excess water so that it can properly treat your household wastewater. The other benefits of water conservation also apply.

**Water your lawn and garden only when necessary.** 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. Consider using a drip irrigation system in your garden. 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. Mowing the grass too short can cause roots to die back. The Cornell Turfgrass Program has more information on lawn care <http://www.hort.cornell.edu/turf>

**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.

**Attach a pistol-type sprayer to the end of your garden hose.** It enables you to adjust the flow rate of flow and temporarily shut off the water while you are between tasks.

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