

Figure 2. The soil must be able to both absorb and purify the wastewater if a septic system is to work properly. (Adapted from *Home Sewage Treatment*, by Tyler, E.T., R. Laak, E. McCoy and S.S. Sandu. 1977. ASAE Publication 5-77)

*How does the location of my septic system affect my water supply?*

To avoid problems such as recycling untreated wastewater, location should be the first consideration when installing a septic system. A septic system usually requires 1 acre of land or more and should be at least 100 feet from any wells.

The ability of the soil surrounding the drainfield to absorb and treat the effluent is an important concern in regard to water quality. Signs of soil problems or site limitations that could affect the septic system include gullies, ravines, excessively steep slopes, or other land characteristics that would make installation difficult. The system should not be installed in land that is wet or swampy, designated wetlands, or land near streams or rivers that could flood. It has also been found that septic systems constructed where the water table is too shallow do not provide effective treatment in the drainfield.

Often the most suitable soil for a septic system is on the highest ground on the site. Under ideal conditions, however, the septic system should be located lower than your well, but good soil is most important. Also, the deeper your well, the less likely it is to draw in sewage effluent.

*What are the rules and regulations governing septic systems?*

State law requires a comprehensive soil and site evaluation by your local health department to determine the suitability of your soil and land site. Before construction begins on your home or septic system, you must receive an improvement permit from the health department. Permits for septic systems are valid for no more than five years. Beginning in July 1992, state regulations will require a septic system maintenance contract between homeowners and management organizations for certain types of alternative septic systems.

The size of the septic system that you install is legally determined by the number of bedrooms in your home and the type of soils at the site. Once installation is complete, the system must be approved by the health department before electrical service can be permanently connected to your home.

*What are the alternative types of septic systems?*

The conventional septic system is the most widely used and least expensive. Alternative types of septic systems include low-pressure pipe systems, fill systems and aerobic treatment units. These cost a great deal more to install than a conventional system, and the low-pressure system needs to be inspected every 6 months. The aerobic treatment unit must be inspected 4 times a year.

Other possible options for on-site wastewater disposal include cluster systems, sand filters, mound systems, and spray irrigation systems.

*What interest do banks and mortgage companies have in my water and septic systems?*

Some banks or lenders require that the prospective buyer or seller furnish proof of a bacteria-free water supply before they will issue a mortgage. Also, some will not issue a mortgage for homes with a failing septic system. Thus, it pays to be concerned about your water from well to wash to waste.

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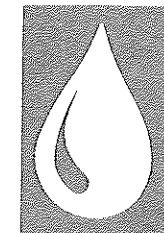


**North Carolina Cooperative Extension Service**  
 NORTH CAROLINA STATE UNIVERSITY  
 COLLEGE OF AGRICULTURE & LIFE SCIENCES

*About...*

# SEPTIC SYSTEMS

*What you need to know*



Water Quality and Waste Management Initiative  
 North Carolina Cooperative Extension Service

# Septic Systems: What you need to know.

## What are the parts of a septic system?

In North Carolina, most septic systems are the conventional type, consisting of a septic tank and a drainfield. The tank, which usually has a capacity of about 1,000 gallons, is buried in the ground along with a number of gravel-filled trenches. Either the front yard or the backyard of a home must be large enough to accommodate the tank and drainfield. Generally, at least 1 acre of land is needed for a properly functioning septic system. The cost of installing a conventional septic system ranges from \$1,000 to \$2,500.

## How does each part of the septic system function? How can I tell if my septic system is not functioning safely or properly?

Household wastewater from the kitchen, bathrooms, and laundry area flow into the septic tank. Solids remain in the tank, and the liquid — called septic tank effluent — flows out of the tank to the drainfield where it leaches through the soil. In a properly functioning septic system, the germs (bacteria and viruses) in the septic tank effluent are removed in the soil treatment zone by filtering and by soil microorganisms before reaching the groundwater. Some chemicals such as nitrates, however, are not typically removed in the soil treatment zone.

Not all soils, however, are capable of absorbing and purifying septic tank effluent. An odor of sewage and a wet area around the drainfield are signs that the septic system is not functioning properly. Also, contaminated well water may be a sign that your septic system is not doing its job. If you suspect a problem with your septic system, call your local health department immediately.

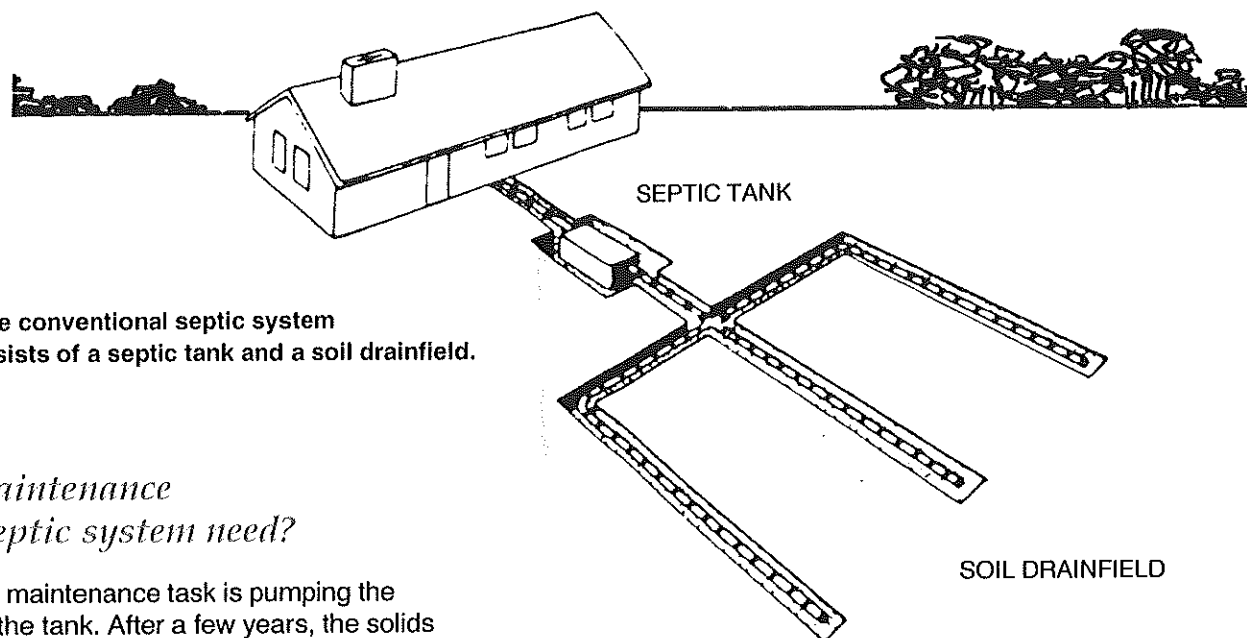


Figure 1. The conventional septic system usually consists of a septic tank and a soil drainfield.

## What maintenance does a septic system need?

The biggest maintenance task is pumping the solids from the tank. After a few years, the solids that accumulate in the tank need to be removed and disposed of properly. If not removed, the solids will spill over into the drainfield and clog the soil. With proper maintenance, a septic system can work efficiently for many years.

These factors determine how often your tank will need to be pumped:

- the size of your tank;
- the volume of your wastewater;
- the amount of solids in your wastewater.

Extension publication AG 439-13, *Septic Systems and Their Maintenance*, gives guidelines for pumping.

Seasonally used systems, such as those of vacation homes and summer cottages, will not need to be pumped as often as year-round residences. The use of a garbage disposal, however, doubles the amount of solids in your system, and your tank will need to be pumped more often. Here are some tips for proper maintenance:

- Limit the use of garbage disposals.
- Do not use too much water. (A good limit is 50 gallons per person per day.)

- Do not add materials such as facial tissues, hygiene products, or cigarette butts to wastewater.
- Do not pour cooking oils or grease down the drain.
- Maintain a grass or other vegetative covering over the drainfield.
- Keep autos and heavy equipment off of the system.

## What should not be flushed through a septic system?

The following substances should not be put in the septic system:

- cooking grease, oils, or fats;
- pesticides;
- paints;
- paint thinners;

- solvents;
- disinfectants; and
- other household chemicals.

Cooking grease, oils or fats should be placed in a container and put in household garbage that will be landfilled. Pesticides, paints, paint thinners, solvents, disinfectants and other household chemicals are toxic substances that threaten ground water quality. They may also kill the microorganisms that help purify the sewage. For information on safe disposal of these chemicals, contact your county office of the N.C. Cooperative Extension Service.

## What is in the effluent from my septic system?

The effluent contains all of the liquid from your wastewater, which often includes bacteria, viruses, chemicals, and other contaminants. The septic tank removes some wastes, but the septic tank effluent may still contain bacteria, viruses, chemicals and other contaminants. The soil drainfield provides further absorption and treatment. If effluent is not treated adequately, its contaminants may threaten ground water quality.

## Can my septic system contaminate my well?

If septic tank effluent flows into an area with a shallow water table, it might not be adequately purified before entering ground water. A similar problem can happen where the soil is too thin over rock to treat the septic tank effluent well. If inadequately treated septic tank effluent enters groundwater, your well water supply and that of others nearby can be contaminated. In this case, you might unintentionally "recycle" this poorly treated septic tank effluent into your home with your drinking water supply. With proper safeguards, recycling of untreated sewage can be greatly reduced or avoided.