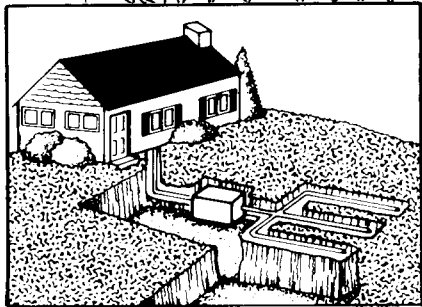
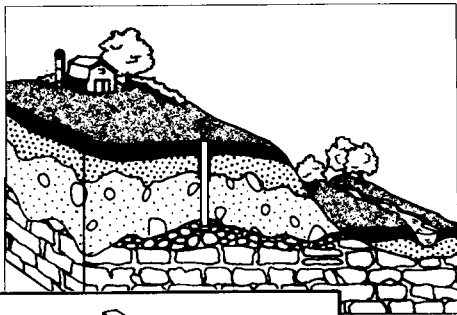


# Soil Facts

## Investigate Before You Invest



*If you are planning to purchase a building lot for a new home, investigate before you invest. If a public sewer system is not available, you may need a septic-tank-soil-treatment system (septic system) to treat and dispose of sewage from the home you plan to build on the land. If a septic system is needed, consider these steps before you purchase land:*

- Determine the types of soils on the lot.*
- Find out what type of septic system, if any, will work on those soils.*
- Obtain a septic system improvement permit (IP) from your local health department*
- Obtain a cost estimate for installing the kind of septic system you need. Ask about the operating requirements and maintenance costs for the system.*

Most homes in rural and outlying suburban areas depend upon an individual septic system for wastewater disposal. This system typically consists of a thousand-gallon-capacity septic tank buried in the ground and a drainfield that can fit within the front yard or backyard of the home-site. Household wastewaters from the kitchen, bathrooms, and laundry area flow into the septic tank where the solids are retained. The liquid flows out of the tank to the drainfield where it leaches through the soil and is purified before reaching the groundwater.

Unfortunately, not all soils can absorb wastewater or purify it. Septic systems that are installed in unsuitable soils usually malfunction by leaking raw, untreated sewage to the soil surface or a roadside ditch, or by contaminating the groundwater. The sewage may contain deadly bacteria and viruses. It can be expensive to remedy the odor problems and potential health hazards that result from the use of septic systems in unsuitable soil. Thus, state law requires a comprehensive soil and site evaluation by the local health department to determine the suitability of the soils and topography of the lot. An improvement permit *must* be obtained from the local health department before construction begins on the home or the septic system.

If you are comparing a number of lots, apply for a permit for each lot. However, if application costs or

time constraints make this impossible, you may wish to preview the lots yourself and eliminate ones with obvious problems. A professional consultant with experience in soils evaluation can provide helpful input for your decision. Then, apply for a permit for those lots that show the greatest potential. The following steps can help you screen the lots and determine their suitability.

### Reviewing the Lot

Before you invest, walk over each lot and look for indications of soil problems or site limitations that could affect the performance of a septic system.

- Are there gullies, ravines, excessively steep slopes, or other topographic problems that would make it difficult to install a system?
- Is the land next to a stream or river that could flood it?
- Does the land seem wet and swampy?
- Does the land contain designated wetlands? Has the extent of any designated wetlands been mapped on the property?
- Are parts of the land rocky? (Bedrock would interfere with the installation and operation of a septic tank system.)
- Is there enough space on the building lot for the home, the septic system, and, if needed, a water-supply well?

Your well and all neighbors' wells should be 100 feet or further from the septic system. There must also be enough land for a "repair area" that can be used if the system needs expansion or repair in the future. One acre of land with *suitable soils* and *suitable topography* is usually the minimum sufficient area. However, much larger lots are frequently needed where soil and site conditions are not as good.

If you do not observe any obvious site problems, you may wish to identify the soil types. Visit your county Extension office or local soil and water conservation district to learn more about the soils in your area. The county soil survey report shows which soils are most likely to occur on the land you are investigating. You can use this report to help screen land parcels and focus your efforts upon those lots that have the most desirable soil and site characteristics. The soil survey report provides very useful planning information; however, it does not provide enough detail to make a decision on land suitability for septic systems. Do not substitute it for an on-site evaluation of soil and site conditions.

Does the soil survey report indicate that most of the soils on your lot are probably suited to the use of septic systems? If so, then a comprehensive on-site investigation must be conducted by the local health department to confirm the suitability of the site. If not, then the likelihood of finding an acceptable site is lessened. Remember, however, that unsuitable soils and suitable soils can occur side by side on the same lot.

## Types of Septic Systems

The kinds of soil and site conditions on the land determine whether the local health department can issue an improvement permit, as well as the type of septic system needed there. The conventional septic system, with a septic tank and a number of trenches buried 2 to 3 feet deep, is used at almost one-half of the homesites with septic systems in North Carolina. It works well in brightly colored (red or brown), thick, loamy-textured soils with deep water tables. This type of system is relatively inexpensive; the average installation cost ranges from \$650 to \$2,000, depending upon the part of the state. On some soils that are too wet or too shallow for a conventional septic system, a modified conventional system or an alternative septic system may be used.

Alternative septic systems include low-pressure pipe (LPP) systems, fill systems, and other specially designed systems. The LPP system may cost twice as much to install as the conventional system and should be inspected every six months. Fill systems may also be quite expensive and difficult to construct. Some other sites may be usable only with a sand-filter spray-irrigation system that can cost \$7,000 to \$10,000 or more to install and can require 5 to 10 acres or more of land area. *There are many soils, however, that are not suitable for any alternative septic system.*

For these reasons, it is in your best interest to determine the suitability of a lot for a specific kind of septic system before purchasing the lot. Apply to the local health depart-

ment for an improvement permit. If you can use a conventional system, ask about any modifications to the system or to the site that may increase the installation cost. Also ask whether the approval affects the number of bedrooms that can be built in the home, or the location of the house, driveway, or a swimming pool. If a conventional system cannot be used, you may wish to determine the installation cost and maintenance costs of the system that can be used. Or you may wish to make the purchase conditional upon the issuance of a permit for a specific type of septic system. Remember, permits for septic systems are valid for no more than five years.

## Further Information

Contact your local health department for more information about the types of septic systems used in your area. Visit or call your county Extension office to obtain Agricultural Extension Service publication, in the AG-439 series, *Land Suitability for Septic-Tank-Soil-Treatment Systems*, which explains how sewage effluent is purified in soils and describes how to evaluate the suitability of soils on your lot. Other publications you may find useful in the AG-439 series include, *Septic-Systems and Their Maintenance* and *Septic System Options for Difficult Sites*. Other information regarding subdivision and land use policies, zoning, deed restrictions, building setbacks and codes, and finances should also be evaluated when considering the purchase of a building lot.

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