



Improving Septic System Maintenance in Coastal Communities

Is the water around you protected from septic systems?

Most people don't really think much about the wastewater created in the home from the kitchen, bathroom, or laundry areas. Out of sight and out of mind is what happens in most cases with septic systems until problems occur. However, failing septic systems are more than a nuisance — they are a health hazard and can cause significant problems in the coastal environment.

Over 50 percent of the coastal residents in North Carolina are on septic tank systems. This includes farms and small communities as well as major resort areas, such as many of North Carolina's barrier island beaches. One of the easiest ways to protect coastal waters from pollution is to check and maintain your septic system. This will also help your investment in your coastal home.

If not properly installed or maintained, septic systems can pollute wells and water resources when they are placed too close to a well or to surface water such as shellfish harvesting waters. The major contaminants from failing septic systems that enter water are disease-causing germs. These invisible germs — such as bacteria and viruses — can cause many human diseases. Fecal coliform is an indicator that there is a problem with warm-blooded human or animal waste (from pets, wild animals, sewage) present in the water. Maintaining a septic tank system is more than pumping the tank after the system has started failing. Instead, it will usually be necessary to install a new drainfield. This can cost quite a lot of money and will result in a major disturbance to your landscape from digging up your yard.

Another potential contaminant that can come from septic systems is nitrogen in the form of nitrate-nitrogen — fertilizers and manure. If the nitrate level of your well water is too high, the water can potentially be hazardous to infants in their first six months of life. Nitrogen in lower levels can also lead to contamination that leads to increased enrichment of nutrients in rivers, streams, or estuaries. This can cause algae blooms and loss of dissolved oxygen, which most plants and animals need in estuarine waters. All of these can also lead to warnings of contaminated water for recreational swimmers as well as closure of shellfish harvesting beds.

It can be expensive to get pollutants out of water once they get there. New wells or treatment systems would be required to get unpolluted water again. Clearly, it is much more effective to keep pollutants out of water than to try to clean up problems afterward.

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What is a septic system?

This document will deal with conventional septic systems, which are the most common types of septic systems. For those with alternative or innovative systems, there may be additional or different measures to follow to keep up your system. However, even if you have an innovative septic system, most of the information in this document will help you maintain the system to protect water resources. Check with your county health department to determine what type of system you have if you do not know and ask what specific guidelines your alternative system needs to be maintained.

A septic system is an efficient, inexpensive, convenient, and safe method for treating and disposing of household wastewater before it is recycled back to the groundwater system. However, the system must be properly installed and maintained. A conventional septic system consists of four main parts:

1. The **source** is where the wastewater is generated.
2. The **septic tank** collects and stores the solids that come from the house.
3. The **drainfield** is made from pipe and gravel that are installed as trenches in the soil. The drainfield delivers wastewater to the soil.
4. The **soil beneath the drainfield** purifies the wastewater before it flows to the underlying groundwater.

Wastewater flows from the house into the septic tank. The solids sink to the bottom of the tank, the grease floats to the top, and the liquid portion of the wastewater flows out into the drainfield. The drainfield distributes the wastewater and allows it to slowly move into the soil. As it moves through the soil, the wastewater is purified by organisms that live in the soil.

State law requires that soils be evaluated by the local health department and that an improvement permit and an authorization to construct an on-site wastewater system (construction authorization) be issued before house construction begins or the septic system is installed. The purpose of this evaluation is to ensure that the soil can both absorb and treat the wastewater from your home. Septic system installation must be approved by the local health department before electrical service can be permanently connected to the home, the home occupied, and the septic system put into use. It is also important to know who your county's health department specialist is for on-site wastewater management (septic tank systems). This person will be able to provide information about the location of your septic

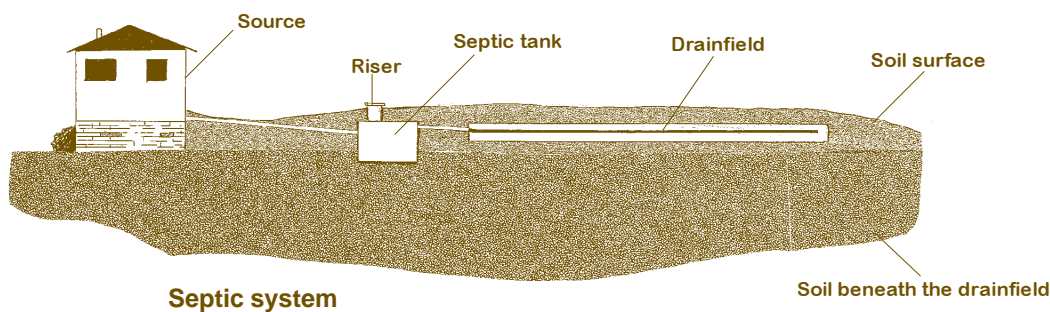
How can this publication help?

The North Carolina Coast*A*Syst program has prepared this publication to help you focus on potential problems with your drinking water and the surrounding water that may be caused by an improperly placed, constructed, or maintained septic system. Read the publication before you begin answering the questions in this publication. After you have read this publication, walk around your property and answer the questions in the margins. Your answers will help you see any potential problems.

Gather any records you have about your septic system: the type of system you have, the location of the septic tank and the drainfield, and the location and type of well on your property. If you do not have records, contact your local health department for a copy of your septic system permit and soil evaluation sheet. Walk around the area near your septic system and look at it closely. Also look at the area around your well.

- If you answer a question either **a** or **b**, you have few problems with your septic system.
- If you answer a question either **c** or **d**, there may be potential problems with the condition of your septic system. Answering **c** or **d** does not necessarily mean there are problems with the system but is a red flag indicating that you should consider making changes to your septic system in order to protect the surrounding water and groundwater.

If you would like further help in assessing the condition of your septic system, please visit your nearest Cooperative Extension Center and talk with your Extension agent.



system and drainfield and about changes in rules. General information on maintenance of your septic system is also available from your county Cooperative Extension Center.

You must receive a series of permits from your local health department before installing or repairing any septic system.

NC Cooperative Extension has septic system demonstration sites for coastal areas in Bolivia (Brunswick County) and Plymouth (Washington County). There are demonstration sites in Raleigh (Wake County) and Greensboro (Guilford County) in the Piedmont and in Fletcher (Henderson County) in the western part of the state. Contact your local extension agent to schedule a visit to learn more about septic systems.

North Carolina Coast*A*Syst Publications

- *Protecting Well Water in Coastal Communities, #1*
- *Improving Storage and Handling of Household Hazardous Waste for Coastal Communities, #2*
- *Improving Septic System Maintenance in Coastal Communities, #3*
- *Improving Lawn Care and Gardening in Coastal North Carolina, #4*
- *Stormwater Management for Coastal Homeowners, #5*
- *Dock and Pier Construction in Coastal Communities, #6*

General Condition Of Your Septic System

Knowing the general conditions of your septic system can give you a better grip on potential maintenance issues for your system. It will also help you keep up to date on the latest state rule changes and how it may affect you and your system. Your local Cooperative Extension Center can help you with the new information from the state as it becomes available.

1. How old is your septic system?

North Carolina rules regarding the placement and design of septic systems are being improved over time. Major changes to the state rules occurred in 1977, 1982, 1992, and 2000. Knowing the age of the system may determine your legal requirements to follow certain rules. Current rules require a comprehensive evaluation of the soil before a septic system can be approved for that location. State rules also require homeowners to employ a trained and state certified subsurface system operator for certain types of more advanced septic systems installed or repaired after 1992. These operators ensure that the system is operating properly. The changes in the rules have improved the chances that your septic system will work better.

If you do not know the age and type of your septic system, this information may be available from your local health department.

2. What is the depth between your drainfield and the groundwater table?

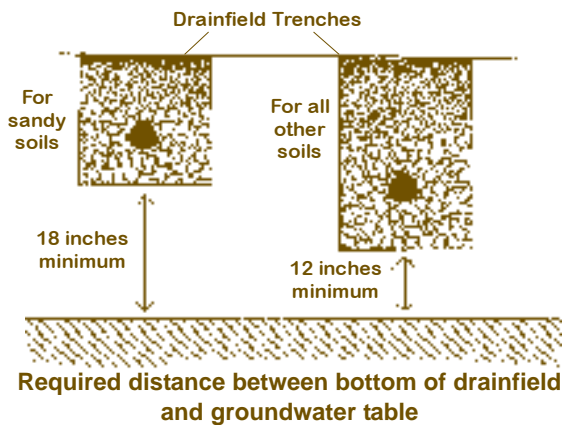
Wastewater moves from the septic tank into the drainfield and then slowly into the soil. The drainfield trenches are normally installed 2-3 feet deep, but in many coastal areas the trenches may be installed shallow and be closer to the ground surface. The wastewater is purified as it moves down through the soil and into the groundwater. The groundwater table is the top of the saturated zone in the

1. **Circle the answer that best describes the age of your septic system.**
 - a. Your septic system was installed after 1992.
 - b. Your septic system was installed between 1982 and 1992.
 - c. Your septic system was installed between 1977 and 1982.
 - d. Your septic system was installed before 1977; OR you do not know.

2. **Circle the answer that best describes the relationship between the location of your septic system and the groundwater.**
 - a. The groundwater always remains at least 4 feet below the surface.
 - b. The groundwater normally remains more than 4 feet below the surface except for very short periods of time (less than a week) during wet times of the year.
 - c. The groundwater normally remains more than 2 feet below the surface except for very short periods of time (less than a week) during wet times of the year.
 - d. The groundwater periodically rises to within 2 feet of the surface; OR you do not know.

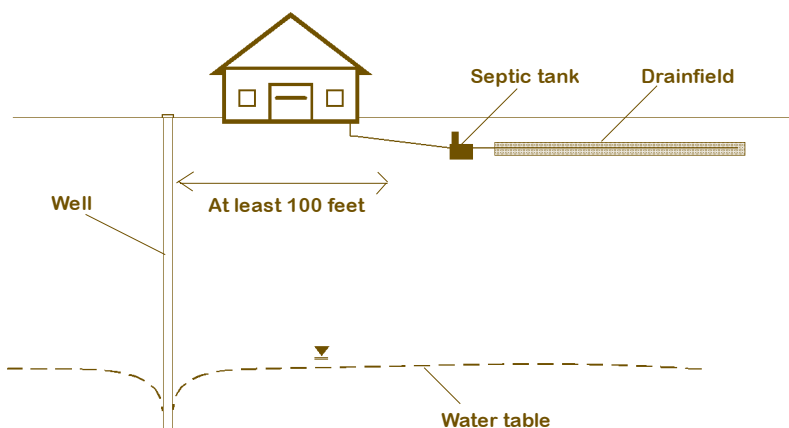
soil closer to the ground surface after it rains or during the wet time of the year, which tends to be in the spring and summer. It can then drop deeper into the soil when the weather is drier.

North Carolina septic rules require that the groundwater table or other soil wetness conditions remain at least 12 to 18 inches deeper than the drainfield trenches, even during the wet time of the year. Soil above the groundwater table is considered to be "aerobic." "Aerobic" means that the soil has some air in it and is not totally saturated (or filled with water). This aerobic soil is where most of the germs from the sewage are removed. The best way to protect drinking water is to maintain as much of these aerobic conditions as possible between the drainfield trenches and the groundwater table, even during the wet times of the year.



3. Where are your septic system and well located?

Once the purified wastewater drains through the soil, it enters the water table and becomes part of the groundwater. One way to help protect your drinking water and other water resources from your septic system is to separate the two. North Carolina law requires that septic systems be placed at least 100 feet away from a well or other water source. Sometimes, however, this separation distance can be reduced to as little as 50 feet due to site planning considerations.



Safe separation distance between septic system and well

For Coastal Rental Homes

When a home is regularly rented on the barrier islands, it may have higher occupancy than typical for the home that is purely residential for family use. Each week, a new group of users is ready to put the system to the test such as washing more to remove sand and saltwater from themselves, their clothes, and their beach gear many times during the day. Hence, the septic system may need to be pumped more frequently or at least it should be checked more frequently. There is also the need to educate the users (who are not the homeowners) who have no vested interest in protecting the longevity of the property or the environment. Strict adherence must be made to the occupancy limits. Bringing in more vacationers than is stated in the occupancy limit will overload the system and cause septic system failure or groundwater pollution. Many renters probably don't even know there is a septic system for the house. Water conservation and proper use of the septic system needs to be emphasized to the renters.

3. Circle the answer that best describes the relationship between the location of your well and your septic system.

- a. Your septic system is downhill from your well or other water source and is more than 100 feet away from it or you are on a public water supply.
- b. Your septic system is uphill from your well or other water source and is more than 100 feet away from it.
- c. Your septic system is 50 to 100 feet away from your well or other water source.
- d. Your septic system is less than 50 feet away from the well or other water source; OR you do not know.

4. What type of soil is your septic system installed in?

Knowing the type of soil in which your septic system is located is important for protecting the groundwater from pollution and will help you understand why certain rules and regulations might apply to you and your septic system. Gently sloping, deep soils that aren't too clayey or too sandy with a deep groundwater table make the best sites. If the soil is too sandy, wastewater can flow through the soil into the groundwater too fast and is not purified. An authorized agent such as the county environmental health specialist is the one to determine what type of soil best suits the placement of your septic system.

If the groundwater table is too high in the soil, it can cause sewage to back up into the home during wet times or can result in contamination of the groundwater by pollutants from the septic system. Avoid areas that have the groundwater too close to the surface, very sticky clays, or soil layers that restrict the downward flow. Any of these conditions can keep water from flowing through the soil and cause untreated sewage to collect on the ground surface, where it can flow over to your water source or cause sewage to back up into your home. In coastal areas, there is often little elevation difference between the home plumbing and the drainfield. This can also affect the downward flow.

The soil should be uniform, brown, brownish-red, or bright orange in color and should not have spots of gray. Gray spots indicate that the soil may be too wet to contain enough air (anaerobic conditions) during the winter and spring and that the groundwater table may be too close to the ground surface.

5. Are trees and shrubs planted near your septic system?

Trees or shrubs located closer than 100 feet to septic systems may cause problems. Roots from plants sometimes enter the septic tank drainfield, the tank, or the pipes, preventing the proper working of the septic system. Do not plant water-loving trees or shrubs near the septic system. Failing septic systems increase the likelihood of groundwater or surface water pollution and are a hazard to human health.

6. Are your drainage ditches maintained?

For septic systems that use ditches or subsurface drain tiles to drain excess water from the soil, it is important that the outlets from these ditches be inspected regularly and cleaned as needed. If the outlet becomes plugged up, water can no longer drain from the soil into the ditch. The soil will stay too wet for the drainfield to work properly and your septic system may fail or sewage may back up into your home. In many coastal communities, these drainage networks extend throughout entire subdivisions and may be maintained by the homeowners association or the county. Also in some areas, the

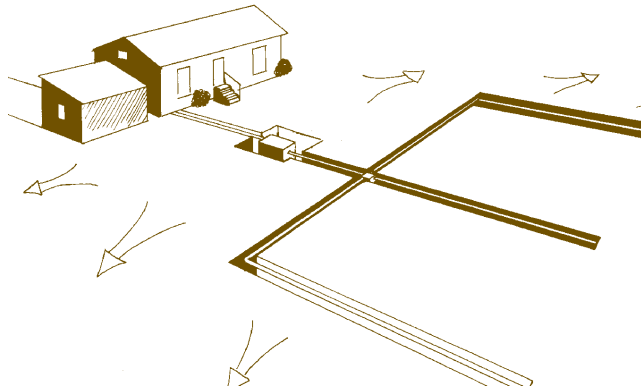
4. Circle the answer that best describes the type of soil and conditions in which your septic system drainfield is buried.
- a. Your septic system is installed in deep, well-drained soil (not too clayey, not too sandy) to allow full absorption and treatment of wastewater or you have a low-pressure pipe system installed in sandy soil or a pretreatment system installed in any soil.
 - b. Your septic system drainfield is installed in deep red, clayey soil that drains reasonably well. If your soil is clayey, a handful of it easily breaks into small pieces when moist.
 - c. Your septic system drainfield is installed in sandy soil with a shallow groundwater and does not have a low pressure or pretreatment system.
 - d. Your septic system drainfield is installed in thin soil with very sticky clay soils or soil layers that restrict downward flow of water; and the system does not include a pretreatment system, such as a sand filter; OR you do not know.



Trees should not be located too close to septic system

5. Circle the answer that best describes the location between your trees and your septic system.
- a. No trees are within 100 feet of your septic drainfield. You've never had a problem with roots in the drainfield, pipes, or tank.
 - b. No trees are within 50 feet of your drainfield.
 - c. The only trees within 50 feet of your septic drainfield are trees that grow poorly under wet conditions (most oaks, dogwoods).
 - d. Trees or shrubs within 50 feet of your drainfield that grow well under wet conditions (willows, willow oaks, some maples) or you've removed roots from drainfield lines at least once and make no effort to prevent root regrowth; OR you do not know.

drainage network may have a “pumped outlet” that must be periodically inspected and remain operational throughout the wet time of year.



Runoff draining away from the septic system

6. If you use drainage ditches, circle the answer that best describes how you maintain your drainage ditches.

- a. Your drainage ditches and outlets are maintained on your property and on surrounding properties.
- b. Your drainage ditches are well maintained on your property but not on surrounding properties.
- c. Your drainage ditch still exists but is beginning to become filled with soil or with trees, or brush growing in it or your drainage outlet is partially covered by water, soil, or debris.
- d. The outlet of your drainage ditch is blocked or your drainage ditches have filled in and water is not flowing freely through them; OR you do not know.

Maintenance of Your Septic System

7. How much water do you use?

As with city sewers, there are limits to the amount of water septic systems can treat. However, if you have a city sewer and use too much water, a problem occurs far away at the city sewage treatment plant. If you have a septic system and use too much water, your wastewater may backup into your yard or house, since your septic system serves as your sewage treatment plant.

The soil drainfield is designed for no more than 120 gallons per bedroom per day. Most people use about 50 gallons per day of water. Therefore, a family of four will typically use about 200 gallons per day of water. The soil and the drainfield may not be able to handle the volume of wastewater produced in your home if your family uses more than 50 gallons a day per person. When the amount of water entering the septic system nears design capacity, your septic system may fail.

Problems caused by using too much water can occur throughout the year, seasonally, or day to day during the week. For example, the soil beneath your drainfield cannot absorb as much water in the spring, when the soil is naturally more moist, as it can absorb in the summer when the soil is drier. If you wash all your laundry in one day, you may have a temporary problem caused by overloading the soil during that day and not have a problem during the rest of the week.

Reduce your water use by doing the following:

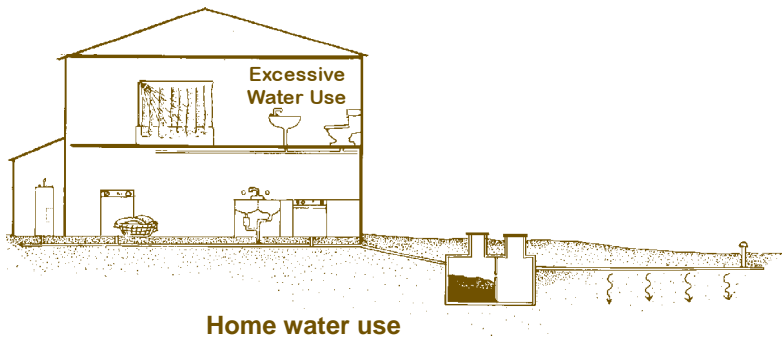
- Periodically check the toilets and faucets to make sure that they are not leaking; fix immediately if they are leaking.
- Use 1.6 gallon (or less) per flush toilets.

7. Circle the answer that best describes the total amount of water you use in your house per day.

- *Note: even if you have a well, you can have a water meter installed to measure your family's water use, or you may contact your local Cooperative Extension Center to get help estimating your family's water use.
- a. You use less than 35 gallons per person per day.
 - b. You use between 35 and 50 gallons per person per day.
 - c. You use between 50 and 60 gallons per person per day.
 - d. You use more than 60 gallons per person per day, you have an in-home day care center or you take in wash for others, or your toilets or faucets have water leaks; OR you do not know.

- Use faucet aerators at sinks and flow reducer nozzles at showers.
- Limit the length of your shower to 10 minutes or less.
- Do not fill the bathtub with more than 6 inches of water.
- Do not wash more than 1-2 loads of laundry per day.
- Adjust the water load control on the washing machine so that it matches the size of the load you are washing.
- Do not run the dishwasher until it is full.
- Do not overuse large garden tubs, Jacuzzis, or other high volume tubs.

Your Cooperative Extension agent will have more information on how to reduce your water use.



8. Do you use a garbage disposal?

To reduce the possibility of septic system failure, restrict the use of the garbage disposal unit. Put most of your table scraps into the trash rather than down the drain. Garbage disposals usually double the amount of solids added to your septic tank and can cause poor performance of the drainfield. If you use a garbage disposal, you should increase the frequency of having the tank pumped due to the buildup of solids.

9. Do you pour cooking grease or oil down your sink?

Do not pour grease, creams, butter, cheeses, or cooking oils down the sink drain. Grease can harden in the septic tank and/or drainfield or clog the soil so that no water can flow through the soil. If this happens you will need to install a new drainfield — a very expensive result that also causes damage to your yard's landscaping.

10. Do you use cleaning products?

Use moderate amounts of cleaning products and do not pour solvents or other chemicals down the drain. Do not dispose of extra cleaning products or pain products by pouring them down the drain. Do not use toilet cleaners that are meant to be placed in the toilet tank. Such chemicals can kill the good bacteria in your septic tank and in the soil beneath your drainfield. Nail polish remover and nail polish should not be poured down the drain either.

8. Circle the answer that best describes your garbage disposal.

- a. No garbage disposal.
- b. Have a garbage disposal but put most of the table scraps in the trash, and also have a separate tank that treats garbage disposal waste before it goes into the septic tank.
- c. Limited use of garbage disposal (3 times per week) but no separate tank.
- d. Daily use of garbage disposal and no separate tank; OR you do not know.

9. Circle the answer that best describes how you dispose of your grease and oil.

- a. No disposal of grease and oil down the drain, and oil and grease wiped from cooking items with a paper towel before washing.
- b. Limited rinsing of grease and oil while cleaning cooking items during special occasions (holidays, or when entertaining).
- c. Routine rinsing of grease and oil down the drain when washing cooking items.
- d. Routine pouring of grease and oil down the drain from cooking pans, fryers, etc.;

10. Circle the answer that best describes your use of household cleaning products and how you dispose of solvents and poisons.

- a. Minimal use of household chemicals (only 2 cups per week). No disposal of harmful chemicals such as solvents, paints, thinners, disinfectants, pesticides, poisons, and other substances that can kill the bacteria in the tank and soil.
- b. Careful use of household chemicals only when needed to unclog pipes, clean fixtures, etc.
- c. Daily use of household chemicals, such as degreasers, pipe deloggers or toilet bowl sanitizers.
- d. Excessive amounts of cleaning agents, including bleach, poured down the drain or periodic disposal of solvents and other substances such as paints, paint thinners, poisons that can kill the bacteria in the tank and soil or pollute the groundwater; OR you do not know.



DO NOT FLUSH

coffee grounds	condoms	hazardous chemicals, such as:
dental floss	paper towels	paints
disposable diapers	facial tissues	varnishes
cat litter	plastics	thinners
pet wastes	heavy cream	waste oils
sanitary napkins	cheese	photographic solutions
tampons	butter	pesticides
cigarette butts		medicines



11. Do you pour or flush solid waste materials?

Do not put items down the drain that may build up the solids level in the septic tank or clog the septic tank or other parts of the system. These items include cigarette butts, sanitary napkins, tampons, condoms, disposable diapers, paper towels, cat litter, egg shells, and coffee grounds. Do not use your toilet for disposal of facial tissues. This adds extra solids and water to the septic system.

12. Does all your wastewater drain into your septic system?

Make sure that all wastewater produced in the house is directed into the septic system. This includes not only the wastewater from the kitchen sink and the toilets, but also wastewater from tubs, showers, and laundry facilities.

In some older homes in coastal areas, the “grey water” from the washing machine, or even from sinks and tubs, does not go to the septic system but it is discharged directly to a nearby ditch, river, or swamp by a separate pipe. This grey water is still wastewater, with potential pathogens and excess nutrients. This practice, “grey water straight pipe” is no longer legal in North Carolina and can cause substantial contamination of streams, creeks, estuaries as well as affect shellfish, fishing, and recreational waters and presents a significant human health hazard. Check around your property to see if there is a possible straight pipe that bypasses the septic tank system for these types of wastewater.

11. Circle the answer that best describes how you dispose of solid products.

- You never use your septic system as a trash can for any solid products such as cigarette butts, tissues, sanitary napkins, tampons, condoms, cotton swabs, cat litter, coffee grounds, or disposable diapers.
- You occasionally (once or twice yearly) use your septic system as a trash can for cigarette butts, tissues, sanitary napkins, tampons, condoms, cotton swabs, cat litter, coffee grounds, or disposable diapers.
- You use your septic system every month as a trash can for cigarette butts, tissues, sanitary napkins, tampons, condoms, cotton swabs, cat litter, coffee grounds, or disposable diapers.
- You use your septic system every week as a trash can for cigarette butts, tissues, sanitary napkins, tampons, condoms, cotton swabs, cat litter, coffee grounds, or disposable diapers; OR you do not know.



12. Circle the answer that best describes how you dispose of wastewater.

- All of your wastewater is disposed of in an approved septic system.
- All of your wastewater is disposed of in a septic system that was installed before state regulations went into effect but seems to be working okay.
- Some of your wastewater, such as wash water or kitchen wastewater, goes to a separate pipe that discharges into a ditch or dry well or in the woods.
- All of your wastewater goes to a pipe that discharges into a ditch or dry well or in the woods; OR you do not know.

13. Have you protected your septic system from physical damage?

Protecting your tank and drainfield from physical damage is an important part of the proper operation and maintenance of your septic system. To protect your septic system from physical damage:

- Keep the soil over the drainfield covered with grass to prevent soil erosion.
- Be careful not to mow the lateral turn-ups if you have a special type of septic system called a “low-pressure pipe system.”
- Don’t drive or park cars or trucks over the system.
- Maintain the natural shape of the land immediately downslope of the system. Protect this area from cutting and filling.
- Locate the septic system prior to underground telephone or cable installation.

14. Does runoff drain away from your septic system?

To reduce water that flows through the soil where the drainfield is buried, keep the water that runs off your foundation drains, gutters, driveway, and other paved areas away from the drainfield of your septic system. Drains from Florida heat pumps and water softeners must not be plumbed into the septic system. Irrigation systems should not be installed in or drain directly toward the septic system.

Careful landscaping can help direct excess surface water away from your septic system. Of particular importance in flat, coastal landscapes is the landscaping of the lot to promote runoff of rain-water away from the septic tank and drainfield. This landscaping must be carefully accomplished to avoid damaging the septic system during the landscaping process. Even surface water damage from rain falling and pooling on the top of the drainfield is critical in many flat coastal landscapes.

Mounding over the drainfield area at about 6-12 inches higher in the center of the drainfield and feathered out to the edges so water runs off will help the water run off and not accumulate on the drainfield. The minimum cover normally required over the gravel aggregate for a conventional system is 6 inches. So one would probably have 12-18 inches of cover over the center of the drainfield area reducing to 6-12 inches of cover at the edges on a flat coastal site.

Be careful not to just mound over the individual drainfield trenches and leave depressions between them. That just captures rainwater and keeps it in the drainfield area on a flat lot. More soil must be put over the trenches when they are first covered once the system is approved for final cover by the health department. After the first couple soaking rains, the fill placed back into the trenches (on the gravel) will settle and result in linear depressions over the trenches. This will capture water when it rains and inundating the drainfield with extra water. Make sure to NEVER drive over the drainfield.

13. Circle the answer that best describes vehicular traffic over the septic system.

- a. No vehicles or equipment are ever driven over your septic tank or drainfield, except lawnmowers.
- b. You have carefully (once or twice) driven a car over your drainfield, but don't cross it with heavy equipment and have never driven over the tank or pipe network.
- c. You have periodically driven vehicles over your drainfield, but don't ever cross it with heavy equipment.
- d. You have driven over your septic tank or pipe network with vehicles or over any part of the system with heavy equipment, trucks, etc.; OR you do not know.



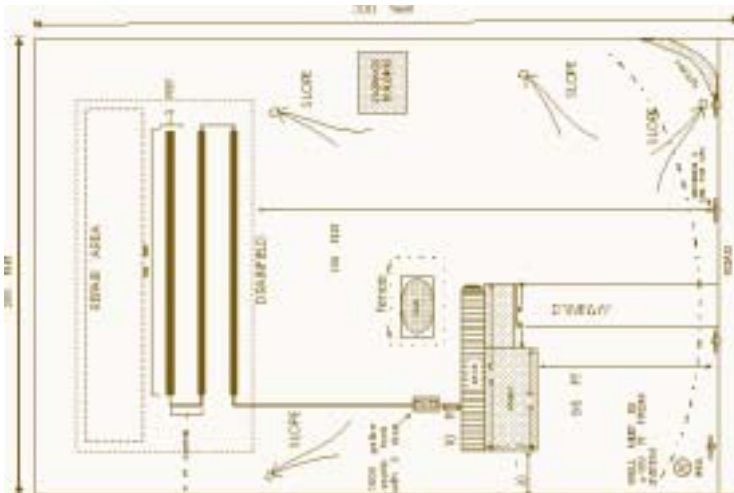
14. Circle the answer that best describes how surface water flows in your yard.

- a. You have landscaped the yard to divert rain water and water from your roof, gutters, and foundation drains away from the septic system.
- b. You have landscaped the yard to divert rain water away from your septic system. You're not sure where the roof, gutters, and foundation waters drain.
- c. You have landscaped the yard to divert rain water away from your septic system. Your roof, gutters, and foundation drain across your septic system.
- d. Water from the roof, gutters, foundation, driveway, and yard drains over your septic system; OR you do not know.

15. Have you built over your drainfield?

Do not cover the tank or drainfield with asphalt or concrete. Do not build any additions to your house, install an above- or below-ground swimming pool, or put a driveway over the drainfield. Before any construction in the area adjacent to the drainfield, first check with your local health department. For proper function and maintenance, your entire septic system must be accessible. Air must be able to get into the soil so that the proper sewage treatment occurs. Use a property layout sketch to help you place new structures on your property away from the septic system.

All lots also have a separate “replacement area” identified by the county health department for expanding the septic system or replacing it if needed. This area was evaluated at the initial site evaluation. It is critical that this area be protected as it may be the only area on the lot with acceptable soil conditions for system expansion or replacement. Check with your local county health department to identify this area on your lot.



Property layout sketch of the septic system

16. What safety precautions do you take around your septic system?

Some simple precautions should be taken to ensure the safety of you and your family around the septic system.

- You should learn more about septic system safety before ever opening the lid to your septic system or trying to inspect it.
- Sewage in septic systems may contain germs that can cause disease. To prevent the spread of diseases, you should wash up after checking your septic system. If untreated sewage comes to the ground surface, you should contact your local health department to get a permit to repair your system.
- Be sure to avoid spark and shock hazards on systems with pumps or electrical controls, because sometimes there are toxic or explosive gases in septic systems that can be ignited.

15. Circle the answer that best describes the placement of additions onto your house.

- a. No additions to your home or construction of outbuildings, swimming pools, or driveways have been made since your septic system was installed.
- b. Additions to your home or construction of outbuildings, swimming pools, or driveways have not started until your local health department has been contacted.
- c. You have not contacted your local health department, but have a copy of your septic system permit and are sure that additions to your home or construction of outbuildings, swimming pools, or driveways have been located away from the septic system and repair area.
- d. An addition to your home, a swimming pool, or a driveway has been built over the septic system or repair area; OR you do not know.

WARNING

Do not open or inspect your septic tank on your own. Toxic gases that can kill in minutes are produced in septic tanks. Septic tanks should always be inspected by a trained on-site wastewater professional.

16. Circle the answer that best describes your work habits around the septic system.

- a. You have received proper training and you wash up after checking your system. You never enter your septic tank. You secure the septic tank lid so that children cannot open it. You use caution to avoid shock and spark hazards on systems with pumps or electrical controls.
- b. Not applicable
- c. Not applicable
- d. You don't wash up after checking your system. You enter your septic tank. You don't secure the septic tank lid so that children can not open it. You are not cautious with the electrical parts of your septic system; OR you do not know.

- The septic tank lid should be locked or tightly in place at all times to prevent children from opening the lid. Pest and wildlife must be prevented from entering or falling in the tank.
- The lid must also be tight in order to prevent mosquitos from breeding in the tank, as well as flies and other vectors transporting diseases from the sewage.

17. Has your septic tank been pumped recently?

After a few years, the solids and greases that collect in your septic tank should be pumped out by a professional septic tank pumper and disposed of at an approved location. If not removed, these solids will eventually block the soil in your system and cause sewage to back up into your home or come to the ground surface in your yard. If this happens, it is too late to solve the problem by pumping your tank and you will have to build a new drainfield on a different part of your lot.

Make sure the certified pumper pumps **both components** of the tank to ensure it is pumped properly. If your system was installed in the last 20-25 years, you probably have two components. The solids, fats, and oil need to be removed from both components. Also, make sure the lid is not cracked and is resealed properly.

How often your septic tank needs to be pumped depends on three things:

- The size of your tank
- The amount of wastewater you produce
- The solids content of your wastewater

Your local health department should be able to tell you the size of your tank. Then, using the table below, determine how often your tank should be pumped. For example, if there are 4 people living in your house and your septic tank can hold 1,000 gallons, the tank should be inspected and pumped at least every three years to see if it needs to be pumped. If you dispose of a lot of solids (toilet paper, facial tissues, plate scrapings, garbage disposal, etc.) into your septic system, then you will want to have the tank inspected more often than illustrated in the following table.

Tank Size (gallons)	Number of People Using the System				
	1	2	4	6	8
	Number of Years				
900	11	5	2	1	<1
1,000	12	6	3	2	1
1,250	16	8	3	2	1
1,500	19	9	4	3	2

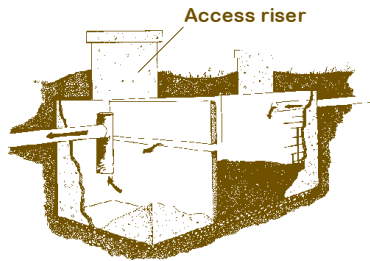
Source: Adapted from "Estimated Septic Tank Pumping Frequency," by Karen Mancl. 1984. *Journal of Environmental Engineering*. Volume 110.



17. Circle the answer that best describes how often your septic tank is pumped.
- You have your septic tank inspected and pumped as scheduled in Table 1.
 - You have septic tank scum and sludge levels checked each year and your septic tank pumped out as needed.
 - You have scum and sludge levels checked and your tank pumped out about once every 5-10 years.
 - It has been more than 5-10 years since you've had your septic tank checked and pumped out or you've never pumped out your septic tank, or you don't know if it has ever been pumped out; OR you do not know.

18. Do you have easy access to your septic system?

It is important to know the location of your septic system. It is also important for professional inspectors and installers to be able to check your septic system. Easy access to your septic system through an access riser and filter allows it to be inspected and cleaned. This diagram illustrates an access riser. These risers can be added by a professional septic system installer even after the system has been constructed.



Access riser installed on a septic tank in a two-component septic system

19. Does your septic tank have an outlet filter?

Rule changes in 1999 required the use of septic tank outlet filters on new septic systems. These outlet filters are installed on the outlet end of the septic tank in the place of the sanitary tee. Outlet filters are designed to hold solids back from flowing out into the drainfield where they can clog the soil. Even if not required by the county health department for your system, you should consider adding an effluent filter to improve the performance of your septic tank and protect your investment in your home. The internal parts of outlet filters must be periodically cleaned by a certified professional or sewage could back up into the home. Contact a professional on-site wastewater system installer or your county extension office for more information.

20. Is your septic system professionally inspected and maintained?

Hire a state certified subsurface system operator when you have a system that uses a pump or other advanced technology including the following:

- Low-pressure pipe system
- Pump-to-conventional system
- Pressure manifold system
- Mechanical aerobic treatment unit (ATU)
- Peat filter
- Sand filter
- Textile filter
- Drip irrigation system

18. Circle the answer that best describes your access to your septic tank.

- a. You have a concrete riser or manhole over your septic tank that provides easy access to the tank.
- b. You do not have a concrete riser, but the location of your tank is marked and the tank is less than six inches deep.
- c. You do not have a concrete riser, but the location of your tank is marked. The top of your tank is more than six inches deep.
- d. You do not know where your tank is located; OR you do not know.



19. Circle the answer that best describes your septic system's effluent filter.

- a. You have a new septic tank system that does have an outlet filter.
- b. You plan to add an outlet filter to your septic tank system that is already in place.
- c. You do not plan to add an outlet filter to your existing septic system.
- d. You do not know if you have an outlet filter OR you do not know.



20. Circle the answer that best describes how you use a certified subsurface system operator if you have one of these four special types of septic systems: a pump-to-conventional, pressure manifold, low-pressure pipe system, or ATU system.

- a. You have hired a certified subsurface system operator if you have a pump-to-conventional, pressure manifold, or low-pressure pipe system.
- b. Not Applicable
- c. Not Applicable
- d. You have not hired a certified subsurface system operator to help operate and maintain your pump-to-conventional, pressure manifold, low-pressure pipe system, or ATU system; OR you do not know.

This operator will check the overall performance of your system and the operation of the pump, electrical controls, and alarm on a regular basis. Hiring a state certified subsurface system operator is required and can provide you with professional care for your septic system.

You are required by state law to hire a certified subsurface system operator if you have a low-pressure pipe system that was installed or repaired after July 1, 1992, or if you have an aerobic treatment unit (ATU), peat filter system, sand filter pre-treatment system, textile filter, or drip irrigation system. As new types of systems are allowed into use in the state, these new systems may be required to be checked by a certified subsurface operator. Many coastal counties in the northeastern part of the state have a professional management entity program provided through the local health department. Septic systems such as sand-lined trench and sand backfill systems are inspected yearly and drainage networks in subdivisions and homesites are professionally operated. You might want to consider contacting your local health department about being part of this professional inspection and management program.

21. Have you talked to a certified subsurface system operator?

Hiring a certified operator to inspect your system is important. Regardless of the type of on-site system used for your home, it is also important to talk to a certified operator, your local health department, or your local management program to find out what you should do to maintain your septic system between visits. To find a certified subsurface system operator, call the Technical Certification Unit at the Division of Water Quality, North Carolina Department of Environmental and Natural Resources (919-733-0026).

- 21. Circle the answer that best describes how you obtain information from your certified operator about your septic system if you have a pump system.**
- a. You find out from your operator what you should be doing between visits to help the system work properly.
 - b. You do not discuss your system with your certified operator but do let him/her know immediately if the alarm is activated.
 - c. You turn off the alarm when it is activated, hope the problem goes away until the next scheduled visit by your certified operator.
 - d. You have a pump system, but have not hired a certified operator to help you manage the system; OR you do not know.

For more information:

You must receive a permit from your local health department before installing, repairing, or expanding any septic system.

Your county health department is a valuable source of information on the following topics:

- Site selection and construction of septic systems
- Septic system inspection and maintenance
- List of registered septic system installers
- Construction records for existing septic systems
- Information on systems that legally require a certified subsurface system operator
- List of state certified subsurface system operators in your area

Your local Cooperative Extension Center will have information on septic tank systems and their maintenance.

Related publications from Cooperative Extension:

- *Septic System Owner's Guide*, AG-439-22
<http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-22/>
- *Soil Facts: Septic Systems and Their Maintenance*, AG-439-13
<http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-13/index.htm>
- *Soil Facts: Investigate Before You Invest*, AG-439-12
<http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-12/index.htm>
- *Soil Facts: Management of Single Family and Small Community Wastewater Treatment and Disposal Systems*, AG-439-11
<http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-11/index.htm>
- *Soil Facts: Septic Systems and the Environment*, AG-439-41

Cooperative Extension also offers professional training courses on topics such as wells and septic tank systems that homeowners are welcome to attend. The courses can be found online at:

- <http://www.soil.ncsu.edu/extension/training/index.php> or
- <http://www.soil.ncsu.edu>

The following publication is available for a small fee from the North Carolina Department of Environment, Health and Natural Resources, Division of Environmental Health (919-733-2895):

- *On-Site Wastewater Management Guidance Manual*, 1996.

These publications are available at your county Cooperative Extension Center. You may also order these publications from Communication Services, Campus Box 7603, North Carolina State University, Raleigh, NC 27695-7603 at <http://www5.bae.ncsu.edu/programs/extension/publicat/wqwm/septic.html>

Other free septic system information is available on request from the Division of Environmental Health, On-Site Wastewater Section (919-733-2895), or go online to:

- <http://www.deh.enr.state.nc.us/>
- <http://www.deh.enr.state.nc.us/oww>
- <http://www.deh.enr.state.nc.us/oww/nonpointsource/NPS.htm>

The help line for the Division of Environmental Health, On-site Wastewater Section, can assist you as well: 1-800-SEWAGE (1-800-426-4791)

For a list of certified subsurface operators, look online at:

- <http://www.deh.enr.state.nc.us/oww/Inspecti/inspect.htm>
- or contact your local health department.

For a listing of the local health departments and their on-site wastewater treatment program, check your phone book or go online to:

- <http://www.deh.enr.state.nc.us/ehs/ehs.htm>
Look under Environmental Health Directory in your county for the On-site Wastewater Coordinator.

*What is the North Carolina Coast*A*Syst Program?*

The North Carolina Coast*A*Syst program is a series of publications that can help you in becoming a good coastal environmental steward and protect the health and well-being of your family. This publication leads you through an evaluation of your home and property to determine the pollution and health risks of your septic system practices. It also provides information on solving potential problems that you may identify. The publications also list the North Carolina state agencies responsible for helping you solve your particular problems.

This Coast*A*Syst program is modeled after the South Carolina Coast*A*Syst program. South Carolina was the first state to develop such a program.

The goal of the North Carolina Coast*A*Syst program is to help protect the health of you and your family and the coastal environment of North Carolina.



North Carolina's modification of Coast*A*Syst was coordinated by Deanna L. Osmond. Mike Hoover, David Lindbo, and Diana Rashash were the technical reviewers at North Carolina State University. Technical review was also provided by Barbara Grimes, North Carolina Department of Environment and Natural Resources, Division of Environmental Health, On-Site Wastewater Section.

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