



Assessing Your Septic System

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The goal of this *Farm•A•Syst* factsheet is to help you protect and improve the groundwater that supplies your drinking water as well as the ponds, lakes, rivers, and streams that make Tennessee beautiful.

The following questions are designed to help you pinpoint potential problem areas on your farmstead. These problem areas may contribute to the contamination of your drinking water if they are not managed properly.

If your answer to any of these questions is *YES*, or if you don't know the answer, you may have a high-risk situation in your home or on your farmstead. Refer to the fact section with the same number as that question (under the heading, "What you should know about . . .") for more information.

Don't be alarmed if you answer *YES* to many or even all of these questions. That does not automatically mean you have a water-quality problem. It may,

YES NO

- | | | |
|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Do you have only a vague understanding of how your septic system works? |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Is your septic system less than 50 feet from your well? |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Have you had problems with roots plugging your septic lines? |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Is the soil under your septic lines either coarse-textured or a fine clay that absorbs water poorly? |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Has it been more than six years since the septic tank was pumped? |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Do you drive vehicles or heavy farm equipment over the system? |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Are you unconcerned about conserving water? |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Do you use your septic system to dispose of trash like paper towels and disposable diapers? |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Do you use a garbage disposal every day or regularly put kitchen wastes down the drain? |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Do you use your septic system to dispose of chemicals like paints, solvents, pesticides, or similar products? |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Do you ever notice wet spots, standing water, or sewage smells near the system, or has your system ever backed up into the house? |

however, tell you that change is needed to avoid potential problems. In the same way, answering *NO* to every question does not mean you are *not* at risk.

Why should you care?

Groundwater is the underground water that supplies wells and springs and recharges surface water bodies. It is the source of drinking water for many Tennesseans. Up to 20 million gallons of groundwater may be stored under the typical farmstead—stored within 100 feet below fertilizer and pesticide storage areas, fuel tanks, livestock pens, and septic systems, all potentially major sources of pollution. The management decisions you make on your farmstead can significantly affect the quality of your drinking water and your family’s health. These decisions can also affect your potential legal liability and the value of your property.

Surface water includes bodies such as ponds, lakes, rivers, and streams. Besides their aesthetic and recreational value, they are often an important source of drinking water for livestock.

Many homes in Tennessee use some type of septic system to treat household wastewater. These systems are generally economical and effective. However, your septic system must be correctly designed, installed, and maintained to reduce the possibility of contaminating surface and groundwater.

Potential contaminants in household wastewater include bacteria, viruses, household chemicals, and nitrate. If any of these contaminants enters surface or groundwater, it could create health problems for you and your family, your livestock and pets, or your neighbors.

Proper operation and maintenance of your septic system can have a significant impact on how well it works and how long it lasts. Maintenance saves you money in the long run; failing systems are expensive to repair or replace compared to the cost of pumping the tank.

The amount of water entering your septic system is also an environmental concern. Excess water reduces the efficiency of the system and can shorten its life.

Water quality is least likely to be affected by your

septic system if you use as many low-risk practices as you can.

Farm•A•Syst is only for your own use and benefit. It is a voluntary program intended to provide general information about protecting and improving water quality. Information from a *Farm•A•Syst* assessment will not be collected by Extension or any other outside agency and should remain in your private records.

What you should know about . . .

1. Septic system operation

Septic systems are used to treat and dispose of wastewater from the home. A properly installed and maintained system will function for many years and minimizes the potential for both surface and groundwater contamination. A poorly constructed or maintained system can fail and return contaminated water to surface or groundwater. Good maintenance can save you money. If your system fails, your only options are expensive ones.

A septic system typically has two parts: a **septic tank** and a **drainfield**.

Wastewater flows from the house into the septic tank. The heavier solids settle to the bottom and form a layer of **sludge**. The light solids and grease float to the top and form a layer of **scum**.

Bacteria break down the solids into liquids. The bacteria cannot completely break down all the sludge and scum, and so solids accumulate in the tank over time. This is why septic tanks need to be pumped periodically. The liquid flows through an outlet into the drainfield as more wastewater enters the tank from the house.

The drainfield is usually a series of parallel trenches containing perforated pipes in a bed of gravel or rock. Wastewater trickles out the holes, through the gravel, and into the soil.

The soil filters out remaining solids. Bacteria, natural chemical processes, and other organisms in the soil help break down the waste. If the soil is deep enough and the movement slow enough, the solids, microorganisms, and dissolved substances are re-

moved. The safe, naturally treated **effluent** (the liquid from the septic system) then flows into surface or groundwater.

2. Distance from the well

If a septic system is too close to a well, contaminated effluent can get into the well water. Current Tennessee regulations require septic systems to be at least 50 feet from a private drinking water well. Ideally, the system is also downhill from the well or any other source of drinking water.

If a septic system is close to a well or uphill from it, the water source is not necessarily being contaminated. However, proper maintenance of the system becomes even more important to reduce the risks of contamination.

3. Distance from trees

Roots can enter drainfield lines and plug them. Effluent can be blocked in a small part of the drainfield and can saturate the soil, reducing the soil's natural ability to renew wastewater. In extreme cases, flow can be so limited that wastewater backs up into the house.

To prevent this problem, don't install a system in a wooded area. When landscaping, don't plant trees or bushes within ten feet of the field lines. Risk is reduced even more if no trees are within 50 feet of the lines.

If roots plug the lines, removing the trees or bushes may be necessary. Some septic tank additives claim to prevent root growth, but, according to experts, evidence of this is not conclusive.

4. Soil type

If the soil under the drainfield is deep enough and the movement of the wastewater is slow enough, the solids, microorganisms, and dissolved substances in the effluent are removed, producing water of acceptable quality.

If the soil is too shallow (generally less than four feet to bedrock or the groundwater level), the effluent will not be adequately renovated. Likewise, if the texture of the soil is too coarse (as in sands or gravels), wastewater will move quickly and contact time will be too short for adequate natural treatment.

In heavy clays, on the other hand, effluent may move too slowly. The soil may become saturated, re-

sulting in incomplete treatment or in effluent's coming to the surface.

5. Septic tank cleanup

Bacteria cannot completely break down all the solids in the tank. Solids build up over time and reduce the volume of wastewater the tank can hold. If enough accumulates, sludge and scum can plug the drainfield. Pumping your septic tank regularly is probably the single most important thing you can do to maintain your system.

Most systems should be pumped every four to six years. It should be done more often if you have a small tank for your family size, if your household produces a lot of wastewater, if you use a garbage disposal frequently, or if your family often disposes of trash in the system. On the other hand, if you have a large tank and a small family, conserve water, and are careful about what you flush, pumping the system may only be necessary every 10 to 12 years or even less frequently.

6. Traffic over the system

The weight of vehicles or heavy farm equipment can damage the septic tank and drainfield. Reroute traffic and change driving patterns if needed. If you are planning a new system, locate it away from traffic. Driveways or other paved surfaces should not be constructed over septic tanks or drainfields.

7. Water conservation

If too much water enters the tank in a short period of time, wastewater is pushed out of the tank before solids and grease have time to separate. The system can be overloaded, and the soil in the drainfield becomes saturated because the water has less time to soak in.

Reducing the amount of water entering your system means less chance of overloading it, which in turn means better treatment of wastes and longer system life. Water-conservation practices such as taking shorter showers, running only full dishwasher or washing-machine loads, and turning off the water while washing or shaving make surprisingly significant reductions. Repairing leaking faucets or running toilets immediately, as well as using water-saving shower heads, toilets, and other plumbing devices, can also help conserve water.

8. Trash disposal

The septic system is not designed to be a dispose-

all. Paper towels, disposable diapers, sanitary napkins, and other trash are not readily digested by bacteria in the tank. They increase the solid buildup, which can plug the system. The more unnecessary trash you flush, the more often your septic tank will have to be pumped. Flushing trash into the tank also increases the system's water load.

Don't dispose of anything in your septic system except wastewater and human wastes.

9. Kitchen garbage disposal

Garbage disposals add to the solid load as well as increasing the amount of water entering the tank. Kitchen wastes like grease, fats, and cooking oils can plug pipes and build up the scum layer in the tank.

Minimize the use of the garbage disposal. Don't add a disposal if you don't already have one. Some experts recommend that disposals not be used by households with septic systems.

Don't put grease or oil down the drain. They can plug pipes or build up in the septic tank. Dispose of them with other household garbage.

10. Chemical disposal

Paints, solvents, pesticides, and similar products can damage your septic system. They can kill the beneficial bacteria that break down sewage, making the treatment process less effective.

Also, bacteria cannot break down some of these chemicals. They pass through the septic system in pure form and may move through the soil to contaminate groundwater.

Dispose of these products according to label directions. Household hazardous waste roundups may accept many of them; contact your local solid-waste authority or county government to find out when one is scheduled in your area. You may be able to give away or swap leftover materials.

These precautions do not apply to household cleaners, laundry soaps, bleach, or drain cleaners. These products should not damage the system with normal use. Also, washing clothes worn when applying pesticides should not harm the system.

11. Symptoms of trouble











Wet spots, standing water, and sewage odors are signs of problems with the septic system. In addition

to being unpleasant, they may signal that the system is contaminating surface or groundwater with bacteria, nitrates, or other contaminants.

Sewage backups are caused by clogs in the drainfield or the plumbing system, or by some other problem blocking the flow of wastewater. Identifying and solving the problem will reduce risks to water quality as well as eliminating unpleasant situations in your home.

Suggestions found in this worksheet may solve the problem. However, unclogging drain lines, expanding the drainfield, or installing a new system may be required.

Remember:

-  Construct a new septic system at least 50 feet from your well or other drinking-water source. Locate it downhill from the well if possible.
-  Don't construct a new system in a wooded area.
-  Plant trees and shrubs at least ten feet from the drainfield.
-  If soil depth and texture are not adequate for a conventional septic system, install an appropriate alternative system.
-  Pump out your septic tank regularly. Pumping may be needed every year or two, or every 10 to 12 years or more, depending on the size of your tank and the amounts of solids and water entering it.
-  Don't drive vehicles or heavy equipment over your septic system.
-  Don't put a driveway or other paved surface over your septic system.
-  Practice water conservation to reduce the amount of water entering your septic system.
-  Don't add water that doesn't need treatment (like water from roof drains, foundation drains, or basement drain pipes) to the flow into your septic tank.
-  Divert surface water from roof drains, driveways, and paved lots away from the drainfield; saturating the soil reduces its ability to treat wastewater naturally.

- Don't dispose of anything in your septic system that can be composted or put in the trash. Minimize the use of your garbage disposal.
- Don't put paint, solvents, pesticides, or similar products into your system.
- Investigate any signs of problems, such as sewage backup, wet spots, or odors. Take timely action to solve any problems you find to reduce risks of contaminating surface or groundwater.

If you want more information . . .

Contact:

- Your county Extension office
- Tennessee Department of Environment and Conservation
Division of Groundwater Protection
L&C Tower, 10th Floor
401 Church Street
Nashville, TN 37243-1540
(615) 523-0762
- Your county health department
- Septic-system contractors or pumpers

Read:

Septic Systems. PB 1423.
On-Site Wastewater Treatment Systems. PB 1472.
The Low-Pressure Pipe Septic System. SP 392-E.

These publications are available from your University of Tennessee Agricultural Extension Service county office.

Download:

These sites on the World Wide Web (WWW) are good places to start when browsing the Internet for information about water quality:

- <http://funnelweb.utcc.utk.edu/~utext>
(University of Tennessee Agricultural Extension Service)
- <http://www.epa.gov>
(U.S. Environmental Protection Agency)

- <http://www.usda.gov>
(U.S. Department of Agriculture)
- <http://h2o.usgs.gov>
(U.S. Geological Survey)
- <http://www.dtnsh.er.usgs.gov>
(Tennessee division of USGS)
- <http://hermes.ecn.purdue.edu:8001/server/water/water.html>
(National Extension Water Quality Database Website, Purdue University)

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