



Maintaining Your Shoreland Septic System

SHORELAND BEST MANAGEMENT PRACTICES

NUMBER 2 IN THE SERIES

What Are Shoreland BMPs?

Best Management Practices (BMPs) are actions you can take to reduce your impact on the environment. BMPs have been described for agriculture, forest management, and construction. This fact sheet describes BMPs you can adopt on your shoreland property to help protect and preserve water quality. In many cases, the best management for shorelands may be retaining the natural characteristics of your property.

Why Are Septic Systems a Problem?

In shoreland areas it is particularly important to maintain your septic system properly because soil and water conditions near shore may make the system less efficient in treating wastewater. Incomplete treatment can result in health risks for humans and water quality problems.

Potential health risks are the most serious concern related to failing septic systems. Hepatitis, dysentery, and other diseases may be spread by bacteria, viruses, and parasites in wastewater. These disease-causing organisms, called pathogens, may make nearshore water unsafe for recreation. Flies and mosquitoes that are attracted to and breed in wet areas where wastewater reaches the surface may also spread disease.

Many of the synthetic cleaning products or other chemicals used around the house can be toxic to humans, pets, and wildlife. These products may reach the ground surface or end up in the water.

Excessive nitrate levels in drinking water can result in serious health problems for infants. High nitrate levels in ground water can result from inadequately treated wastewater.

Inadequate treatment can also allow excess nutrients to reach your lake or stream, promoting algae or weed growth. Algal blooms and abundant weeds not only make the lake unpleasant for swimming and boating, but they also affect water quality for fish and wildlife habitat. As plants die, settle to the bottom, and decompose, they use up oxygen that fish need to survive.

How a Septic System Works

The purpose of an on-site wastewater treatment system, commonly known as a septic system, is to treat sewage from your household. A septic system has two parts: the sewage tank and the soil treatment system. The most common sewage tank in Minnesota is a septic tank that receives raw sewage from the house. Three layers form in the tank: solids settle to the bottom and a layer of scum or grease floats on the surface of a liquid layer (Figure 1). As raw sewage is added to the tank, an equal amount of liquid flows out into the soil treatment system.

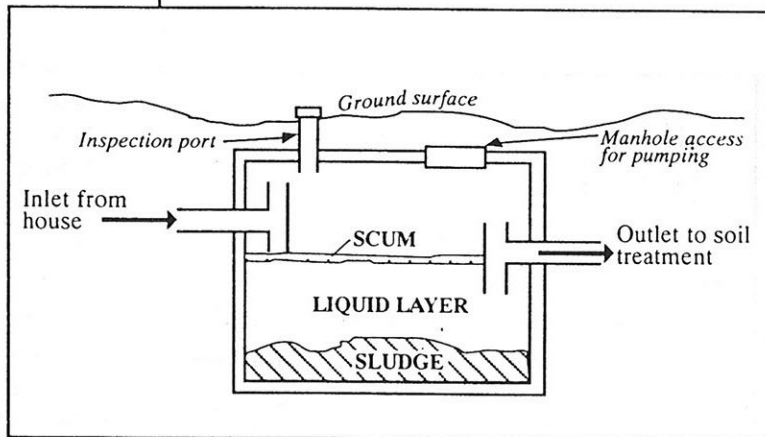


Figure 1: Typical cross section of a septic tank showing the layers of sludge, liquid, and scum. Newer tanks will have access ports for pumping. Older tanks may have a manhole cover that should be removed for pumping. Inspection ports on older tanks are not suitable for pumping.

Wastewater treatment is completed in the soil absorption area. There are three basic types of soil treatment systems. **Drainfield trenches** are the most common and do the most effective job

of treating wastewater. They take full advantage of evaporation and plant life to help treat sewage. **Seepage beds** do not require as large a lawn area, but they have a smaller capacity and are less efficient than drainfield trenches. **Mounds** are elevated systems that may use pressure to distribute sewage effluent. Seepage pits, dry wells, and cesspools are no longer approved and may not be installed. On-site systems with seepage pits should be upgraded to include the proper size tank and drainfield to accommodate the house size and number of residents.

In the soil, microscopic organisms break down remaining biological contaminants such as bacteria or viruses. Nutrients are absorbed by soil particles or taken up by plant life. These processes only work in soil that is not saturated with water. If the soil is too wet, biological breakdown may be incomplete and nutrients may move much greater distances, sometimes hundreds of feet from the drainfield or mound and possibly into surface water (Figure 2). Even systems that appear to be working well or are in compliance with the health code may allow nutrients or bacteria to reach the water.

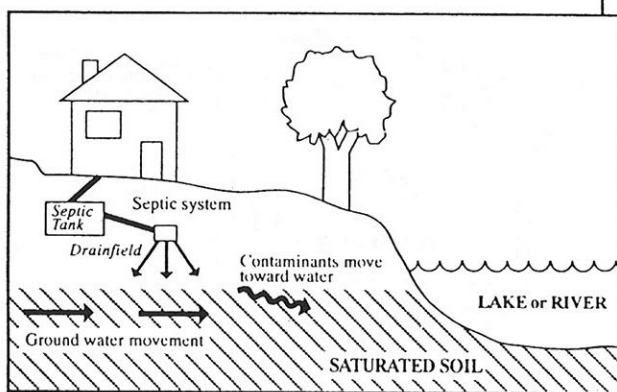


Figure 2: Avoid water contamination from inadequate wastewater treatment! If your system is improperly designed or located too close to the water, contaminants may reach your lake. This figure shows how ground water moving toward the lake can carry contaminants in saturated soil.

How to Tell If There Is a Problem

THESE CONDITIONS INDICATE YOUR SEPTIC SYSTEM MAY BE FAILING

- **Sewage backup in your drains or toilets.** This may be a black liquid with a bad odor.
- **Slow toilet flushing.** Even if you use plungers or drain cleaners, drains may run slower than usual.
- **Wet areas or water seeping near drainfield.** It may or may not have an odor.
- **Excessive growth of aquatic weeds or algae in the lake near your home.** Incomplete treatment of nutrient-rich water seeping from your system promotes this growth.
- **Unpleasant odors around your house.** This may result from improper venting or a failing system.
- **Bacteria or nitrates are found in your well water.** This indicates a serious water contamination problem that may come from your own or a neighbor's failing system.
- **Biodegradable dye flushed through the system shows up in the lake or river.**

What to Do If Your System Fails

IMMEDIATE ACTIONS

- **Call the local health or zoning and planning department.** They will help you get the expert advice you need to solve your problem.
- **Have the septic tank pumped, making sure that sludge as well as liquid is removed.** This will often help solve the problem temporarily, particularly if you also cut back significantly on water use. If the drainfield or household piping is clogged or if high water levels are a problem, this won't help.
- **Fence off the area to minimize contact with wastewater** (for humans, pets, wildlife).
- **Don't use additives.** Additives are no benefit and may harm the system.

THESE ACTIONS MAY HELP IF THE SYSTEM FAILS

- **Increase the absorption field size of the existing system.** This will help if the original field was sized too small for the household or if water doesn't percolate well through the soil.
- **Connect to a community or lakeshore "cluster" sewage system.** Although initial costs may be high, this strategy offers long-term protection for your water resources and environment.
- **Installing a holding tank system** is considered a temporary alternative in many counties, and is not a method of treating wastewater.

LONG-TERM BMPs

The only practical long-term solution may be to upgrade your septic system by redesigning and replacing part or all of it. This work must be done by a registered contractor or a business licensed to design and install individual sewage treatment systems. In many counties, a permit is required for all new construction and replacement.

When remodeling your home or cabin, be sure to expand the capability of your septic system to meet the new demands that will be placed on it. Also, be sure to preserve enough undeveloped space on your property for future expansion of the drainfield.

How to Keep Your System in Shape

Here are several BMPs you can follow to keep your septic system in good working order to protect your lake or river.

HOUSEHOLD HABITS

- **CONSERVE WATER.** Excessive water use is the most common cause of septic failure, so reduce water used for bathing, laundry, and flushing the toilet.
- **Identify and repair** leaking pipes, sticking float valves in toilets, and dripping faucets to reduce water waste. A dripping faucet can waste 15-20 gallons per day.
- **Shorten shower times and choose showers over baths** to minimize wasted water. A full bath uses 50-60 gallons, while a shower uses only about 5 gallons per minute. Of course, a 20-minute shower is not a savings over a bath.
- **Install low-volume toilets and low-flow showerheads.** Typical toilets use 5-6 gallons per flush, providing nearly half the wastewater from a house. Flush toilets using 1½ gallons of water are available.
- **Keep a container of drinking water in the refrigerator.** This saves having to run water until it's cold.
- **Use toilet tissue that breaks up easily when wet** to help prevent clogging. To test tissue quality, place a piece in a jar half full of water and shake. If the tissue breaks up easily, it is suitable. The color of tissue has no effect on septic system action.
- **Do not use the toilet as a wastebasket.** Don't flush facial tissue, diapers, tampons, or any kind of plastic down the drain.
- **Eliminate the use of garbage disposals.** Ground-up garbage does not decompose easily, causes rapid buildup of solids in the tank, and may move out of the tank into the drainfield, clogging distribution pipes and soil pores. If you have a disposal—don't use it. When building or remodeling—don't install one.
- **Never put coffee grounds down your drain.**
- **Dispose of household hazardous waste properly.** See fact sheet #14 for additional tips on reducing household hazardous waste.

FOR CLEANING AND LAUNDRY

- **Wash only full loads in the dishwasher.** Typical dishwashers use about 13 gallons for each wash. Newer models use 8-9 gallons.
- **Use low-phosphate dishwasher detergent.** In Minnesota, detergents may contain up to 11% phosphorus by weight; but some brands may exceed this level, so check the labels.
- **Wash only full loads of clothes and use front-loading washers and suds-savers to save water.** To avoid overloading your system, spread washing over the week instead of washing several loads on one day. A single load takes about 40 gallons.

- **Use liquid laundry detergent** because it's less likely to have fillers or carriers that may damage the septic system. Try to use the minimum amount because detergents can cause problems with the system.
- **Minimize use of household chemicals and cleaners.** Normal amounts of household detergents, bleaches, drain cleaners, toilet bowl deodorizers, and other cleaners won't harm bacterial action in the septic tank.

MAINTAIN THE SEPTIC TANK

- **Discharge all sewage waste from the house into the septic tank.** Don't run wastewater from laundry or saunas directly into the drainfield as the detergent or soap scum will quickly clog soil pores and cause failure.
- **Do not add "starters" to your septic system.** Enough bacteria are available in wastes flushed into the septic tank. Even after the tank has been pumped, enough bacteria will be provided when you use the system again.
- **Do not use additives in your system.** They are of no benefit and may harm the system. Additives that cause the accumulated sludge to increase in volume or float will result in sludge being flushed into the drainfield, plugging soil pores. Also, some additives, particularly degreasers, may be carcinogens that will flow into ground water with treated wastewater.
- **Pump the septic tank every year to remove solids and scum.** Although tanks away from lakes or rivers may not need it every year, annual pumping is excellent insurance near shorelines.
- **Remove the manhole cover when having the tank pumped** to make sure that all solids have been removed. The sludge in the tank should be mixed during pumping. A tank cannot be adequately cleaned through a 4-inch inspection pipe. Pumping through the inspection port may clog the outlet baffle with scum and grease.

Your Investment and Costs

It will cost \$75 to \$150 each time you have a septic tank pumped, but replacing the entire system and drainfield may cost from \$2,000 to \$7,000. Threats to human health and water quality increase if your septic system is not properly maintained.

If water quality in the lake deteriorates, property values are likely to decrease. In addition, if your on-site treatment system fails, you'll have the inconvenience of being unable to use household plumbing until the system is replaced.

For property transactions, a septic inspection is required and the financial institution generally requires proof that the septic system conforms to standards. Minnesota's shoreland regulations require that septic systems within shoreland areas are in compliance with state standards before building permits for additions or new construction are issued.

Overall, your investment to properly maintain a septic tank and drainfield is minimal compared with the cost involved in repairing or replacing the system.

Regulations that Apply

Regulations may vary somewhat in different counties. The state of Minnesota has minimum requirements that apply to shoreland areas, but some counties may have more restrictive ordinances. Check with your county Zoning and Planning, Health, or Shoreland offices for the setback requirements and permits needed in your county.

Setback is the distance away from the shore and is usually measured from the ordinary high water level. In some cases, the setback may be measured from a bluff face or where vegetation begins. The setback for septic systems depends on the type of lake or river. Required setbacks range from 50 feet for general development lakes to 150 feet for remote river segments or natural environment lakes.

The Minnesota Rules for on-site wastewater treatment systems are governed by the Department of Health and the Pollution Control Agency in Chapter 7080. When upgrading or building a new system, be sure to use a licensed contractor who has been trained to comply with these standards.

For More Information...

call

county offices:

- Planning and Zoning Department
- Health Department or Sanitarian
- University of Minnesota Extension Service

regional offices of MN State agencies:

- MN Pollution Control Agency (PCA)

read

Septic System Owner's Guide. Bulletin, PC-6583. Available from county offices of the University of Minnesota Extension Service or Distribution Center.

Get to Know Your Septic Tank. Bulletin, MI-0639. Available from county offices of the University of Minnesota Extension Service or Distribution Center.

FARM-A-SYST worksheet and fact sheet #6, Reducing the Risk of Groundwater Contamination by Improving Household Wastewater Treatment. Contact your county extension office.

PART OF A SERIES...

This fact sheet is one of a series designed to assist shoreland property owners in protecting and preserving water quality. The series includes:

- 1 Understanding Shoreland BMPs
- 2 Maintaining Your Shoreland Septic System
- 3 Installing a Shoreland Septic System
- 4 Ensuring a Safe Water Supply
- 5 Limiting Impact of Recreation on Water Quality
- 6 Developing Shoreland Landscapes and Construction Activities
- 7 Stabilizing Your Shoreline to Prevent Erosion
- 8 Minimizing Runoff from Shoreland Property
- 9 Caring for Shoreland Lawns and Gardens
- 10 Managing Your Shoreland Woodlot
- 11 Valuing Your Shoreland Trees
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- 13 Managing Crops and Animals Near Shorelands
- 14 Reducing the Use of Hazardous Household Products
- 15 Preventing the Introduction of Exotic Species
- 16 Accessing Information to Protect Water Quality
- 17 Shoreland Stewardship Scorecard
- 18 Conserving Water

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Minnesota Pollution Control Agency
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