

1 How Septic Systems Work

The purpose of the septic system is to treat household wastewater when no sewer system is available. A septic system receives all household wastewater including wastewater from toilets, showers, dishwashers, washing machines, and other household plumbing fixtures.

What is a septic system?

A conventional septic system includes a septic tank and drainfield.

Sometimes there is a distribution box between the tank and the drainfield. A septic tank is a buried watertight container often made from concrete, polyethylene, or fibreglass. There may be one or two compartments in the tank, depending on the age of the tank, and there may be an effluent filter at the tank outlet. The size of the tank relates to the size of the house and usually depends on the number of bedrooms in the house and the number of household users. Older tanks are usually smaller than newer ones so it is important for owners of an older septic system to conserve water so the system does not get overloaded. A drainfield is a network underground perforated pipes and a soil filter. The drainfield is often called a leaching bed, absorption field, or tile field.

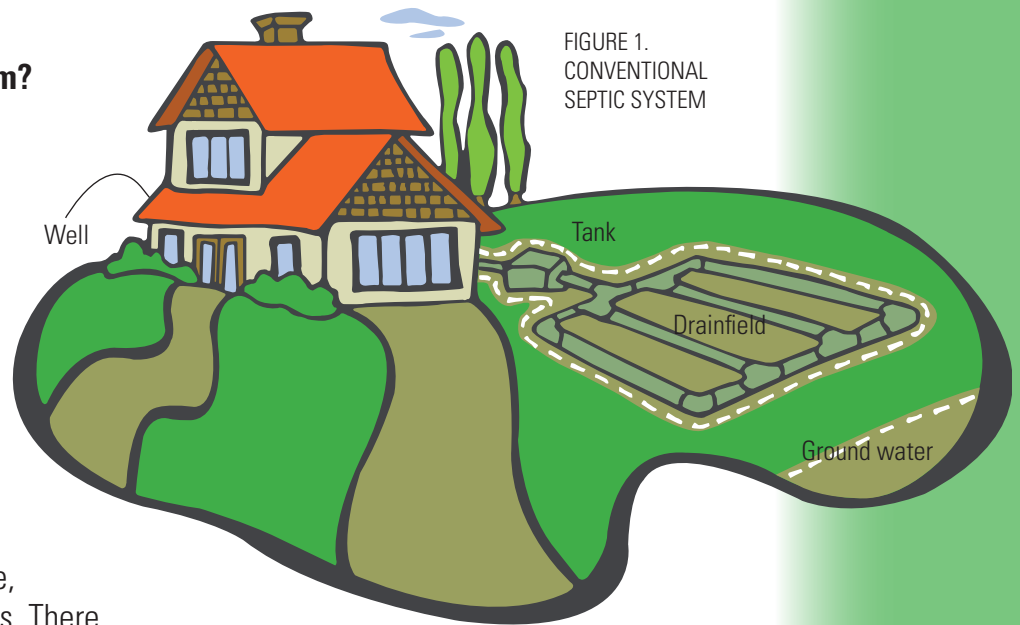
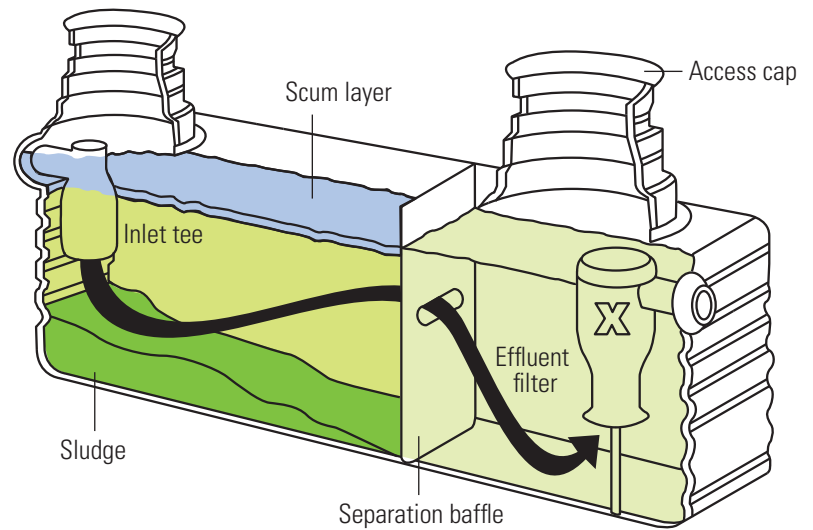


FIGURE 1.
CONVENTIONAL
SEPTIC SYSTEM

How septic systems work

The septic tank separates solids from the liquids and breaks down organic material. As wastewater from the house enters the septic tank, its velocity slows allowing the heavier solids to settle to the bottom and the lighter materials to float to the surface. The solids that sink to the bottom of the tank are called "sludge" and the lighter materials which float to the top of the tank are called "scum". Anaerobic bacteria (bacteria that do not need oxygen) break down some of the sludge. The partially treated wastewater from the middle of the tank flows through an effluent filter, if one is present, and out of the septic tank through the outlet. An effluent filter helps keep solids out of the drainfield and will make the system last longer. After leaving the septic tank, the wastewater may pass through a distribution box, if one is present. The distribution box evenly distributes the wastewater to a network of pipes that lie buried in the trenches of the drainfield. Small holes in the distribution pipes allow the wastewater to seep into the soil. The natural filtration through the soil and further bacterial action remove the remaining particles in the wastewater. When it finally reaches the water table, the wastewater has been treated.

FIGURE 2. COMMON SEPTIC TANK WITH ACCESS RISERS AND EFFLUENT FILTER.



2 Septic System Maintenance

When a septic system is maintained and functioning properly it is an efficient, inexpensive, and safe system. But, if it is failing or not properly maintained, it can cause odours, pollute the surrounding environment, and become a human health hazard. Failing systems can be expensive to repair.

Maintenance

Routine maintenance can extend the life of your septic system. A homeowner must ensure that their septic system is maintained according to their maintenance plan. Systems constructed before the change to the Sewerage System Regulation (2005) may not have a maintenance plan. If you do not have a maintenance plan for your system, an authorized person can create a plan for you (more information provided below). The "Sewerage System Regulation" requires that an

Finding an Authorized Person

To find a registered practitioner in your area contact:

Applied Science Technologists & Technicians of BC — Onsite Wastewater Registration Program

Phone: (604) 585-2788 ext. 238
owrp.asttbc.org

To find a professional in your area contact:

Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)

Phone: 1-888-430-8035
www.apeg.bc.ca/members/sewerageprolist.html

"Authorized Person" install, repair and maintain a septic system. Authorized persons are registered practitioners or qualified professionals who meet the requirements under the Sewerage System Regulation. Registered practitioners are limited to construction and maintenance of Type 1 and 2 systems, whereas professionals are authorized to construct, maintain, and supervise the construction or maintenance of all types of systems.

Inspections

The recommended frequency for inspections depends on the type of septic system, the number of users, and the size of the system. Most systems should be inspected every 3-5 years, though there are exceptions. If your house has a garbage disposal unit (garburator) then your septic system should be inspected every year; or, if you have a package treatment plant, your system should be inspected according to the maintenance plan.

Pumping

A registered practitioner or qualified professional can determine how often your septic tank needs to be pumped out. The septic tank should be pumped out when the tank is 1/3 full of solids. Most septic tanks need to be pumped out every 3-5 years depending on the tank size, amount of solids entering the tank, and habits of the users. The ideal time to have the tank pumped out is in the summer or early fall when better weather conditions make the ground drier. Biological activity in the tank can then re-establish itself before it gets cold, as microorganisms prefer warmth. If sludge is allowed to accumulate in the tank, it will eventually flow into



THE DRAINFIELD,
WARNING SIGNS OF A
FAILING SYSTEM

the drainfield and clog the distribution pipes. When the pipes become clogged, the wastewater can either seep to the surface of the ground creating lush patches of green grass or soggy spots, or it can back up into the house. A malfunctioning septic system can be hazardous to human health and the surrounding environment.

The Effluent Filter

Some septic tanks include an effluent filter. The filter protects your system by preventing solids from clogging your distribution pipes. An effluent filter can make the system last longer and save you the expense of costly repairs. There are many types of effluent filters on the market and special units have been designed to retrofit existing tanks. Consult a registered practitioner or professional to find out which filter is best for your system. If your system has an effluent filter, it should be cleaned regularly. Many filters need to be cleaned every 8-12 months.

The Drainfield

Maintaining your drainfield is easy to do as the drainfield just needs to be left alone to work efficiently. It is important to maintain good ventilation and adequate sunlight to promote evaporation. Ensure that nothing is constructed over the drainfield including: parking areas, patios, decks, or any structures. Oxygen needs to be able to get into the soil to aid the bacteria responsible for digesting the wastewater, as the bacteria need oxygen in order to survive and function. Driving vehicles over the drainfield can crush the distribution pipes or compact the soil. Don't plant trees or shrubs near the drainfield as the roots can plug and damage distribution pipes. Also, do not water the grass over the drainfield, as the additional water may interfere with the ability of the

soil to absorb and treat the wastewater. Make sure that eaves troughs and surface drainage are directed away from the drainfield. The drainfield of a conventional septic system should last at least 20 years, but the distribution pipes can get clogged and the bed will eventually have to be repaired or replaced. The life of the drainfield can depend on the type of piping used and how quickly it breaks down.

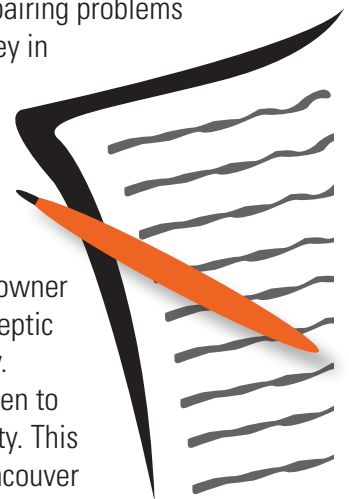
Warning Signs of a Failing System

- Sewage surfacing over the drainfield.
- Lush, green growth or soggy areas over the drainfield.
- Slow or backed up drains, toilets or sinks.
- Sewage odours around the property.

If you notice a problem with your system, it is important to act immediately to protect human health and the environment. Contact a registered practitioner or qualified professional for advice on how to proceed. Repairs can include pumping out the septic tank, repairing a broken tank baffle or cracked pipe, replacing the septic tank, or replacing the drainfield. Repairing problems immediately may save money in the long run as a small problem could turn into a bigger problem which can be more costly to repair.

Record Maintenance

It is important for the homeowner to maintain records of the septic system maintenance history. These records should be given to future owners of the property. This is also a requirement of Vancouver Island Health Authority, which ensures industry and owner accountability.



3 Water Conservation

Minimizing water use is a key element of a healthy septic system is to minimize water use. Low flow appliances and water saving devices improve the functioning of your system as there is less water to dilute the waste, and the wastewater receives a longer treatment period in the septic system. Minimizing water use keeps solids settled on the bottom of the tank, improves the efficiency of your system and extends the life of the system.

Septic systems are designed to hold wastewater long enough to allow solids to settle to the bottom, forming a sludge layer and oils and greases to float to the top forming a scum layer. If too much water is flowing into the septic tank, wastewater is pushed out into the drainfield before settling and separating occurs. The solids will be pushed out into the drainfield and can clog pipes which are expensive to fix. In addition, older septic systems were designed when people used less water. This means your septic system may be under capacity compared to today's standards. If your septic system is older, water conservation is especially important for you.

Tips for Conserving Water

If you are considering purchasing a new appliance, look for the Energy Star symbol, which will save on both energy and water use. If you do not want to purchase new appliances, try retrofitting existing ones.

Faucets

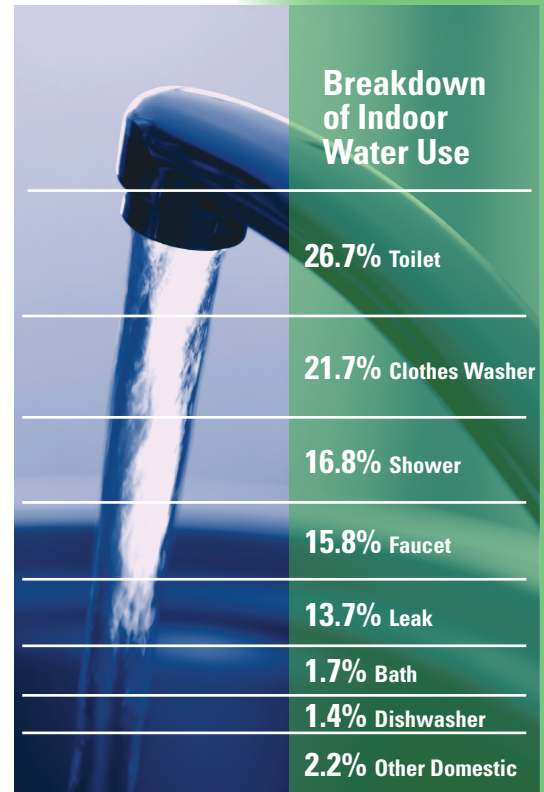
- Fill the sink with water instead of leaving the water running when you are washing dishes or shaving.
- Turn the tap off when brushing your teeth or washing your face.
- Retrofit your faucets with water saving aerators. Faucet aerators can be inserted into most faucets and work by partially blocking water flow. Remember to clean it yearly.
- Replace faucets with water efficient models.

Showers

- Install an efficient showerhead. Current models work effectively using 9 litres of water per minute, saving water and water heating costs.
- Reduce your shower time to 5 minutes or less. This can save up to 40 litres of water every time you shower.
- Recycle unused water. While waiting for hot water to flow when preparing for a shower, catch the cool water in a bucket or watering can. Later it could be used for plants, pets, or cleaning.

Dishwasher

- Only use the dishwasher when full.
- Replace your older dishwasher with an Energy Star dishwasher which uses 25% less energy and a smart sensor which regulates water based on load size.



Toilets

- Reduce the number of times you flush your toilet with multiple uses before flushing.
- Replace your older toilet with a low flow toilet or dual flush toilet. A low flush model uses 6 litres of water, while a dual flush has one button for 3 litres and one for 6 litres. Older toilets can use as much as 13 to 26 litres of water per flush.
- Retrofit your existing older toilet model by using a toilet displacement device. Insert a weighted plastic container, such as a 2 litre pop bottle filled with water, into the tank. This will displace the water and reduce flush volumes. Do not use bricks as they disintegrate with prolonged water exposure and damage your toilet.
- Use a wastebasket. Do not use the toilet as a garbage can as dental floss, cotton swabs and other solids can clog your drainfield. Also flushing just one tissue down the toilet will send more water to the system diluting the wastewater.

Laundry and Household Cleaning

- Operate washing machines at full capacity and use the water saving features.
- When buying a new washing machine, consider purchasing a water-efficient model. As the second largest water user in the home, clothes washers have been redesigned with conservation in mind. Energy Star laundry machines use 50% less energy and 30-50% less water to wash your clothes than non efficient models. Some models even offer water reuse features and low water cycles. When purchasing an Energy Star model, look for a water factor below 9.0.

- Stagger your laundry by doing one load of laundry per day instead of all at once.
- For regular household cleaning use a pail or bucket rather than running water.
- Partially fill the sink or a container when cleaning the kitchen or rinsing cloths.

Outside

- Don't water over the drainfield as excessive water in the drainfield will interfere with the ability of the soil to absorb and treat the wastewater.
- Make sure eaves troughs and any surface drainage is not going into the septic tank, as the additional water will dilute the wastewater.

Checking for a leaky toilet

To check for a toilet leak, use food colouring or a dye tablet (available at the RDN). Place the dye in the toilet tank and leave it for 15 minutes without flushing. After 15 minutes, check the water in the toilet bowl. If the water is coloured you have a leak. Toilet repairs may require the assistance of a plumber.

Note: After you flush your toilet, there will be dye in your bowl for a few flushes.



For more information check out:

RDN Team WaterSmart at www.rdn.bc.ca and click on WaterSmart in the Environmental section.

4 Greener Cleaners

Some cleaning products can be harmful to your septic system as it affects the biological system treating the wastewater. The tank contains bacteria that slowly digest the sludge. The bacteria are sensitive and can easily be upset by chemical products.

Soils in the drainfield contain microorganisms which are also sensitive to harmful chemicals. These chemicals can pass through the soil polluting the surrounding environment. In order to keep a septic system healthy and protect the environment, it is important to be careful of what goes down the drain.

Using powder or flake dishwasher or laundry detergents is not recommended. This can clog the pipes in the drainfield. Septic tank additives that claim they break down the solids faster, can actually kill off the healthy bacteria in your tank and are not recommended. It is a 'rural' myth that biological additives such as yeast or meat need to be added to your system. There is already naturally occurring bacteria in wastewater, which will stimulate the natural biological activity in your system.

If you must use a less green cleaner (such as bleach or ammonia), remember that a little bit in moderation will be okay but it is preferable to avoid if possible.

Ingredients to keep on hand

Cleaning Ingredients

*Baking soda
White Vinegar
Lemon Juice*

Note: If you are storing mixed ingredients in a container, ensure it is LABELLED properly.



Recipes for GREENER CLEANERS



Simple All Purpose Cleaner

½ cup Vinegar
1 cup to 1 litre of warm water
Mix ingredients together for a good surface cleaner and apply.

Scouring Solution

1 part baking soda
1 part water
Mix all ingredients together and apply to hard surfaces.

Window Cleaner

1 part white vinegar
1 part water
Mix ingredients together and spray onto windows or mirrors. Wipe off with a cloth.

Drain Cleaner

½ cup baking soda
½ cup white vinegar
2 litres boiling water
Pour baking soda down the drain, followed by white vinegar. Cover and let stand for 15 minutes. Flush with boiling water.
If this is done weekly, greases that may have built up will melt.

Note: Do NOT use on ceramic toilets, as the boiling water may crack them.

Toilet Bowl Cleaner

2 tbs baking soda
Lemon juice
Sprinkle a few tablespoons of baking soda and scrub with a brush.
Add a few drops of lemon for freshness.

The following organizations have contributed information to this kit: BC Ministry of Environment, Canadian Mortgage and Housing Corporation, Capital Regional District, Cowichan Valley Regional District, Ontario Rural Wastewater Centre -University of Guelph, and Vancouver Island Health Authority.

DO'S



Do take leftover hazardous household chemicals to your approved hazardous waste collection depot for disposal.



Do practice water conservation.



Do have your tank pumped out and system inspected every 3-5 years.



Do divert roof drains and surface water away from the septic system.

DON'TS



Don't allow anyone to drive or park over any part of the septic system.



Don't use your toilet or drains as trash cans by flushing non-degradables down them.



Don't make or allow repairs to your septic system without obtaining the required permit.

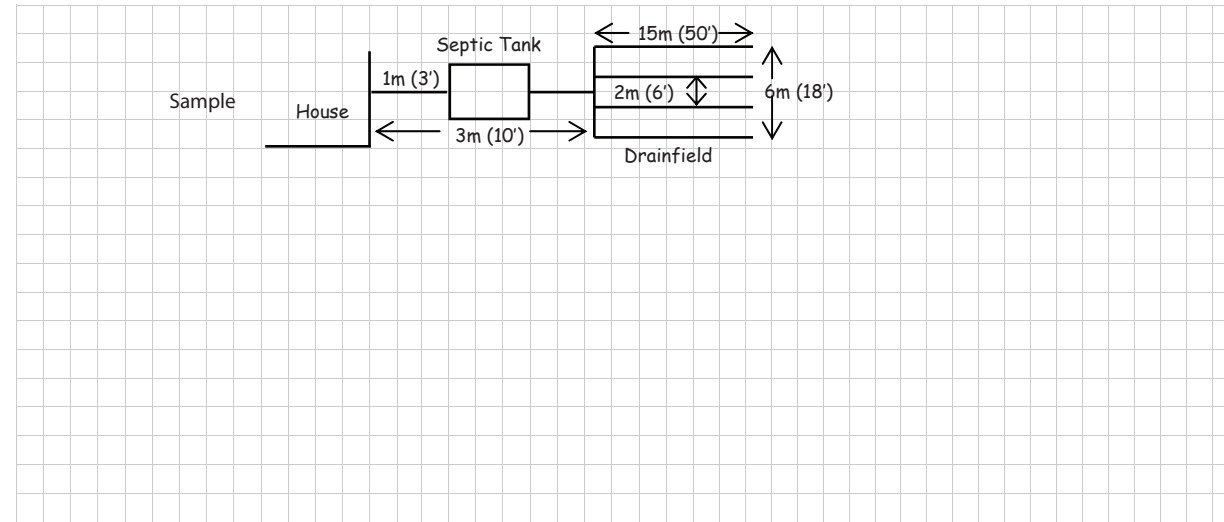


Don't grow trees or shrubs over your drainfield (grass is ideal).

Septic System Maintenance Record

Septic System Sketch

Sketch your septic system below, for future reference. Include your house, tank and drainfield. The sketch does not need to be to scale but writing in measurements is useful.



Record of Maintenance

Note Your Tank Size Here: _____

Date	Nature of Work <small>(pumped-out, general inspection, remedial, etc.)</small>	Company or Inspector's Name <small>(who carried out the work)</small>

For more information contact Island Health (250) 755-6215 (Nanaimo Office) or (250) 947- 8242 (Parksville Office).