



## SEPTIC SYSTEMS

A septic system is a private sewage treatment system. Septic systems are common where there are no municipal sewage pipes for homes, farms, businesses, or other facilities into which to connect. They are less common in large urban areas.

**If you own a septic system, you are responsible for its safe operation, maintenance, and repair.** A properly functioning septic system provides a safe, reliable way of treating your household wastewater.

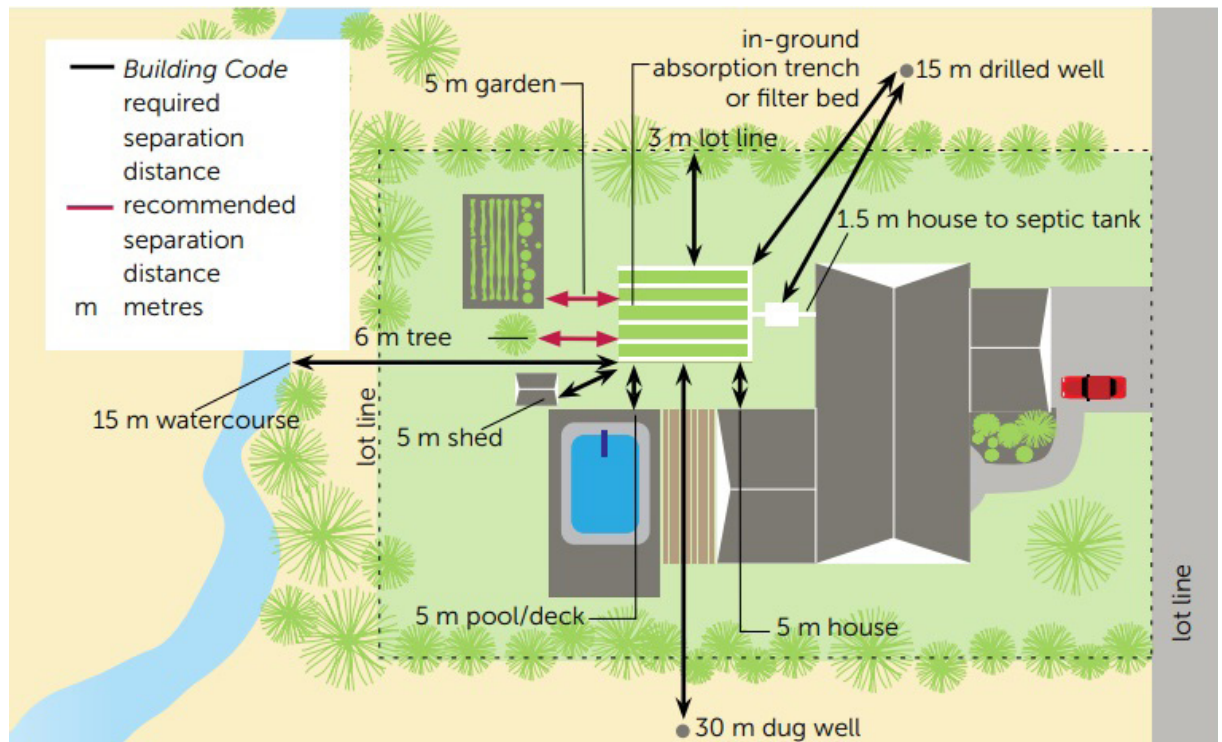
What your septic system looks like, how it's designed and constructed depends on where you live, how much space you have, the characteristics of the surrounding land, and make-up of the soil. Whatever type you have, **all septic systems require careful attention** to design, construction, operation, and maintenance.

**Approval for in-ground sewage treatment and dispersal is required in all parts of Ontario, including the unorganized lands. Approval in the Thunder Bay District is through the Thunder Bay District Health Unit (TBDHU).**

### GETTING TO KNOW YOUR SEPTIC SYSTEM

Small systems (those with a design flow less than or equal to 10,000 L/day) are subject to approval under the Ontario Building Code which are administered by the TBDHU in the Thunder Bay Region. Larger Sewage systems are subject to approval by the Ontario Ministry of Environment, Conservation and Parks.

The TBDHU provides permits for and inspects all new construction in the district to ensure that minimum requirements of the Ontario Building Code are met including regulations regarding the distance between septic systems and well water. See a depiction of separation distances in the graphic to the right. The TBDHU issues Certificates of Approval to construct/install Class 2 through 5 sewage systems for new homes, camps, businesses and for the addition or replacement of existing systems serving existing dwellings.



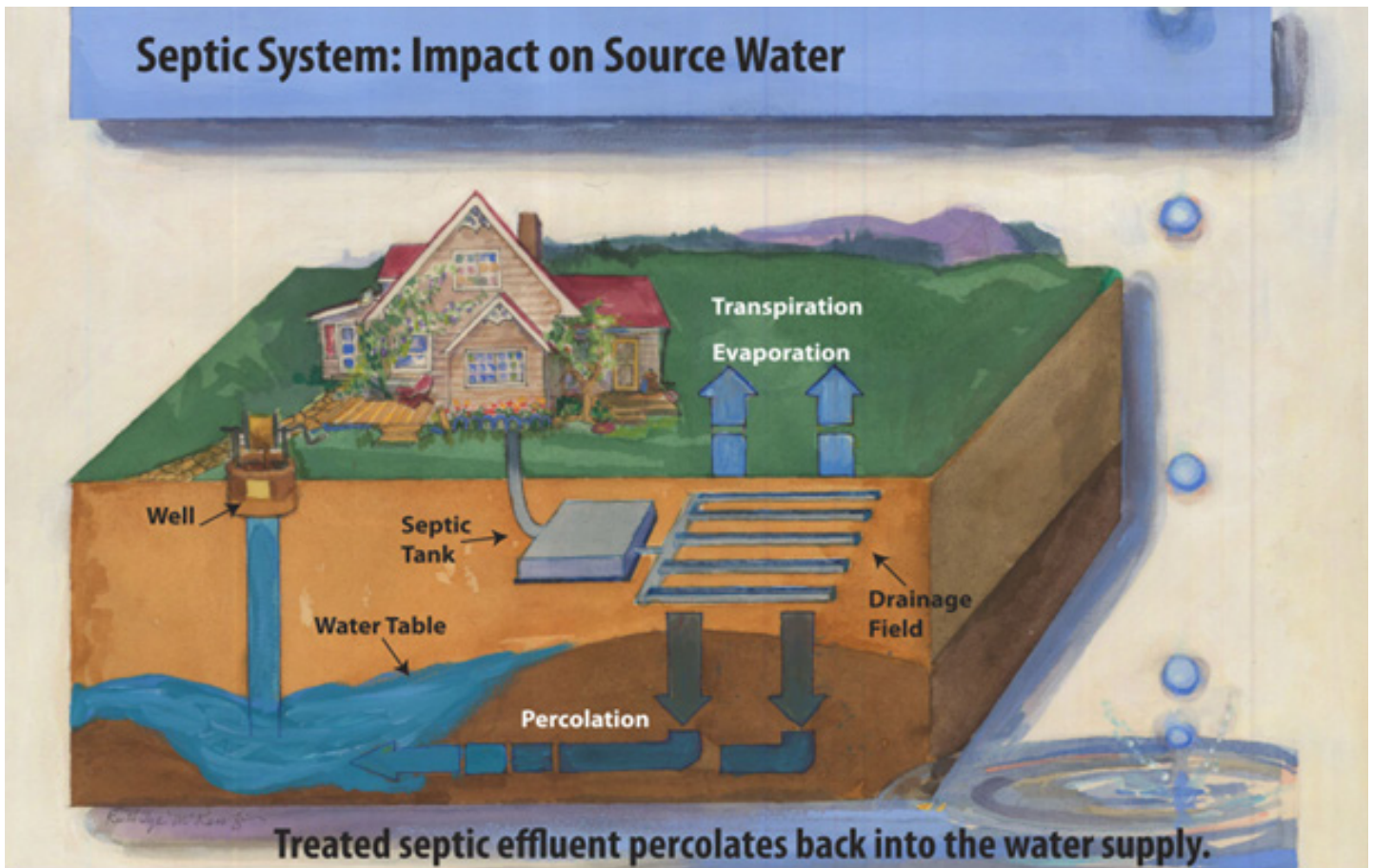
*Separation distances for septic systems in residential settings as required by the Ontario Building Code.*



# CONVENTIONAL SEPTIC SYSTEMS

A **conventional or traditional septic system** is made up of 3 main parts:

- 1 The septic tank:**
  - If you rely on a traditional septic system, your household wastewater flows through pipes to an outdoor, underground septic tank.
  - A septic tank's purpose is to separate solids from the wastewater, store and partially decompose as much solid material as possible, while allowing the waste liquid (or effluent) to separate and then travel to the leaching bed.
  - Heavy solids settle to the bottom of the tank where they are gradually decomposed by bacteria to digested sludge and gasses.
  - Most of the lighter solids, such as soap suds, fats and grease, rise to the top to form a scum layer. This layer remains on top and gradually thickens until the tank is cleaned.
- 2 The leaching bed/leaching field/absorption field/drainage field:**
  - After solids settle in the septic tank, the effluent is slowly discharged to the leaching bed.
  - The leaching bed is made up of porous materials, such as sand and gravel, and acts as a filter to treat the effluent before it percolates back into the soil.
- 3 The soil:**
  - The soil below the leaching bed provides the final treatment and dispersal of the septic tank effluent.
  - After the wastewater has passed into the soil, organisms in the soil remove most contaminants from the effluent before it percolates downward and outward, eventually entering ground or surface water.
  - The type of soil also impacts the effectiveness of the leaching bed; for instance, clay soils may be too dense to allow much wastewater to pass through and gravelly soil may be too coarse to provide much treatment.



Conventional septic system.



## CARING FOR YOUR CONVENTIONAL SEPTIC SYSTEM

These actions protect the safety of your drinking water source and help to extend the life of your septic system.

- **Pump out your septic system every 3-5 years** to prevent contamination of ground water.
- **Know the type of septic system that you have. Know the location, size, and shape of its parts** (e.g. septic tank, leaching bed, electrical control panel) and protect it from damage.
  - Do not dig before knowing the location of your septic system. Do not drive over your septic system. Excessive weight can damage the pipes and tank, and your system may not drain properly under compacted soil.
  - Do not place concrete or plastic groundcover above the leaching bed as this can reduce evaporation and the supply of air to the soil, which will hinder proper effluent treatment.
  - Don't construct anything (e.g. pools, driveways and sheds) on or near any part of the system
  - Do not apply manure or fertilizers over the leaching bed
- **Remember that what you use in your house goes back down your drain and into your septic system.**
  - Use non-toxic and biodegradable cleaning products, soaps, shampoos and personal care products.
  - Avoid using disinfectants like anti-bacterial soaps, bleach, caustic toilet bowl cleaners, and drain cleaners, which kill beneficial bacteria in your septic system tank and may cause sewage to pass through system without treatment.
  - Look for liquid detergents or concentrated detergents that don't contain phosphates. Phosphates can harm local water quality.
- Keep **household items**, such as dental floss, feminine hygiene products, paper towels, condoms, diapers, food solids including compost and coffee grounds, cooking oils, grease, hair, cigarettes, washing machine lint and cat litter out of your system. These **can clog your septic system leaching bed and pipes.**
- **Garburators should not be used with most conventional septic systems.** They will fill the tank much more rapidly and you'll need more frequent pump-outs.
- **Take household hazardous wastes to your municipal hazardous waste or recycling collection facility.**
  - Do not flush paint, cleaners, pesticides, medications, solvents, thinners, nail polish remover, kerosene, antifreeze, gas, diesel or engine oil down drains or into toilets. They can seep into and contaminate groundwater. They may also prevent your septic system from working properly.
  - Do not dump RV waste into your septic tank.
- **Use drop cloths or tarps when working with hazardous materials** such as paints, driveway sealers or wood stain to prevent spills from leaking into the ground.
- **Keep all runoff away from your system.**
  - Water from roofs, driveways or patios should be diverted away from your septic tank and leaching bed area.
  - Consider using interlocking paving stone for walkways and patios to minimize runoff and maximize water retention in the soil.
- **Check with the TBDHU before using septic tank additives.** Commercial septic tank additives do not eliminate the need for periodic pumping and can be harmful to your system. These additives can send more solid waste into your leaching bed where they could cause clogging and premature failure of the leaching bed. Some additives may also contain chemicals that can pollute groundwater.
- **Keep an "as-built" system diagram** in a safe place for reference and to provide potential future owners with a copy.
- **Keep a record of system pumping, maintenance, and repair.**
- Ensure renters or guests are aware of your septic system and its proper use.



# **ADVANCED TREATMENT SEPTIC SYSTEMS**

A properly functioning septic system provides a safe, reliable way of treating your household wastewater.

In Ontario, the *Building Code* contains five classes of sewage treatment systems:

- Class 1 System —a chemical toilet, an incinerating toilet, a recirculating toilet, a self-contained portable toilet and all forms of privy including a portable privy, an earth privy, a pail privy, a privy vault and a composting toilet system.
- Class 2 System – A leaching pit is used for the treatment and dispersal of greywater only.
- Class 3 System – A cesspool is used for the treatment and dispersal of certain Class 1 systems.
- **Class 4 System – A septic tank and leaching bed/tertiary treatment unit, advanced treatment systems; used for the treatment and dispersal of all wastewater.**
- Class 5 System – A holding tank is permitted only by exemption under the OBC. Most rural homes use a Class 4 sewage treatment system as prescribed in the Ontario Building Code. A Class 4 sewage treatment system uses a septic tank along with a leaching bed OR a treatment unit along with a dispersal bed.

The most common class of an on-site sewage treatment system is the **Class 4 system**. This class is commonly referred to as a “septic” or “leaching bed” system. There are two main components of a conventional Class 4 sewage treatment system: septic tank and leaching bed/dispersal bed. **Advanced treatment units** are considered a part of the Class 4 System, and are growing in popularity.



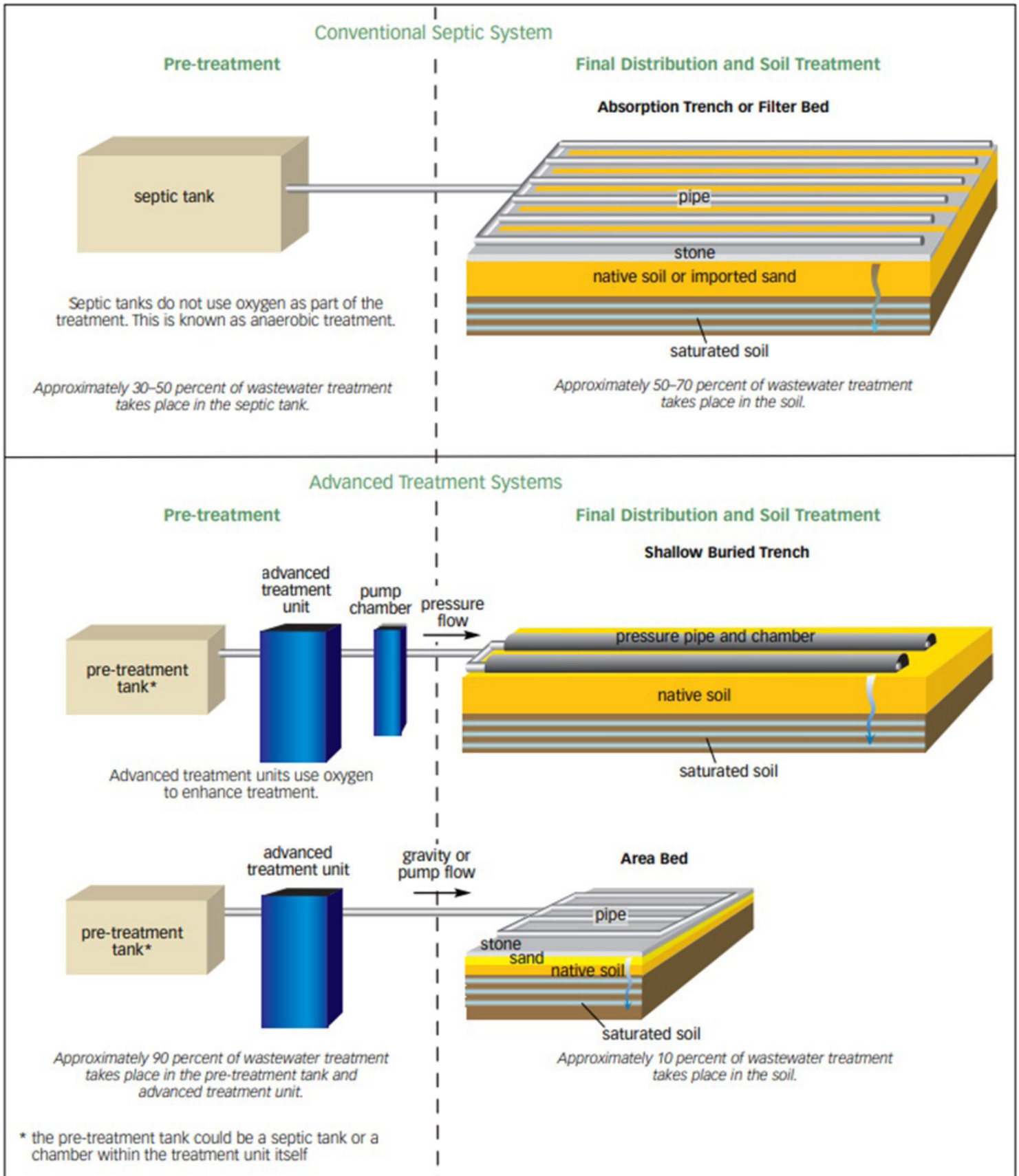
Advanced sewage treatment systems comply with the Effluent Quality Criteria as regulated by the Ontario Building Code (OBC). These systems treat wastewater to a higher degree than a conventional septic system. This can be done through aeration (oxygen) processes, filtration or chemical additive. These treatment units are classified by the level of treatment achieved, and manufacturers of approved systems are listed in the Supplementary Guidelines of the OBC.

The strength of the sewage effluent (including concentrations of phosphorous and nitrogen) can be reduced to about 1/10 the strength of typical residential effluent strength. Because of this, the leaching bed sizing can be reduced to up to one half of what a conventional system would require. This is advantageous for properties that have limited space. Advanced systems are also beneficial for properties with challenging soil conditions and on shoreline properties where receiving waters should be protected from excess nutrients.

**An advanced treatment system treats wastewater to a higher degree than a conventional septic system. These systems are suited for properties with limited space or poor soil quality.**

**Advanced treatment units require maintenance agreements to ensure the system is working properly and efficiently. For further information on maintenance agreements, contact the TBDHU at 807-625-7990.**

## Comparing Conventional Septic System and Advanced Treatment Systems





## CARING FOR YOUR ADVANCED TREATMENT SEPTIC SYSTEM

Advanced treatment systems require more attention and care than conventional septic tanks. **In addition to best practices for conventional septic systems**, these actions will protect the safety of your drinking water source and help to extend the life of your advanced treatment septic system.



- Ensure your system is designed and installed by **authorized** agents or employees. Always check with the distributor to ensure that your installer is **licensed to install their product**. Always check that the installer has the **required qualifications**, i.e., Building Code Identification Number (BCIN).
- An **agreement must be contracted for maintenance and service** with an authorized representative of the manufacturer of the treatment technology. Maintenance agreements will outline the schedule of the inspection of the treatment unit components as well as the effluent sampling requirements to ensure the system is performing in compliance with the basis upon which it was approved.
- **Follow the maintenance requirements and schedules outlined by the manufacturer** in the operations manual to ensure that the system effectively and efficiently. Regular maintenance will help ensure that small problems won't become larger, resulting in more expensive repairs.
- **Know who is providing maintenance** so you can ensure your maintenance/service agreement will meet regulatory requirements. All technologies will require some type of regular pre-treatment tank maintenance — removing sludge or replacement/cleaning of filters.
- Put all your approvals, construction information, and pumping, service, and maintenance agreements in a **safe place**.
- **Keep accurate and up-to-date records** on maintenance, pumping and repairs.
- If selling a property with an advanced treatment system, ensure that the purchaser is aware of maintenance requirements.
- If used seasonally, check with the manufacturer for recommendations on **disconnecting the power supply to the air compressor and/or pumps** as well as start-up recommendations.
- After a power outage or when restarting a system, **ensure the system's components (e.g., pumps, compressors) are functioning**.

**For further information on maintenance agreements, contact the manufacturer of your advanced treatment system or the TBDHU at 807-625-7990.**

## WASTEWATER REDUCTION

Excessive water flowing into the septic tank from overuse of toilets, laundry, dishwasher, showers, and baths, can cause sludge to be disturbed, allowing solids to pass out of the tank and clog your leaching bed pipes and your leaching bed.

- Install low-flow shower heads and toilets.
- Have showers instead of baths and minimize time spent in the shower.
- Turn the tap off while brushing your teeth, shaving, or washing your face.
- Detect and repair leaks in plumbing fixtures.
- Try to spread water use throughout the course of the week, especially laundry.
- Run full loads in both your washing machine and dishwasher.
- Flush toilets with solid waste only.
- Do not leave interior taps running when attempting to prevent water lines from freezing.

## MAINTENANCE

A septic system requires regular maintenance which will vary based on the type, age, and use of the system. The average lifespan of a well-maintained septic system is approximately 15 to 25 years. If you don't maintain your septic system properly, you could be endangering your family's health, the integrity of the natural environment and nearby water sources. Faulty septic systems often pose a contamination threat for homeowners who have wells.

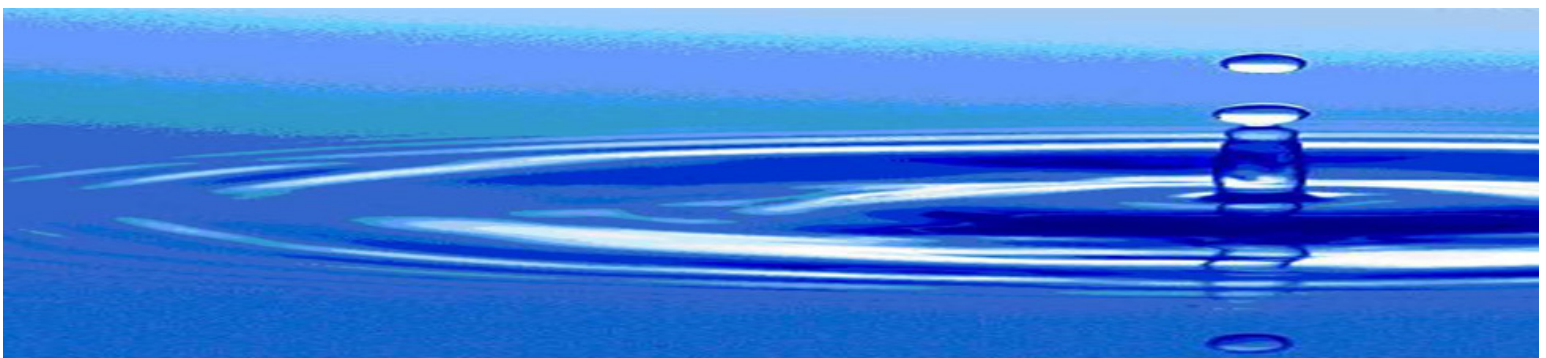
Have your septic system inspected annually and **pump your septic tank as needed** (generally **every three to five years**). Some solid waste and scum will not be decomposed by your system and need to be removed. Not pumping your tank may cause the system to back up into your home or cause an effluent pond to form on top of your leaching bed. Many communities coordinate septic system inspections and pump-out appointments to reduce the cost. Keep all records of pumping, maintenance, and repair.

**Service and maintain treatment units and effluent filters** according to manufacturer instructions. If you don't have an effluent filter, consider installing one.

- An effluent filter will prevent solids from entering and clogging the leaching bed.
- An effluent filter attaches to the outflow pipe leading from your septic tank to your leaching bed. This filter reduces the concentration of suspended matter in the effluent leaving the tank. This provides better environmental protection and prolongs the life of your leaching bed.
- An effluent filter is an inexpensive way to prevent costly tile bed repairs.
- Have your effluent filter checked and cleaned annually or as often as required.

**Locate all pump chambers and ensure pumps and alarms are working properly** (if your system has them). Always **keep the tank access lid secured to the riser**.

**Have the tank replaced if not sound** (e.g. steel tanks are susceptible to decay and last only 20 to 25 years) **or if undersized for sewage flows**. If you turn a seasonal residence into a permanent one, build an addition onto your residence, or add members to your family, your septic system may need to be resized to function properly.



Always wear gardening gloves when planting, weeding, or doing other gardening activities that involve contact with the soil over your leaching bed. This will protect you from direct contact with any harmful organisms that may be present in the soil.

Planting a mix of **shallow-rooted, drought-tolerant, native grasses and perennials** over the leaching bed can help to enhance the performance of your system. Plant roots can prevent erosion and remove excess moisture and nutrients from the soil, making the purification of the remaining effluent more efficient. Native plants are a great choice because they have already adapted to the climate and surrounding environment, resulting in less maintenance and a higher likelihood of plant survival. Allowing native plants to thrive (instead of non-native turf grass) will also reduce the need for lawn mowing.

Examples of suitable native species include:

- Wild strawberry (*Fragaria virginiana*)
- Yarrow (*Achillea millefolium*)
- Meadow anemone (*Anemonastrum canadensis*)
- Red columbine (*Aquilegia canadensis*)
- Black-eyed susan (*Rudbeckia hirta*)
- Poverty oatgrass (*Danthonia spicata*)
- Creeping juniper (*Juniperus horizontalis*)
- Bearberry (*Arctostaphylos uva-ursi*)

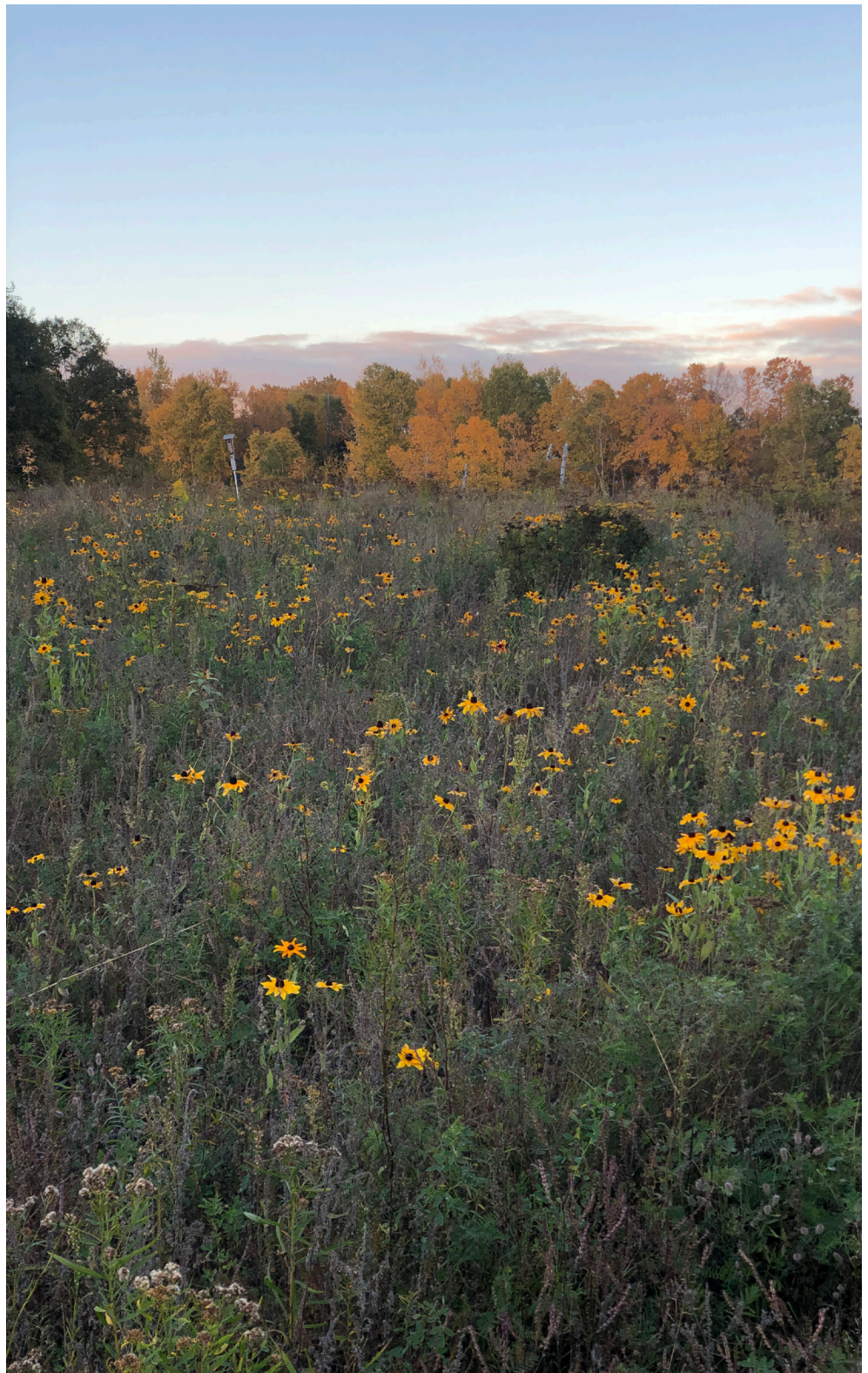
The roots of **woody trees and shrubs are more likely to clog or disrupt** the underground perforated distribution pipes. Plant trees as far away as possible from the outside edges of the leaching bed where the soil will be drier and less conducive to root growth.

Trees should be planted at least as far away as their estimated root spread at maturity. One way to measure this is by the height of the mature tree.

- For example, if a tree is expected to grow about 20 meters tall, then it should be planted a minimum of 20 meters away from the leaching bed.

Do not plant trees with aggressive root systems around the leaching bed.

- Poplar and aspen – Can have root systems that spread up to 4 times the height of the tree.
- Willow – Have moisture-loving root systems that are especially notorious for damaging leaching beds.
- Silver maple – Have very dense and shallow roots that can extend over 15 meters.





## Septic Systems

Did you know your septic system can affect your water quality?

**Reduce your risk of water contamination from septic systems by:**

- Pumping out your septic system regularly.
- Keeping a record of when your septic system has been pumped, and when any maintenance has been done on your system.
- Do an annual visual inspection of your septic system.
- If your system is malfunctioning, contact a professional to fix the issue, or replace the system.

#SepticSmart



## ? WHEN SHOULD I BE CONCERNED?

- Whenever sinks, showers and toilets back up with sewage or drain slowly.
- If the lawn over the leaching bed is spongy or has abnormally lush vegetation growth.
- If there are soggy areas, areas with surfacing grey water, or areas with surfacing sewage, on or near the leaching bed.
- When there is a sewage odour in your home or over the area of your leaching bed.
- If the plumbing system makes gurgling sounds.
- If dosing pumps, if your system has them, run constantly or not at all.
- If nearby well or surface water tests indicate high levels of nitrates, bacteria, or other contaminants.

If any of these issues are happening, you should contact a **septic system inspector** immediately. For questions regarding the inspection process, please call the **TBDHU at 807-625-7990**.

## i ADDITIONAL INFORMATION

- **Lakehead Region Conservation Authority:** [www.lakeheadca.com](http://www.lakeheadca.com)
- **Thunder Bay District Health Unit:** [www.tbdhu.com/health-topics/sewage-treatment-systems](http://www.tbdhu.com/health-topics/sewage-treatment-systems)
- **Ministry of the Environment, Conservation and Parks:** [www.ontario.ca/page/ministry-environment-conservation-parks](http://www.ontario.ca/page/ministry-environment-conservation-parks)
- **Canadian Water & Wastewater Association:** [www.cwwa.ca](http://www.cwwa.ca)
- **Ontario Clean Water Agency (OCWA):** [www.ocwa.com](http://www.ocwa.com)
- **Ontario Rural Wastewater Center:** [www.ontarioruralwastewatercentre.ca](http://www.ontarioruralwastewatercentre.ca)
- **Ontario Onsite Wastewater Association:** [www.oowa.org](http://www.oowa.org)
- **Ontario Building Code:** [www.ontario.ca/laws/regulation/120332](http://www.ontario.ca/laws/regulation/120332)

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