

The drop on water

Wastewater – Septic Systems

Wastewater is often referred to as sewage. This is water that has been used for washing, flushing, or manufacturing processes by homes, businesses, and industries. Wastewater is about 99 per cent water. The rest is made up of anything that goes down the drain, such as human waste, organic waste, and detergents.

Wastewater Disposal

If you live in a rural community or if you have a cottage, you probably have an on-site sewage disposal system, also called a septic system. An on-site sewage system consists of a septic tank for settling and treatment as well as a sub-surface disposal field. About 45 per cent of homes in Nova Scotia have an on-site sewage disposal system.

The remaining 55 per cent of homes dispose of their wastewater through a central collection system. These systems collect wastewater through a network of underground pipes and deliver it to a central location for treatment before it is discharged to the environment. Treatment levels vary and can range from no treatment to very large systems. See our fact sheet *Wastewater – Central Treatment* for more information.

Some homes or cottages have composting toilets, holding tanks, or privies that provide no treatment. In some cases, the sewage must be pumped out frequently and treated off-site.

QUICK FACTS

- Wastewater is used water from homes, businesses, and industries.
- About 45 per cent of homes in Nova Scotia are connected to an on-site septic system for wastewater disposal.
- On-site septic systems reduce the amount of organic chemicals, nutrients, illness-causing germs, and suspended solids that are released into the environment.
- Septic tanks hold sewage long enough for solids to settle or float, and for bacteria to break down some of the solids naturally.
- The liquid waste is evenly distributed in a disposal field.
- Septic tanks should be pumped out every 3 to 4 years.
- Other types of sewage disposal systems, such as holding tanks and privies, still exist and must be pumped out frequently and wastewater treated off-site.

Wastewater – Septi

On-site Sewage Disposal Systems

An on-site sewage disposal system uses natural processes to treat and dispose of the sewage or wastewater from buildings, such as private homes, where central wastewater collection is not available. A typical on-site system includes a septic tank and a disposal field that work together to treat the wastewater. Disposal fields are also called soil absorption areas or leach fields. Figure 1 shows an example of an on-site system.

When properly designed, installed, used, and maintained, on-site systems are economical, effective, reliable, and safe, and can last for many years. However, a system that is poorly designed, installed, used, or maintained could

- contaminate a water supply
- contaminate a watercourse, wetland, or marine water body
- harm human health
- cost a great deal to repair

Figure 1
Components of a Typical On-Site Sewage Disposal System

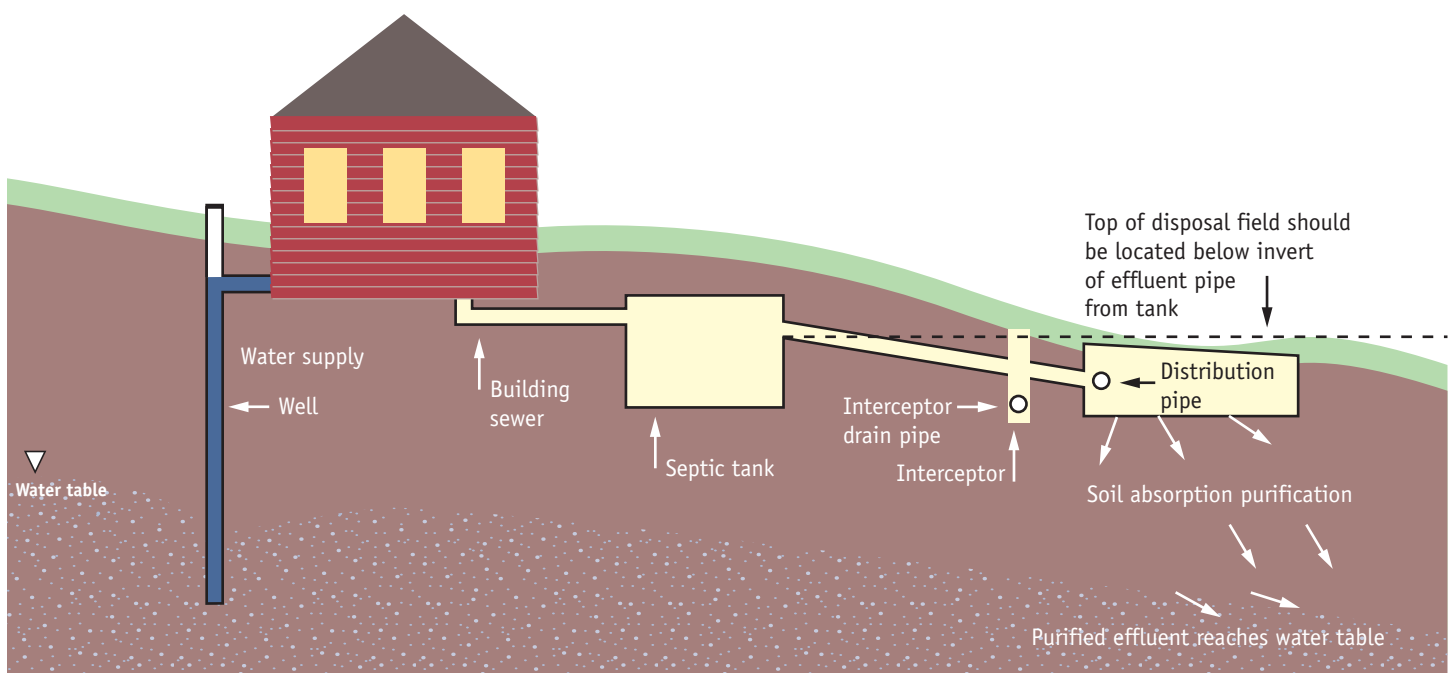


Diagram not to scale.

c Systems

Septic Tank

Wastewater from the building normally flows by gravity through a building sewer pipe into the underground septic tank as shown in Figure 2. In some cases, wastewater is pumped from the building to the tank. Additional precautions may be necessary when pumping.

Tanks are made of corrosion-resistant materials, such as reinforced concrete, fiberglass, or polyethylene. Tanks must conform to Standard CAN/CSA-B66-00 or the latest version of this standard. The tank is watertight, with a watertight access cover. The access cover is secured as a safety precaution, but removable for maintenance, inspection, and pumping of the tank.

The septic tank (see Figure 2) holds the wastewater for about two days, although actual time depends on water use. This holding time allows the heavier sewage solids to settle and form a sludge layer on the bottom. The lighter solids, fats, greases, and oils float to the top and form a scum layer. The time that the wastewater is held in the tank also allows bacteria naturally found in the wastewater to break down the solids. The tank must be pumped regularly to remove the solids and scum that are not broken down by the bacteria. Otherwise both the sludge and the scum can foul the disposal field. How often you must have the tank pumped depends on the following factors:

- size of the tank
- number of people using the system
- percentage of the wastewater that is solid waste

An average family of four would need their tank pumped every 3 to 4 years.

An outlet in the tank allows the layer of partially clarified effluent to discharge into the disposal field for further treatment. Effluent is liquid waste, or water mixed with waste matter. This effluent still contains pathogens that can be dangerous to human and environmental health.

Wastewater – Septic

Figure 2
A Typical Septic Tank

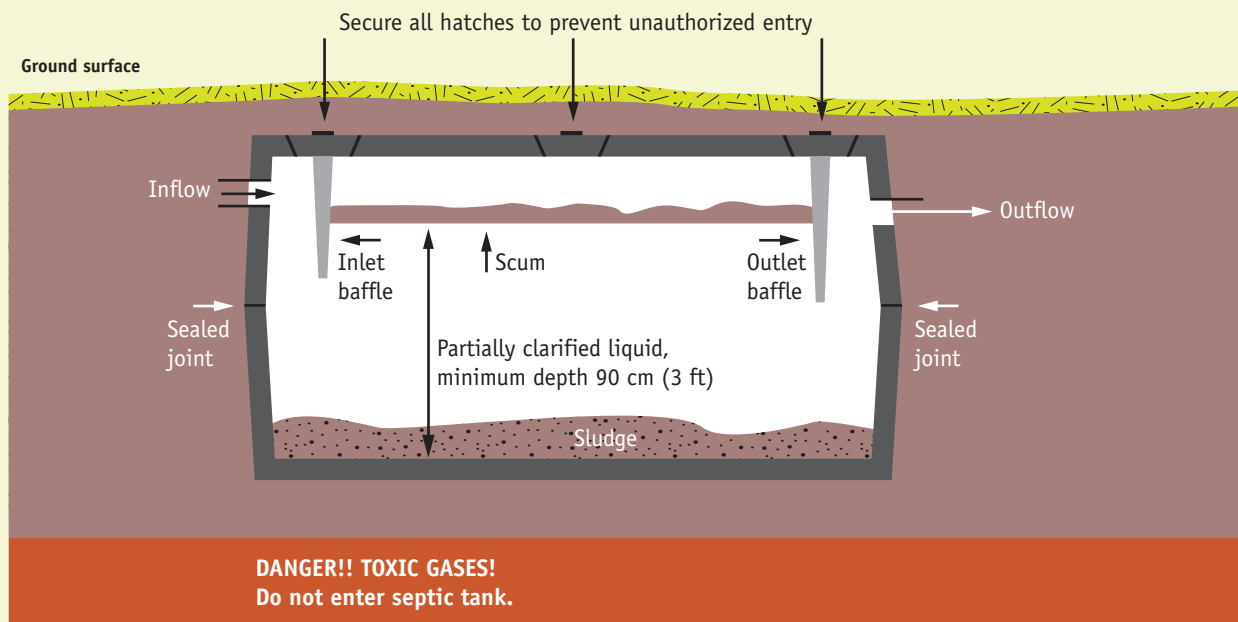


Diagram not to scale.



c Systems

Disposal Field

The disposal field consists of pipes made of perforated plastic that evenly distribute the effluent into the field. Effluent normally flows from the septic tank to a subsurface disposal field through watertight pipes by gravity because the water level in the tank is higher than the level in the field. Systems that cannot be gravity fed have pumps to carry the effluent from the tank to the disposal field.

As the effluent trickles from the pipes into the field, and eventually into the natural soil, microorganisms continue to treat the wastewater. Harmful pathogens are physically filtered out, naturally die off, or are destroyed by soil microorganisms.

Most or all of the effluent will eventually reach the groundwater table. Systems are designed to ensure that effluent is properly treated to remove harmful pathogens before they reach groundwater.

For this reason, it is important to have adequate separation distances from wells, cisterns, and other water bodies. Table 1 is a summary of minimum separation distances required for septic systems. Separation distances relate to the minimum distance between the septic system and its components from features on the lot or adjacent properties. Refer to the On-site Sewage Disposal Systems Regulations and the *On-Site Sewage Disposal Systems Technical Guidelines* for more complete information.

Wastewater – Septi

Table 1 – Minimum horizontal clearance distances as outlined in the On-site Sewage Disposal Systems Regulations and Guidelines

From	To	Distance (m)
System including disposal field, septic tank and pump or siphon chamber, holding tank or privy	Drilled well, with at least 6.1 m casing	15.2
	Dug well or any other domestic water supply	30.5
System including disposal field, holding tank or privy but excluding septic tank, pump, or siphon chamber	Cistern or any other contained water supply	8.0
	Surface watercourse, wetland, or marine water body	30.5
	Downslope ditch or drain that flows intermittently or any artificially created water body, other than an interceptor ditch	15.0
	Municipal or private water distribution system	6.0
	Foundation drainage system	6.0
Septic tank, pump or siphon chamber and effluent pipe	Cistern or any other contained water supply	5.0
	Surface watercourse or marine water body	15.2
	Wetland	30.5
	Municipal or private water distribution system	3.0
	Foundation drainage system	1.5
Disposal field	Well, located downslope	100.0

Disposal fields consist of several components, each with a different purpose. The main components are explained below:

Perforated distribution pipe

The perforated distribution pipe distributes the effluent evenly to all parts of the field through regularly spaced holes.

Crushed rock

Crushed rock surrounds and protects the pipe. It also stores and distributes the effluent over the disposal area.



c Systems

Filter sand

Filter sand provides a place at the boundary between the sand and crushed rock for a biological clogging mat, which will form after a number of months of operation. The sand filters out harmful microorganisms and allows nutrients to break down. This sand must meet specific permeability and size requirements.

Geotextile

A geotextile is a synthetic barrier material that prevents the backfill material from moving down into the crushed rock and clogging the openings between the rock particles.

Sod

Sod protects the disposal field against frost and erosion. This is especially important as rain can wash away the filter sand if it is not protected. Sod also stores surface water that soaks in until it evaporates or is used by plants.

Clean local fill

Clean local fill supports the sod by allowing oxygen and other gases to pass into and out of the disposal field. Imported sand fill may be used, if necessary, but it must meet specific permeability and size requirements.

Natural soil

Natural soil acts as the final filter to remove harmful organisms and break down nutrients before the effluent eventually reaches groundwater, which may flow to a lake or stream and may also supply a well with drinking water.

Interceptor

An interceptor can be a shallow trench at the ground surface, or it can be a trench filled with crushed rock containing a perforated pipe. Interceptor drains divert surface water and shallow groundwater away from the disposal field as shown in Figure 1. They help to prevent soil erosion and prevent the field from becoming water logged.

Wastewater + Septic Systems

Wastewater Management

On-site systems are built to handle certain types and amounts of wastewater. They can treat both blackwater (toilet wastes) and greywater (wastes from the kitchen sink, bath and showers, and laundry). Do not discharge water from other sources to the on-site system, because this extra water may overload the system. This includes water from roof drains, footing and foundation drains, basement sump pumps, heat pumps, and water treatment units.

The following should never be discharged down a drain:

- Unused household chemicals – purchase only as much as you need.
- Unused pharmaceuticals and medications – return unused pharmaceuticals or medications to a pharmacy.
- Fats, oils, and grease – these can block your pipes and may result in expensive repairs. Dispose of these in your regular garbage or in your organics bin collection, if appropriate.
- Paints, solvents, and vehicle fluids – These are household hazardous wastes. Contact RRFB Nova Scotia for disposal information at www.rrfb.com or 1-877-313-RRFB (7732).

For more information, see our publication *Before You Construct an On-site Sewage System* at www.gov.ns.ca/nse/water/docs/OnSiteSewageConstruction.pdf.

FOR MORE INFORMATION

Contact
Nova Scotia Environment at
1-877-9ENVIRO
or 1-877-936-8476

www.gov.ns.ca/nse/water/


NOVA SCOTIA
Environment