



Onsite Wastewater Management Systems

Manitoba Conservation maintains responsibility for the provincial regulations respecting onsite wastewater management systems under the Onsite Wastewater Management Systems Regulation M.R. 83/2003 of *The Environment Act*.

The safe disposal of all human and domestic wastewater is necessary to protect the health of the individual family, the community and the environment.

An onsite wastewater management system may consist of a holding system, a treatment and disposal system or a combination of these for any domestic wastewater (sewage and/or greywater). Each installation should be specifically designed for the premises to be served.

Site Evaluation

A good site evaluation provides sufficient information to design a suitable treatment system from a broad range of design options. The site evaluation helps an installer determine whether or not a property contains a large enough suitable soil area to serve the proposed use of the owner. The site evaluation is the basis for the following activities:

- Considering placement of the wastewater management system in relation to legal descriptions, property easements and caveats, distances to neighbouring property, improvements and zoning requirements, setbacks, physical characteristics of the property, including vegetation, topography, soils and other factors.
- Selecting the proposed depth of the system, with accurate soil descriptions noting water table or bedrock depth or other limiting factors.
- Evaluating soil conditions.
- Conducting a soil percolation or soil analysis test.

Registration

Prior to installation of, or repair to, an onsite wastewater management system (OWMS) you and/or your OWMS contractor must complete a registration form. The form is in triplicate and must be submitted to your local Manitoba Conservation office, together with a site plan, the appropriate payment and any additional information that may be required.

Authorization to Cover

Once a system has been registered and you or your contractor has received approval from your local Environment Officer (your contractor will receive the signed yellow copy of the registration form) you may proceed with construction. However, you or the contractor must notify the local Environment Officer when construction on the system is to occur so that a time for inspection can be arranged. You should provide at least 48

hours notice to the Environment Officer to eliminate any delay in completing the installation.

No person shall install, repair or cover an onsite wastewater management system without authorization from an Environment Officer.

Various Onsite Wastewater Management Systems

Most onsite wastewater management systems consist of two parts;

- 1) A two chambered **septic tank** with:
 - a) a sedimentation chamber for digestion and
 - b) a control chamber for discharge.

- 2) A **disposal area** to which the effluent from the tank is discharged.

SEPTIC TANKS

All septic tanks must:

- be watertight
- have at least two compartments
- be constructed of concrete, fiberglass, polyethylene (or other approved material)
- have a covered, watertight, perpendicular access shaft extending above the ground surface
- have a child-resistant cover
- be CSA approved if prefabricated

The first and larger chamber of the septic tank, called the **sedimentation** chamber, is designed to allow the solids in the wastewater to settle to the bottom of the tank and be broken down in a process called digestion. This chamber must have a minimum size of the greater of 140 % of the total daily sewage flow or 2,250L (500 gal).

The second chamber of the tank is called the **control** chamber. When spillover from the sedimentation chamber into the control chamber reaches a predetermined volume, the contents are abruptly pumped or discharged to the disposal field. The rapid discharge of the effluent ensures distribution over the entire disposal area. This chamber must have a minimum size of the greater of 20% of the total daily sewage flow or 340L (75 gal). (*Fig. 1*)

Septic Tank Location

The septic tank must be at least:

1m (3.25') from	the building
3m (10') from	any property boundary
8m (26') from	any well
15m (50') from	a watercourse, excluding a ditch
8m (26') from	a cut or embankment
3m (10') from	a swimming pool

3m (10') from a cistern

NB. In addition to the minimum set back requirements it is recommended that the tank be located to minimize access problems, as it will require periodic maintenance and pump-outs.

Septic Tank Maintenance

The septic tank is designed to dispose of all wastewater from the home; however there are some points to keep in mind to reduce potential problems.

- *Wise water management is necessary. All OWMS systems have limitations and water conservation should be practiced.*
- *Do not discharge water from weeping tiles and water conditioners into the disposal system. The additional water may overtax the system.*
- *Do not use excessive quantities of bleaching and cleaning compounds. These may reduce the effectiveness of the digestion chamber by destroying bacteria.*
- *Inspect and have the tank pumped out regularly. Unless absolutely necessary, do not clean the tank during the winter months.*
- *If a pump is used to discharge wastewater effluent from the septic tank into the disposal field, you may want to install a filter to protect and extend the lifespan of the pump.*

DISPOSAL FIELDS

The disposal field handles the effluent from the septic tank. The effluent is naturally filtered through the soil where a lot of impurities are removed as it percolates down through the soil. Proper location, construction and maintenance of the disposal field is imperative as this is the final location of the effluent once discharged from the septic tank. The disposal field must not be located in a low area of your property and needs to have positive drainage so that spring runoff and rainwater do not collect in that area.

Two types of disposal fields are in general use; the **trench** type and the **total area** (mound) field, with variations and combinations to accommodate a wide variety of situations. Each of the common disposal field types are outlined briefly following, but first it is important to note that in heavy clay type soils (depending upon the percolation rate) and in coarse sandy soils, onsite wastewater management systems may not be installed. In heavy clays there will be insufficient absorption occurring while in certain coarse sandy soils the percolation rate may be too fast and groundwater may be impacted.

Soil Types

To determine whether a disposal field is permitted on your land, and if so what type and size it needs to be, soil testing is required. Before approving a registration for an onsite wastewater management system Manitoba Conservation requires at minimum a soils analysis (particle size analysis). A soils analysis will provide an idea of the soil composition. However, you may prefer to skip the soils analysis and have a percolation

test carried out in the first instance. This may save you time and money in the long run as your local Environment Officer may request this and certainly will do so if the soil analysis shows the soil to be high in clay.

Percolation Test

The purpose of the percolation test is to give an indication of the ability of the soil to accept the wastewater, as disposal fields rely both on evapotranspiration and percolation to work. There are a number of people you can contact to perform a percolation test, including the contractors in your region and various engineering consultants. Details on the standards for conducting a percolation test are located in Schedule D of M.R. 83/2003,

To install a total area field the percolation rate must fall between 1 minute/inch and 60 minutes/inch. To install a trench style field the percolation rate must be between 1 minute/inch and 120 minutes/inch. **If the percolation rate is greater than 120 minutes/inch neither a total area field nor a trench style field is permitted and alternative options will need to be investigated.** For alternative systems contact your OWMS contractor or local Environment Officer.

For more information on soil analysis and percolation tests contact your local Environment Officer.

Trench Type Disposal Field

This type of disposal field is constructed of trenches with a depth of 60cm – 1m (2-3.25') and trench width of 60cm – 1m (2-3.25'). The excavation is then filled with graded stone to a level of at least 30cm (12"). The perforated pipe is laid out in the trenches and covered by 10-15cm (4-6") of graded stone. The surface shall be covered with a layer of geotextile fabric (or other approved material) to prevent soil infiltration. Or pre-constructed chambers may be used. The entire surface area is covered by top soil. The top should be sloped to achieve positive drainage and seeded to grass. (Fig. 2)

The minimum length of trenching required is dependent upon a number of factors: soil type; number of bedrooms in the dwelling; where stone is used, width of trench and depth of stone; and, where chambers are used, type and size of chamber.

Total Area Disposal Field

This type of field is constructed by digging a shallow excavation to a maximum of 1m (3.25') deep. The excavation is then filled with graded stone to or above the level of the surrounding grade at least 60cm (24"). The perforated pipe is laid out from a central distribution box, most often in a pattern like the spokes of a wheel. The pipes are then covered by another 10-15cm (4-6") of graded stone. The surface shall be covered with a layer of geotextile fabric (or other approved material) to prevent soil infiltration. Finally the entire surface is covered by a maximum of 30cm (12") of topsoil. The topsoil should be sloped to achieve positive drainage, and seeded to grass. (Fig. 3)

The area of the field required depends upon the soil type or percolation rate and the number of bedrooms in the dwelling the system is to service

Disposal Field Location

The disposal field must be at least:

6m (20') from	a dwelling without a basement
11m (36') from	a dwelling with a basement
30m (100') from	a water course, excluding a ditch
15m (50') from	a cut or embankment
8m (26') from	a swimming pool
8m (26') from	water service pipes
15m (50') from	a well (drilled and cased to a minimum of 6m (20') below ground)
30m (100') from	other wells and springs
8m (26') from	property boundaries

Disposal Field Maintenance

Some things to keep in mind for improved operation of your septic field:

- *Keep all traffic off the disposal field.*
- *Insulate the tank, field and lines with a blanket of straw about 30cm (12") deep, especially in the first winter of operation.*
- *Remove large deciduous trees near the field as their roots may block proper drainage.*
- *Investigate any signs of saturation or leakage and reduce water usage to allow the field to dry out.*

Remember: It is an offence to discharge sewage, greywater or wastewater effluent into or onto the ground except in compliance with M.R. 83/2003. If your disposal field is failing you should take action to remediate the situation or you may face prosecution.

Alternative Systems

Holding Tanks

Holding tanks are commonly used for sewage or greywater collection at cottages and in areas where septic fields are not permitted or cannot be properly installed or function. Holding tanks are generally one compartment tanks, which must be pumped out on a regular basis.

A holding tank must be watertight, be constructed of concrete, fiberglass, polyethylene or other approved material, have a covered, watertight, perpendicular access shaft which extends above ground surface, have a child resistant cover and must bear a CSA stamp.

The minimum capacity of a holding tank used in conjunction with a normal water closet is 4,500L (1,000 gal).

Holding tanks must be installed using the same minimum setback requirements as septic tanks, however since these tanks will require frequent pump-out the tank should be located so as to make truck access as easy as possible. A holding tank may not be installed in areas where a pump out service is not available, or facilities for final disposal of the wastewater are not provided.

Greywater Disposal

Greywater is all domestic wastewater from a dwelling and includes bathing, laundering, or food preparation activities and specifically excludes sewage or septage.

A **greywater field** can be constructed in conjunction with the use of a holding tank providing that all the soil conditions and setback requirements can be met. The disposal field location setback distances listed on page 4 apply. The holding tank is used for the collection of the sewage and the greywater field is used to dispose of the greywater. In certain instances when disposing of greywater from a permanent home it may be necessary to install a septic tank to intercept solids and provide limited primary treatment to prevent clogging of the field. In some cases a greywater treatment tank (340L/75 gal) may be of sufficient size to provide adequate pre-treatment. The type of tank installed will be dependent upon the volume of wastewater generated and whether the dwelling is used seasonally or permanently.

A greywater field must be constructed to the same design criteria and to at least 75% of the size of a standard disposal field for that location.

Greywater Pits

Grey water pits are only permitted where a building is not serviced by water under pressure.

A greywater pit is nothing more than a covered hole in the ground filled with stone. It is used to collect small amounts of greywater and disperse it into the surrounding soil.

Greywater pits should not be:

- under the building;
- closer than 15m (50') to a drilled water well equipped with a casing to a depth of not

- less than 6m (20') below ground level;
- closer than 30m (100') to a spring or water well;
- closer than 30m (100') to the normal high water level of a watercourse;
- unless otherwise approved, closer than 3m (10') to any property boundary; or in an area where the soil depth, measured from the bottom of the pit is less than 1m (3.25') from the bottom of the pit to bedrock or normal high water table.

Privies (Outside Toilets)

Privies are normally installed in remote areas or where regular septic services are not readily available. Three types of privies are recognized by the regulation, those being "pit type" which is a hole dug into the ground, "vault type" which has a sealed tank under the unit and is pumped out by a sewage hauling service and "pail type" which has the sewage collected in a small pail and must be emptied on a regular basis.

To have, install, use or permit the use of a pit privy it must be at least:

6m (20') from	any habitable building
15m (50') from	from a drilled well with casing to a depth of not less than 6m (20')
30m (100') from	other wells and springs
30m (100') from	the normal high-water level of a watercourse
3m (10') from	a property boundary

in an area where the soil depth, measured from the bottom of the pit is at least 1m (3.25') from the bottom of the pit to bedrock or normal high water table.

Systems not described by the Regulation

There are a number of OWMS not described by the current regulation. Other methods include composting, use of media such as peat moss to filter sewage and aeration tanks. For alternative methods a variance may be required prior to installation. Should you wish to install such a system talk to your local Environment Officer to learn more about what may be required.