

## **FAQ's: Secondary Treatment – Onsite Wastewater Management Systems**

### **What is secondary treatment?**

Secondary treatment is an additional step in which wastewater effluent is treated to a higher quality before discharge to a disposal field and final infiltration into the soil.

### **What is the difference between primary and secondary treatment?**

The most common initial treatment component is the septic tank which provides primary treatment. Primary treatment is basically sedimentation which involves the removal of floating and settleable materials found in wastewater (i.e. sludge and scum) together with some anaerobic treatment and digestion of sludge and scum.

Secondary treatment involves the removal of biodegradable organic matter and suspended solids. Some secondary treatment methods are capable of nutrient removal (nitrogen and/or phosphorus). Disinfection can also be included.

### **What types of secondary treatment are available?**

There are a variety of secondary treatment units on the market. This document will discuss two types of secondary treatment used in Manitoba.

Note that a variety of secondary treatment systems are available on the market and are not limited to the types discussed in this document. Please contact a certified installer or local distributor to find out what type of system is best suited for your needs.

### **Aerobic Treatment Technology**

Commonly known as package sewage treatment plants, these units are commercially available and come in a prefabricated form for use to treat the wastewater flows from individual residences or small rural businesses.

The most common unit used in residential applications enhance the treatment of raw waste through aeration and activated sludge to lower BOD\* and TSS\* levels and thereby improve the quality of the effluent. Most package sewage treatment plants rely on the introduction of air into the wastewater, which enhances the development of aerobic bacteria that more efficiently reduce organic matter and minimize odors. The application of oxygen greatly reduces the BOD\* and TSS\* concentrations of the wastewater and produces a better quality of effluent.

Secondary treatment quality is typically characterized as producing an effluent quality of 25 mg/L or less BOD\* and 30 mg/L or less TSS\*.

### **Biofiltration Systems**

Biofiltration systems involve the use of peat or synthetic media to treat the wastewater. A peat fiber biofiltration system functions much like a conventional system with the exception that the wastewater is filtered through a layer of peat before being discharged to the disposal field. Several designs of peat filters are on the market; however the most common system installed in Manitoba is the modular system. The modules contain pre-compacted peat. This is a passive system whereby the effluent slowly trickles through the peat and drains directly to the disposal field. Peat treats the wastewater through physical filtration, adsorption and microbial activity.

\*BOD or Biochemical Oxygen Demand – a measure of the dissolved oxygen used by microorganisms in the breakdown of organic substances present in wastewater.

\*TSS – Total Suspended Solids – the amount of insoluble solids floating and in suspension in wastewater.

### **What is the treatment train?**

Wastewater effluent from the dwelling enters the septic tank. It is then pumped or flows by gravity to the secondary treatment unit (package plant or biofiltration unit). From there it flows to the disposal field and into the soil for final treatment and absorption into the soil.

Dwelling → Septic tank → Secondary Treatment Unit → Disposal field

### **Does the Regulation permit secondary treatment?**

Schedule A of the *Onsite Wastewater Management Systems Regulation* permits the use of aerobic treatment units, providing the following requirements are met:

- Units must have a daily treatment capacity equal to or greater than the daily wastewater flow; and
- Must conform to the requirements of NSF Standard 40 for Individual Aerobic Wastewater Treatment Plants published by the National Sanitation Foundation, and bear a valid stamp or mark indicating certification in accordance with that standard.

Biofiltration systems and other secondary treatment systems that are not accounted for in Schedule A may be granted approval pursuant to Section 25 of the Regulation. All systems must provide proof of testing via a recognized and accredited third party certification.

### **How does this affect septic field sizing?**

Manitoba adjusts for the hydraulic loading rate by allowing a reduction of up to 25 % in the size of a disposal field when it receives wastewater effluent from a secondary treatment unit.

### **What about maintenance?**

Maintenance is an important factor for optimum operation of all septic systems. Routine maintenance checks must be carried out on a regular basis by a qualified contractor for the life of a secondary treatment system.

### **Who installs secondary treatment systems?**

In Manitoba a certified installer trained by a “factory” representative must install any secondary treatment system. To obtain information regarding “factory trained certified installers” contact the Onsite Wastewater Systems Installers of Manitoba Inc. (OWSIM). Contact information for OWSIM and a list of certified installers can be found on the Manitoba Conservation Onsite Wastewater Management Systems website at: <http://www.gov.mb.ca/conservation/envprograms/wastewater/index.html>