

Final Report of Septic System Survey for Otter Lake Sustainable Lake Plan

March 2018

Karl Fiander, Otter Lake Landowners Association



Schematic of a typical septic tank and leaching bed (class 4) system

Introduction

The Otter Lake Sustainable Lake Plan outlined several action items to be completed over time including conducting a survey of existing on-site treatment systems servicing waterfront homes and cottages. While conducting the fieldwork, an information package was delivered to each resident. This package included brochures created by the RVCA Septic Office and outlines best practices for system maintenance and a description of advanced treatment units available for those considering improvements or new construction.

To the extent possible, questions were asked directly of property owners about the age and system design. Communication was also completed by phone and email.

During the field work, biophysical site scores for the surrounding area between the septic system and the waterfront were estimated using the method created by Michalski and Usher (1992) and still used by RVCA during development applications. This was done to evaluate any risk factors for septic system performance and also to compare the data from the Watersheds Canada Shoreline Assessment Summary Report produced in July 2016.

What Are Biophysical Site Scores?

Healthy lakes generally depend on the ability of soils and vegetation to extract nutrients and pathogens from effluent before it reaches the water. Soil depth and texture are important. The distance from the septic leaching fields are also important as are the amount and type of vegetation between the fields and the water. Studies have shown that a 30 meter buffer of trees, shrubs and unmown grass can reduce septic pollution to almost zero. 15 meters of mixed vegetation is considered by most to be a reasonable buffer size.

When building sites are being evaluated for development, site scores such as soil, slope and presence of vegetation, are rated on a scale from 0-10 with lower numbers being desirable. The lot assessment is evaluated in part, to determine if a septic system can operate efficiently and with low risk to the nearby water body. Total scores for a particular area that exceed 20 indicate that caution should be applied in further development and that there may be a higher risk of pollution. This doesn't mean that there is in fact more pollution from a site with a higher score but only that there is a higher risk due to limiting factors such as thin or sandy soil, steep slopes and inadequate vegetative buffer.

Many of the residential properties around Otter Lake were built before science-based regulations were developed.

How Does Septic System Design Impact The Lake?

A properly functioning system is designed with consideration of the size of the home and the characteristics of the lot. Greater potential water usage demands a larger or more advanced treatment system. Sometimes regulators demand advanced treatment units on poor building sites that may lack: adequate soil depth or quality, waterfront setback, or have steep slopes. Most traditional tank and leaching field designs rely on the soil to process the nutrients and pathogens discharged from the system. Advanced systems process more of the effluent within their units and the effluent discharge is cleaner and easier for

the environment to handle.

Holding tanks are allowed under very specific conditions. While some areas in Europe encourage holding tanks and enforce the maintenance of them, they are usually not allowed in Ontario for new construction except for temporary use.

Whether a residence is used infrequently or permanently, the size of the system must match up to the potential demand, even if it is only a few weekends per year. Infrequent use imposes hardship on most systems as the biological action in the treatment unit depends on specific bacteria that develop over a period of time. Regular use allows the system to develop and maintain this population.

Since water flows downhill nearly all the effluent discharged eventually ends up in the lake. The more efficiently the unit works and the more waste that is removed by the soil and vegetation, the better it is for Otter Lake water quality.

What Kind of Systems Exist Around Otter Lake?



Ecoflo advanced septic treatment system

There were 266 residential units surveyed. Home septic system units are regulated by the Ontario Ministry of Housing under part 8 of the Ontario Building Code.

There are 5 commercial properties with approximately 229 trailers and cabins usually combined with at least one or more residences. Since these properties are governed by the Ministry of the Environment regulations for systems over 10,000 litres per day, they are not included in this report.

Class 4 systems = septic tank and leaching field	86%
Class 5 systems = holding tanks	8%
Class 4 with advanced treatment units (Ecoflo, Waterloo etc)	5%
Outhouse, composting toilet only	1%

Note that many cottages and homes have outhouses that may have been installed when the cottage was built but are not in regular use once an updated system was installed. About 8% of residences had a “back-up” outhouse.

Biophysical Site Scores

Greater than 20 = higher risk lot characteristics	56%
Vegetative buffers less than 15 meters	48%

The Shoreline Assessment Summary Report completed by Watersheds Canada indicated that 52% of Otter Lake properties would benefit from some shoreline naturalization. They reported that 95 properties were ‘high priority’ with more than 75% of the shoreline either degraded or developed as ornamental. Furthermore, they observed that 85% of the residences were closer than 30 meters to the shoreline indicating that creating adequate vegetative buffers would be difficult. This last point is not surprising since most of the development on Otter Lake predated existing regulations and much of this development is on, or is accessed, over the 1:100 year flood plain.

Septic System Deficiencies

Given that the survey wasn’t a formal inspection it is beyond the scope of this report to quantify deficiencies. However in the process of completing the survey some code violations were observed. These included: leaking holding tanks, broken pipes, and

the most common violation, encroachment of vegetation onto leaching fields. In total, 12% of those properties surveyed had at least one code violation. This is consistent with the data from the voluntary septic inspection program conducted by the Township.

The risks associated with deficient systems include excessive contamination of the lake with nutrients like phosphorus and nitrogen and with harmful bacteria such as E.coli. Determining the source of septic pollution is very difficult so all residents are encouraged to take steps to maintain and improve their systems to preserve the good water quality we have observed in the last 10 years.

Recommendations

As identified in the annual water quality reports by our Lake Steward, and in the Otter Lake Sustainable Lake Plan, Otter Lake has relatively good water quality and there are no current indications that septic pollution is causing deterioration of water quality. Residents of Otter Lake have clearly stated in surveys that water quality is their top priority for their continued enjoyment of the lake so it is important to encourage programs that improve septic system performance, limit shoreline development, and enhance natural vegetation. Through these efforts, residents will continue to minimize the effects of development and minimize the collective effects of septic pollution.

As identified in the Shoreline Assessment Summary Report and in this survey, many residential properties have site scores that demonstrate that improvements could be made to expand vegetative buffers and reduce shoreline development to less than 25% of the total frontage. Given that Otter Lake has a fairly high property density compared to other regional lakes, this shoreline naturalization effort takes on increased importance.

Through proper maintenance and participation in routine septic inspections, code violations should be addressed.



Effluent filter retrofitted to an existing concrete septic tank

What Can I Do To Improve My Septic System?

Here are a few easy and inexpensive tips to improve septic performance:

1. If you can't remember when your septic tank was last pumped, have it cleaned out and inspected. Your pumping service can advise if there are roots, major cracks in the tank or severe deterioration of the concrete. If so these need to be fixed before using the system again. You can consider installing 'risers' over the tank access holes to make it easier to find the holes for an annual inspection. These are available at the Septic Store in Portland or some pump-out service providers can install them.
2. If your system is fairly old, retrofit an inexpensive cleanable effluent filter on the discharge end of the septic tank. This prevents tank solids from reaching the leaching bed and this extends the life and performance of the bed. These filters are included in new systems but if your system is more than 10 years old it probably was not fitted. They are designed to be hosed off once a year and can be accessed easily through the second access hole in the tank. DIY home-owners can easily install them or you can engage a registered installer.
3. Let the grass and shrubs grow between the leaching bed and the lake. Even if the distance is less than the 15-30 meter distance now recommended, any increase in the vegetative mass will help prevent septic pollution reaching the lake. Remember that plant root mass is roughly equivalent to above-ground mass so letting the grass grow a meter high also expands the root system and it's ability to extract nutrients before reaching the water.

- Cottages can settle over time so inspect the ABS plastic pipes leading from the residence to the septic tank to ensure that they aren't cracked and have a positive slope to the tank. Accredited plumbers are responsible for pipes within the building and accredited septic installers are responsible for pipes and equipment outside the building. Regulations allow homeowners to perform simple repairs without permits and complete installations or renovations with permits as long as work meets current codes.



Installation of a plastic riser on an existing septic tank

Additional Reading Suggestions:

Watersheds Canada Shoreline Assessment Report, July 2016. Available at: www.otterlake.org.

Septic Smart...Understanding Your Home's Septic System. Available at: www.rvca.ca

Otter Lake Sustainable Lake Plan, latest version April 23, 2017. www.otterlake.org

Suppliers:

The Septic Store Provides all components of septic systems including tanks, pumps, filters and pipe
2801 Hwy 15, Portland, ON
613-272-3695 www.thesepticstore.com

Armstrong Pumping
Jasper, ON
613-283-7579

Perth and District Septic Service
613-283-0785 www.perthseptic.com Offers pumping and installation of effluent filters and risers