

CASE STUDY

SANDYSUN LAKE CAMPGROUND

2019

Distributor **DBO Expert Canada**

Project Installation of a wastewater treatment system with chemical phosphorus removal at a lakeside campground

Treatment Capacity **68,000 L/day**

Soil Analysis **Permeable**

System Surface Area **855.9 m²**

Particularities of the Site The installation includes a chemical phosphorus removal module as well as different treatment methods based on where the waste water is coming from.



Calibrating the low-pressure headers

BACKGROUND

The Sandysun Lake Campground is located in south-western Québec. Due to its proximity to a lake where people swim, this project required a wastewater treatment system with phosphorus removal to prevent algae blooms from occurring.

Campgrounds tend to have very little wastewater during the week and large amounts near the end of the week when campers empty their holding tanks before leaving. This results in large fluctuations in organic matter and volume.

This System O)) septic system is preceded by a primary treatment and followed by a tertiary treatment.



Pumping station that supplies water to the low-pressure headers



PRIMARY TREATMENT

Primary treatment of wastewater is a physical decantation of liquids and solids, usually done in a septic tank, where the solids are pumped out at regular intervals (usu. 2 years).

The primary treatment is separated into two zones: The **camping zone**, and the **restaurant zone**.

For the camping zone, wastewater is collected in many different pretreatment tanks around the campground, whereas, In the restaurant zone, raw wastewater leaves the building and is collected in a 2.63 m³ grease trap where a large portion of the fats are removed. From the grease trap, the wastewater is pumped into a 11.5 m³ pre-treatment tank. Following this pre-treatment, the water flows to the tertiary treatment unit.



Indexing valve



SECONDARY TREATMENT

This System O)) uses three cells of 39 rows of Advanced Enviro))Septic pipes. The wastewater flows along the length of the rows, where it is treated by bacteria living in the pipes and in the filter sand during the infiltration process.

System O)) septic systems combine wastewater distribution, treatment and infiltration in one simple step.



TERTIARY TREATMENT

The tertiary treatment, in this case, consists in removing the phosphorus from the wastewater.

The effluent leaving the septic tanks is pumped through DBO Expert's static agitator. As it passes through this module, a chemical coagulant is mixed into the wastewater by injection. This causes the inorganic forms of phosphorus in the wastewater to coagulate allowing them to precipitate in the 48.5 m³ settling tank. The settling tank effluent is then pumped into the System O)).

DISTRIBUTION

The wastewater is routed between the many different tanks and modules by pumping stations located throughout the system. The wastewater eventually flows into a pumping station to be directed to the System O)). The proper functioning of the System O)) depends on a uniform distribution of wastewater between the Advanced Enviro))Septic pipe rows. The extremity of each row of Advanced Enviro))Septic pipes is connected to a low pressure injector with an opening through which water is squirted to then flow through the system. This distribution mode ensures even distribution through the 39 rows of a cell. After each pumping cycle, the indexing valve swaps to send the next dose towards the next cell. This is achieved with our Low Pressure Repartition System. This pressurized system ensures that all of the rows of pipes are evenly supplied with wastewater with less than a 2% difference between the rows.



ECONOMIC ADVANTAGES

By installing a System O)) with chemical phosphorus removal, the client saves money in the initial installation compared to other technologies.

A System O)) costs roughly the same as a conventional system, but has a lifespan of over 30 years. Conventional installations can start to fail after 15 years even if they are treated well.

If a system without phosphorus removal were to be used, there is the potential of a blue-green algae bloom resulting in the lake being closed to swimmers. This would result in significant economic losses.

And finally, System O)) requires little maintenance, as there is no media filter to change. Moreover DBO International can train employees, at the client's request, to monitor the system and perform what maintenance is required, in this case mainly related to the chemical phosphorus removal module. This removes most of the annual maintenance costs.



ENVIRONMENTAL ADVANTAGES

Being located so close to water, there is a risk of poorly treated wastewater seeping into the nearby lake where campers swim. Wastewater contains high levels of phosphorus that can lead to a rapid proliferation of a bacteria called blue-green algae that excretes dangerous toxins. By installing a System O)) with phosphorus removal, the risk of wastewater causing these blooms is eliminated.

Purification performance well below the country's standards:

- Less than 15 mg/L of BOD5 (5-day biochemical oxygen demand)
- Less than 15 mg/L of suspended solids (SS),
- Less than 50,000 CFU/100 ml of fecal coliforms, and
- Less than 1 mg/L of phosphorus.

The treatment process of a conventional installation occurs in the soil, while System O)) treats the wastewater within the system, protecting the native soil and nearby waterways.



The finished system, whose land can now be adapted for other uses, such as a soccer field or picnic area.