Saving the Landscape

An engineered wetland treatment system helped a Newfoundland homeowner avoid the expense and disruption of a traditional onsite system

Jim Hynes enjoys striking vistas and plenty of privacy at his lakefront property on Hogan's Pond in St. Phillip's, Newfoundland. He bought the property in the late 1990s, intending to tear down the original house and construct a new luxury 3,500-square-foot ranch home.

In 2001, his plan became a reality. However, he did encounter one problem: His home was under construction by the time he realized how much it would cost to install a traditional septic system and how it would change his property. To reduce the cost and preserve the land's features, Hynes opted instead for an engineered wetland — a compact solution offering effective and low-maintenance treatment.

Caption here.

Site Conditions

The 1.7-acre site slopes down toward Hogan's Pond from the road. A long paved driveway leads to the new ranch home, built only 100 feet from the water's edge. The soils in the area were acceptable for a conventional system of disposal trenches, but the home was located too close to the water to permit such a system. In Newfoundland, the end of the disposal field must be at least 100 feet from the high-water mark of inland water bodies.

Regulators with the Newfoundland Department of Government Services and Lands told Hynes that he would need to install a lift pump and build a 75-foot-square drainfield up-slope from his home toward the road. This would have caused financial hardship, aesthetic problems and environmental concerns.

Trees providing privacy and separating his home from the road would have had to be removed to make way for the drainfield. Once the trees were gone, tons of fill would have been needed to level the drainfield site. Hynes would then face the risk that an eventual drainfield failure would cause untreated sewage to run onto his driveway and lawn. The system would have cost $25,000, plus ongoing expenses for pump maintenance.

System Characteristics

In looking for a better solution, Hynes learned about the PhytoKlare 500 onsite treatment system, based on German engineered wetland technology. The system has three basic components:

- A 1000-gallon, two-compartment concrete septic tank used for settlement of solids and gravity fed from the home.
- A 10- by 20-foot lined wetland cell, fed by gravity from the septic tank. The cell, filled with a patented soil mixture and planted with wetland plants, provides aerobic and anaerobic treatment without pumps or motors. An effluent level regulator is included at the end of the process.
- A disposal pit 4 feet wide by 4 feet long by 4 feet deep, located 80 feet from the water's edge.

Installation

In October 2001, the Hynes system was installed in just under two days. The septic tank was installed first, after which the excavations for the wetland cell and disposal pit were completed. Once the liner in the wetland cell was in place, all pipe and fittings were installed, and the cell was filled with the soil filter media.

Finally, plants were planted, a fence was installed, and the system was ready for use. Abydoz Environmental provided all permitting required, system components and construction. The small footprint fits attractively on the waterfront lot.

Operation

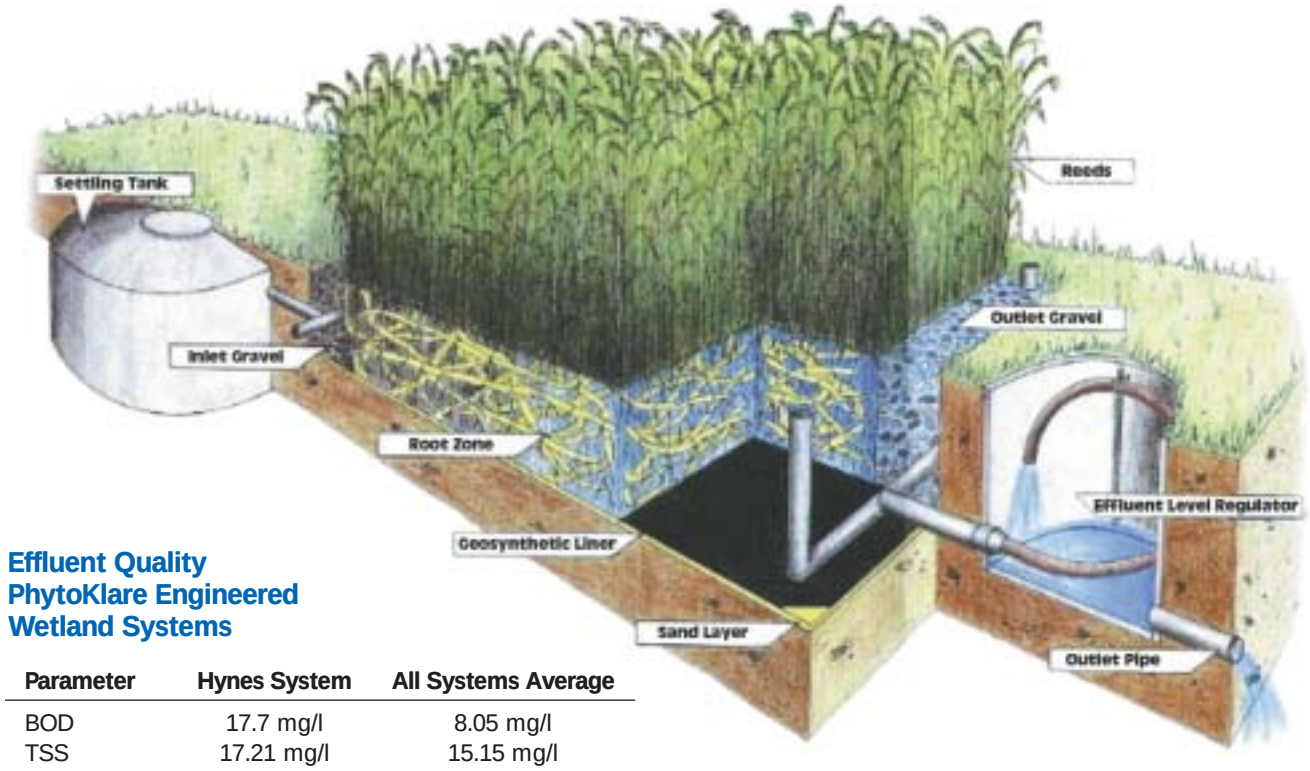
The septic tank provides primary treatment, removing solids and floatables. The lined wetland cell in the middle of the system provides secondary and tertiary treatment. The specialized soil matrix provides high levels of microbial activity and surface area and thus produces high-quality effluent. The disposal area is used to disperse the effluent and is sized based on local regulations.

Performance

The system has performed effectively since installation in both summer and winter conditions. The first measurements were taken one month after installation, and samples have been collected every month since. The accompanying table (far left) shows average effluent quality of the Hynes system and the average of all PhytoKlare Systems installed to date in Canada.

Maintenance

Maintenance is restricted to pumping of the solids from the tank every two to five years, depending on loading. The system also requires occasional visual inspection to ensure that it is working properly. ■



Effluent Quality PhytoKlare Engineered Wetland Systems

Parameter	Hynes System	All Systems Average
BOD	17.7 mg/l	8.05 mg/l
TSS	17.21 mg/l	15.15 mg/l
Nitrogen	51.8% reduction	78.55% reduction
Phosphorus	0.88 mg/l	0.44 mg/l

SYSTEM *profile*

Location:
St. Phillip's, Newfoundland

Facility Served:
3,500-square-foot ranch home

Designer/Installer:
Abydoz Environmental, St. John's, Newfoundland.

Site Size:
1.7 acres

Site Characteristics:
Wooded, within 100 feet of pond

Type of System:
PhytoKlare 500 engineered wetland system

Hydraulic Capacity:
500 gallons per day