



Canadian Shield Consultants

21 King St. West, St-Charles, ON, P0M 2W0

Tel:(705)867-5242 or 1-866-691-0424 Fax:(705)867-9988

Email: office@canadianshieldconsultants.com

www.canadianshieldconsultants.com

Beth Gilbert, M.Sc.

Surface Water Specialist

Technical Support Section – Eastern Region

Ontario Ministry of the Environment, Conservation and Parks

1259 Gardiners Road, Unit 3, Kingston, ON K7P 3J6

P:613-540-6864 F:613-548-6908 E: beth.gilbert@ontario.ca

Cell: 613-561-9783

Jul 7, 2021

Addendum to Lovesick Lake Beach Resort Design Brief March 2021

PHOSPHORUS IMPACT ASSESSMENT

Beth Gilbert, Surface Water Specialist, in her May 17, 2021 email, requested a calculation that shows that the proposed 3 mg/L total phosphorus effluent limit would not result in an increase in loading to the Policy 2 lake.

The property has a history as a resort starting in 1958. The existing wastewater infrastructure is primarily a mixture of holding tanks for trailer sites and a septic system for the office and 2-bedroom cottage. Historic cabins, trailers and tenting sites have been served by a variety of rudimentary wastewater infrastructure measures, with holding tanks being only the most recent approach. Based on GUIDELINE F-9 “The Use of Holding Tanks in Sewage Systems Under Part VIII of the Environmental Protection Act”, it is a policy that holding tanks are not allowed for new construction. The proposed Works #2 abides by this policy and takes responsibility for treating all the sewage generated on the site within the site. In order to compare on a level basis, this calculation models the existing buildings as if they did discharge to the environment using septic tanks as the treatment.

Existing design flow:

	# units	L/d per unit	L/d
Park Model Units (PMU)	22	425	9,350
Recreational Vehicles (RV)	17	425	7,225
Office/1 Bedroom	9		750
2 Bedroom	9		1,100
3 Bedroom	9		1,600
Total			20,025

The MOE “Design Guidelines for Sewage Works” 2008 Table 22-2 “Mass Loadings and Concentrations in Typical Residential Wastewater” states a total phosphorus range of 6-12 mg/L. For this model, 9 mg/L will be used for septic tank effluent.

Total existing	20,025	L/d
P concentration	9	mg/L
P mass	180	g/d

Proposed design flow of Works 2:

	# units	L/d per unit	L/d
Park Model Units (PMU)	22	425	9,350
Recreational Vehicles (RV)	17	425	7,225
Recreational Vehicles (RV) (Phase 2)	38	425	16,150
3 Bedroom*	1	1,600	1,600
			34,325

* this model adds 1,600 L/d to the Works 2 design flow in the March 2021 Design Brief to make sure the phosphorus loading is acceptable, but this flow may be dropped during the Approvals review based on the outcome of ongoing consultation with the owner.

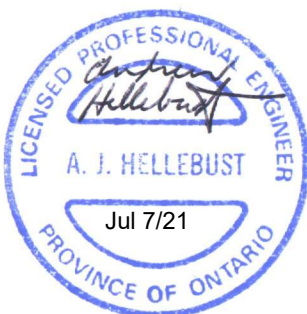
The following table uses 3 mg/L as the effluent target for Works 2. The 3 mg/L is arbitrary to test what loading is acceptable, but the proposed phosphorus removal equipment is capable of achieving this. The office and a 2 bedroom cottage are on an existing septic system (Works 1).

	L/d	P (mg/L)	P g/d
Treated flow (Works 2)	34,325	3	103
Septic tank only flow (Works 1)	1,850	9	17
			120

	P (g/d)
Before	180
After	120

Comparing the before and after values, above, a target of 3 mg/L will produce a lower phosphorus loading to the lake based on the above assumptions, thus satisfying the requirement for a Policy 2 lake.

Yours Sincerely,



Andrew Hellebust,
Senior Engineer, Canadian Shield Consultants