



Val Côté

Sewage Treatment Lagoon

Annual Operating Report
January 1 to December 31, 2021

Prepared by Ontario Clean Water Agency, Northeastern Ontario Hub

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Name of Facility: **Val Côté Lagoon**
 Address: **Lot 15, Concession VII,
 Mattice-Val Côté, Township
 District of Cochrane, Ontario**
 MOE Works #: **120002460**
 ECA #: **7473-92QSLZ**
 ECA Issued On: **December 21, 2012**
 Report Period: **From January 1 to December 31, 2021**

Facility Description:

Capacity of Works	57.7 m ³ /day
Service Area	Community of Val Côté
Effluent Receiver	Six Mile River
Major Process	Dual celled, seasonal discharge waste stabilization lagoon

The Val Côté wastewater treatment lagoon is a Class 1 facility with a design average daily flow of 57.7 m³/day.

The system is fed by individual low-pressure grinder pumps, which feed two cells, each having an effective volume of 6,054.5 m³. The system is a seasonal discharge waste stabilization pond that discharges to the Six Mile River.

The spring discharge period commences no earlier than one week after the ice is off the lagoon and terminating no later than June 30th; the minimum duration is five days. The maximum allowed discharge rate is 28 L/s and an average daily flow of 2,419 m³/d.

The fall discharge occurs from September 24th to December 15th with a minimum duration of fourteen days. The maximum allowed discharge rate is 10 L/s and an average daily flow of 864 m³/d.

1.0 Monitoring Data
1.1 Monitoring Program as Outlined in the Environmental Compliance Approval

cBOD₅ - Five-day carbonaceous biochemical oxygen demand measured in an unfiltered sample
TP - Total Phosphorus
TSS - Total Suspended Solids

1.1.1 Final Effluent

Parameter	Type of Sample	Minimum Frequency
cBOD ₅	<i>grab</i>	
pH	<i>grab</i>	
Temperature	<i>grab</i>	<i>Taken on the start,</i>
Total Phosphorous	<i>grab</i>	<i>middle and end</i>
Total Suspended	<i>grab</i>	<i>of each discharge period.</i>

1.2 Data

1.2.1 Effluent Flow

	Spring Discharge	Fall Discharge
Maximum flow rate (L/s)	2.9	3.0
<i>Compliance flow rate (L/s)</i>	<i>28</i>	<i>10</i>
Average Daily Volume (m ³ /d)	236	239
<i>Objective maximum volume (m³/d)</i>	<i>2,419</i>	<i>864</i>
Discharge Duration (days)	15	15
<i>Specified Minimum Duration</i>	<i>5</i>	<i>14</i>

Refer to Appendix A for Summary of Flow Data

1.2.2 Effluent (Spring Discharge)

The following data is from the spring discharge period of June 11th to June 25th, 2021. A non-compliance occurs when the mean of any 3 consecutive grab samples exceed the compliance limit.

Parameter (mg/L)	Average	Maximum	Compliance
cBOD ₅	2.4	3.4	15
pH (units)	8.52	8.81	-
Temperature (°C)	18.5	19	-
Total Phosphorous	0.748	0.899	1.0
Total Suspended Solids	8.0	24	20

1.2.3 Effluent (Fall Discharge)

The following data is from the fall discharge period of October 7th to October 21st, 2020. A non-compliance occurs when the mean of any 3 consecutive grab samples exceed the compliance limit.

Parameter (mg/L)	Average	Maximum	Compliance
cBOD ₅	2.2	5.2	15
pH (units)	8.61	9.45	-
Temperature (°C)	11.8	15.5	-
Total Phosphorous	0.653	0.968	1.0
Total Suspended Solids	3.0	7.0	20

Refer to Appendix B for a Monthly Summary of Sampling and Monitoring Data

1.2.4 Effluent (Spring Discharge) – Seasonal Loadings

Parameter (kg/day)	Loadings	Compliance
cBOD ₅	0.56	Average 36.29
Total Suspended Solids	1.89	Average 48.38
Total Phosphorous	0.18	Average 2.42

1.2.5 Effluent (Fall Discharge) – Seasonal Loadings

Parameter (kg/day)	Loadings	Compliance
cBOD ₅	0.53	Average 12.96
Total Suspended Solids	0.72	Average 17.28
Total Phosphorous	0.16	Average 0.86

Refer to Appendix C for a Summary of Effluent Loading

2.0 Interpretation of Monitoring and Analytical Data

The effluent quality is based on the carbonaceous biochemical oxygen demand, total suspended solids, and total phosphorus levels.

The Carbonaceous Biochemical Oxygen Demand (cBOD₅) is a 5 day test which represents the oxygen demand from organic compounds and the oxidation of inorganic compounds such as ferrous iron and sulphide. High BOD₅ or cBOD₅ in effluent means a large quantity of oxygen was needed to break down the organic matter, and identifies a large amount of organic matter in the effluent indicating inadequate treatment. Both seasonal averages for cBOD₅ complied with the limit of 15 mg/L. The cBOD₅ loading was 0.56 kg/day during the spring discharge which complies with the limit of 36.29 kg/day and 0.53 kg/day during the fall discharge, complying with the limit of 12.96 kg/day.

Total Suspended Solids (TSS) in effluent are composed of settleable solids and nonsettleable solids depending on the size, shape and weight of the solid particles. Settable solids are large sized particles that tend to settle more rapidly in a given period of time. Both seasonal averages for TSS complied with the limit of 20 mg/L. The TSS loading was 1.89 kg/day in the spring and, 0.72 kg/day in the fall, complying with the limit of 48.38 kg/day and 17.28 kg/day respectively.

Total Phosphorus (TP) refers to the amount of phosphorus in a sample. Excess TP stimulates algae and weed growth that may cause fluctuations in dissolved oxygen in the receiving waters. The TP levels complied with the limit of 1.0 mg/L during both discharges. The average TP loading was 0.18 kg/day in the spring and 0.16 kg/day in fall, complying with the limits of 2.42 kg/day and 0.86 kg/day.

The monitoring parameters at the Val Côté Sewage Treatment Lagoon were well within the compliance limits specified in the facility's ECA during the spring and fall discharge periods.

3.0 Calibration and Maintenance Procedures Performed on the Works

- No major structural, equipment, apparatus or mechanical maintenance was carried out for 2021
- Lagoon maintenance, including non-scheduled maintenance, is monitored using the Maximo Work Management software program.
- All routine and preventative maintenance measures were conducted as scheduled in 2021.

4.0 Bypasses, Upset or Emergency Events

There were no abnormal discharge events during the reporting period

5.0 Instances of Non-Compliance

There were no instances of non-compliance during the reporting period

APPENDIX A: Summary of Flow Data

	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021
Effluent Discharge / Flow - m ³ /d												
Count	0	0	0	0	0	15	0	0	0	15	0	0
Max						252				261		
Mean						236				239		
Min						116				98		
Total						3544				3584		
Effluent Discharge / Flow Rate - l/s												
Count	0	0	0	0	0	15	0	0	0	15	0	0
Max						2.9				3.0		
Mean						2.7				2.8		
Min						1.3				1.1		

APPENDIX B: Monthly Summary of Sampling and Monitoring Data

Val Cote Spring Discharge Period - one week after ice out to June 30

	08-Jun	15-Jun	18-Jun	22-Jun
Carbonaceous BOD	3.4	2		1.7
Field pH	7.8	8.73	8.73	8.81
Field Temperature	19	19	19	17
Total Phosphorus (as P)	0.668	0.678		0.899
Total Suspended Solids	24	3.5	1.5	3

Val Cote Fall Discharge Period - September 24 to December 15

	12-Oct	19-Oct	26-Oct
Carbonaceous BOD	0.8	0.6	5.2
Field pH	9.45	8.93	7.44
Field Temp	15.5	14	6
Total Phosphorus (as P)	0.408	0.582	0.968
Total Suspended Solids	< 1	1	7

APPENDIX C: Summary of Effluent Loading

Loading Calculations

$$\boxed{\text{Seasonal average result } \frac{\text{mg}}{\text{L}}} \times \boxed{\frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}}} \times \boxed{\text{seasonal average flow } \frac{\text{m}^3}{\text{year}}} = \boxed{\text{Loading } \frac{\text{kg}}{\text{year}}}$$

convert from mg/L to kg/m³

Spring Calculation

 cBOD₅ Loading Calculation

$$\frac{2.4 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{236 \text{ m}^3}{\text{a}} = \frac{0.56 \text{ kg}}{\text{a}}$$

Total Suspended Solids (TSS) Loading Calculation

$$\frac{8.0 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{236 \text{ m}^3}{\text{a}} = \frac{1.89 \text{ kg}}{\text{a}}$$

Total Phosphorous Loading Calculation

$$\frac{0.748 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{236 \text{ m}^3}{\text{a}} = \frac{0.18 \text{ kg}}{\text{a}}$$

Fall Calculation

 cBOD₅ Loading Calculation

$$\frac{2.2 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{239 \text{ m}^3}{\text{a}} = \frac{0.53 \text{ kg}}{\text{a}}$$

Total Suspended Solids (TSS) Loading Calculation

$$\frac{3 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{239 \text{ m}^3}{\text{a}} = \frac{0.72 \text{ kg}}{\text{a}}$$

Total Phosphorous Loading Calculation

$$\frac{0.653 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{239 \text{ m}^3}{\text{a}} = \frac{0.16 \text{ kg}}{\text{a}}$$