

# Omeme Sewage Lagoon

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Works # 110001630

## Annual Wastewater Performance Report

Prepared For: The City of Kawartha Lakes

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup>, 2020

Issued: March 19, 2021

Revision: 0

Operating Authorities:



### **2020 Performance Report for the Omemeo Sewage Lagoon**

Amended Environmental Compliance Approval 2737-B4DH46, Section 11(4) requires the Performance Report to contain the following:

- a. a summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
- b. a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;
- c. a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
- d. a summary of all operating issues encountered and corrective actions taken;
- e. a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- f. a summary of any effluent quality assurance or control measures undertaken;
- g. a summary of the calibration and maintenance carried out on all Influent and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- h. a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
  - i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
  - ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- i. an estimate of the volume of sludge in the lagoon cells. Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period;

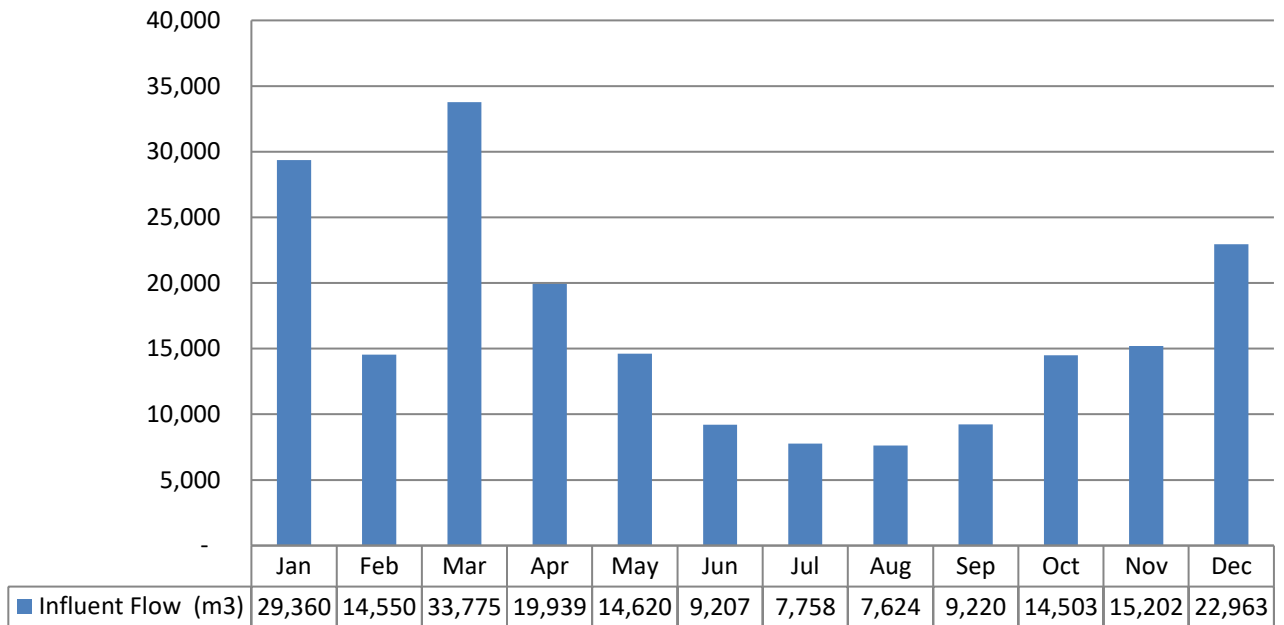
- j.** a summary of any complaints received and any steps taken to address the complaints;
- k.** a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- l.** a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.
- m.** a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted.

The following is a report from the records maintained by the Ontario Clean Water Agency for the Omemeo Sewage Lagoon for the year 2020.

- a.** Environmental Compliance Approval Number 2737-B4DH46 requires a summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates.

The Environmental Compliance Approval requires that everything practicable be undertaken to operate the Sewage Treatment Plant so that the annual average daily influent is within the Rated Capacity. The Rated Capacity of the Omemeo Sewage Lagoon is 1,353 m<sup>3</sup>/day and the 2020 annual average daily influent flow was 541.69 m<sup>3</sup>/day or 40.04% of the Rated Capacity. The total Influent flow in 2020 was 198,719.55 m<sup>3</sup>.

**Graph 1: 2020 Influent Monthly Flow Totals**



**Graph 2: 2020 Influent Daily Minimum, Maximum and Average Flows**

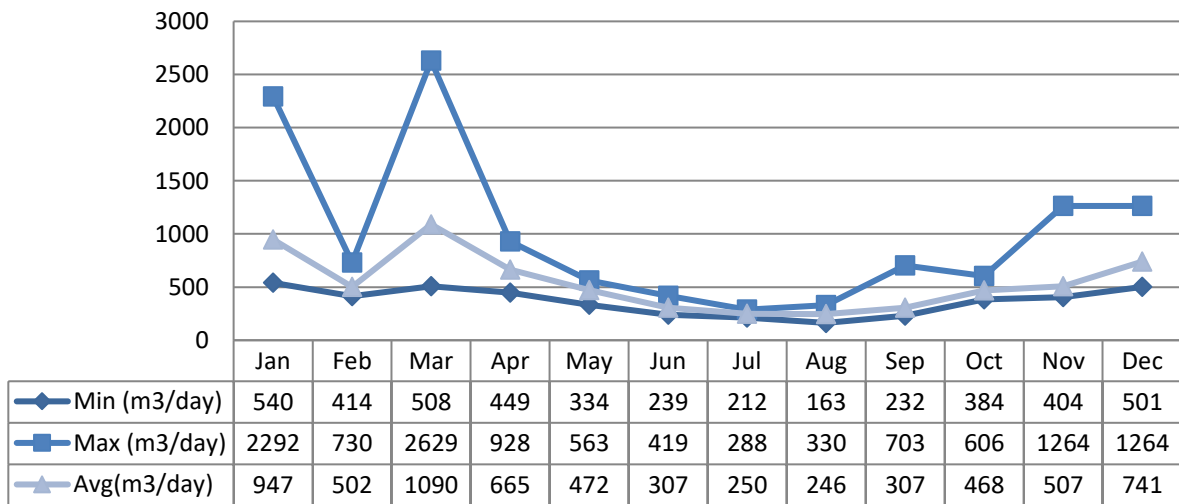


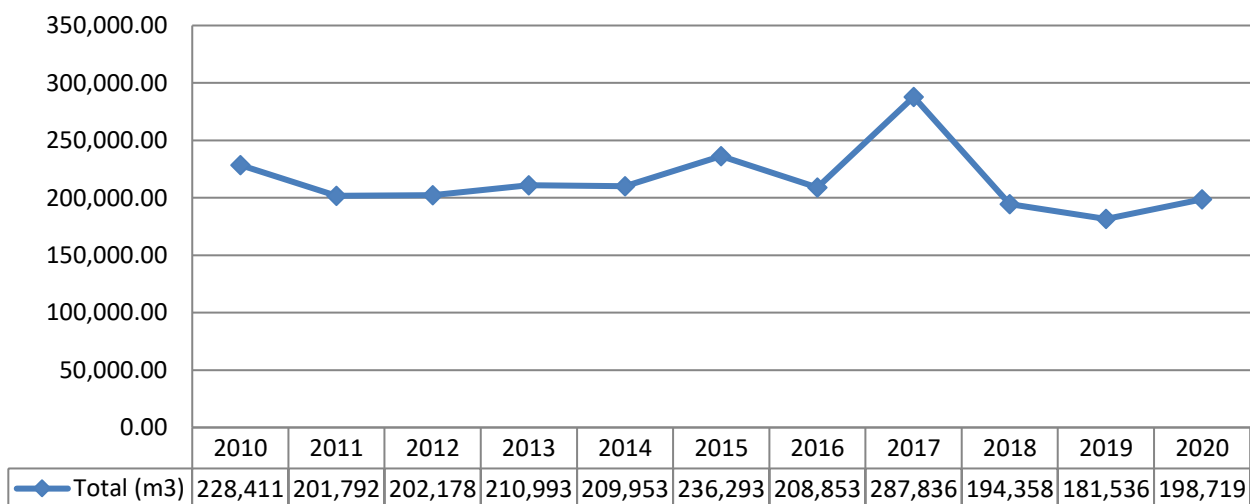
Table 1 reviews the historical trend of the influent sewage characteristics for the Omeme Sewage Lagoon, as required by Environmental Compliance Approval 2737-B4DH46, Condition 10 (4) (a).

**Table 1: 2010 – 2020 Historical Average Influent Sewage Characteristics for the Omeme Sewage Lagoon**

Year	BOD (mg/L)	TSS (mg/L)	Phosphorus (mg/L)	TKN (mg/L)	TAN (mg/L)
2010	129.40	295.35	3.47	N/A	20.17
2011	133.45	149.48	3.27	27.62	23.34
2012	125.00	164.16	3.89	32.59	22.95
2013	105.25	530.68	3.15	28.07	22.37
2014	122.91	107.08	2.48	22.13	18.53
2015	134.63	133.81	2.42	21.71	N/A
2016	187.66	218.58	3.36	28.15	N/A
2017	117.08	168.75	2.09	18.15	N/A
2018	157.18	267.45	3.49	28.10	N/A
2019	117.42	138.92	2.23	21.18	N/A
2020	122.42	134.75	2.15	21.53	N/A

Table 1 shows that the Biochemical Oxygen Demand annual average has increased slightly from 2019 to 2020. The 2020 annual average for Total Suspended Solids and Phosphorus has decreased slightly from the 2019 annual average. TKN has remained fairly consistent since 2011.

**Graph 3: 2010 – 2020 Historical Influent Flows for the Omeme Sewage Lagoon**



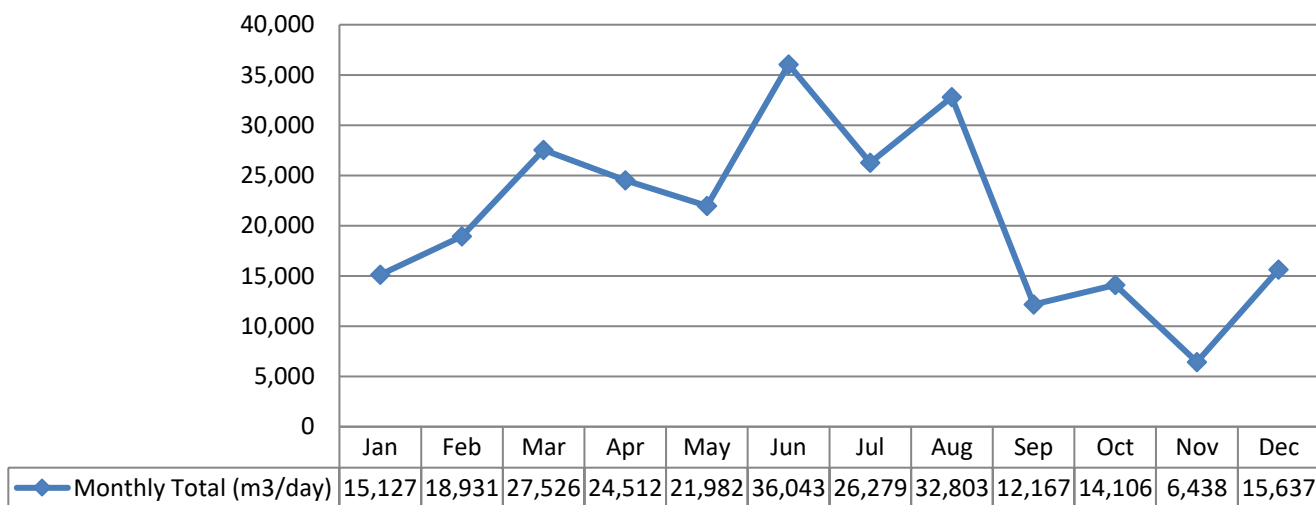
Graph 3 shows that the historical influent flows for the Omeme Sewage Lagoon from 2010 to 2020. Since 2017, the influent flows have decreased. The increased influent flow in 2017 can be attributed to the extremely wet spring season.

- b. Environmental Compliance Approval 2737-B4DH46 requires a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rate, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works.

The Performance Assessment Report (PAR) Wastewater/Lagoon is attached in **Appendix I**.

The following graphs provide final effluent flows for 2020 at the Omeme Sewage Lagoon. Final effluent is directed to the subsurface sewage disposal system during the winter months and to the spray irrigation system, typically during the warmer months, when all conditions were met.

**Graph 4: 2020 Effluent Monthly Flow Totals**



**Graph 5: 2020 Effluent Daily Minimum, Maximum and Average Flows**

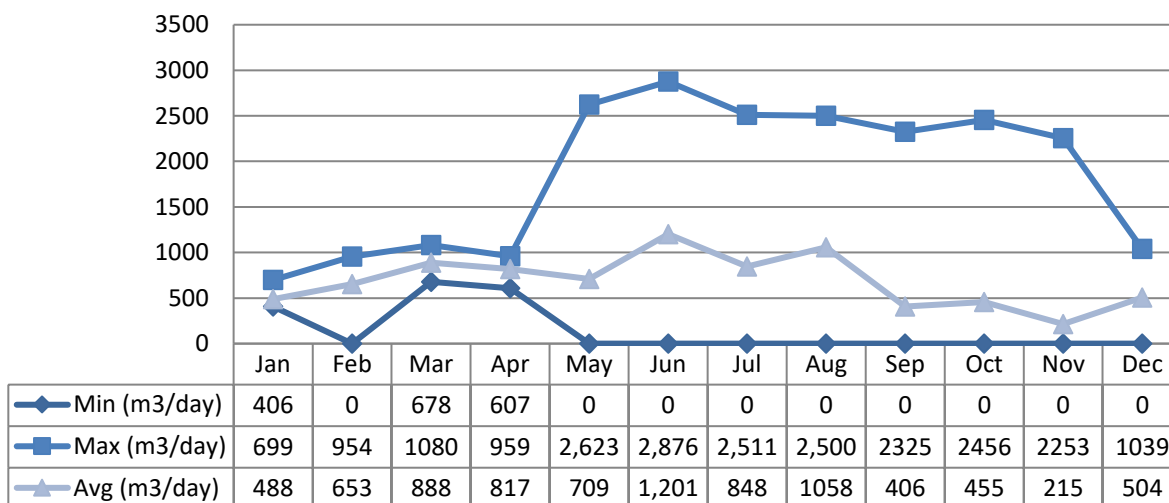


Table 2 outlines the effluent criteria limits as set out in Section 7(1), Schedule C of Environmental Compliance Approval Number 2737-B4DH46 as follows:

**Table 2: Omeme Sewage Lagoon - Final Effluent Compliance Limits - 2020**

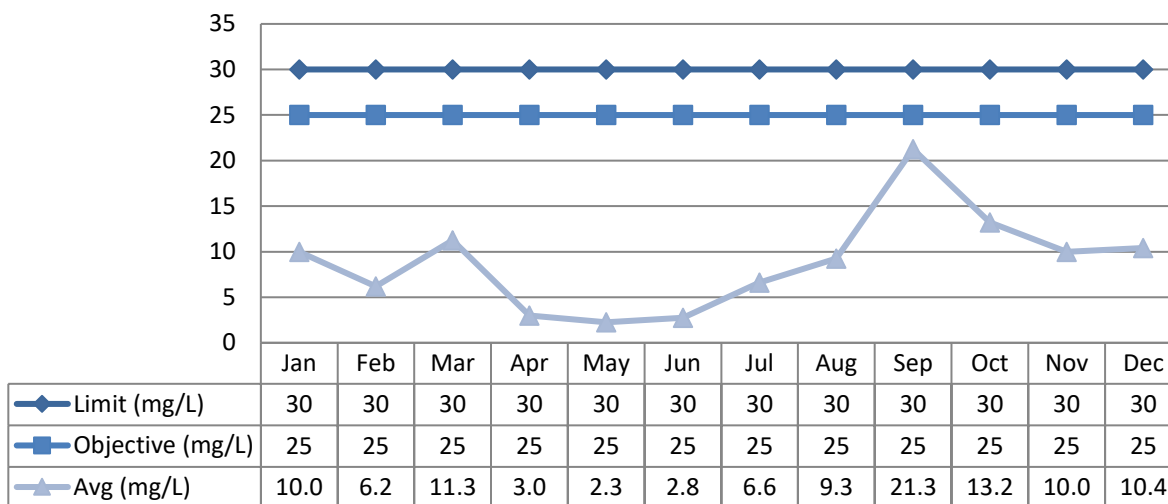
Effluent Parameters	Average Effluent Concentration Limit (mg/L)	Actual Monthly Average Effluent Concentration (mg/L)	Compliant (Y/N)
CBOD <sub>5</sub>	30.0	8.846	Y
Total Suspended Solids	40.0	13.458	*Y
Total Phosphorus	1.0	Annual Avg. = 0.221	Y

During the reporting period of 2020, the Omeme Sewage Lagoon final effluent generally met the compliance limits as prescribed in the Environmental Compliance Approval Number 2737-B4DH46. \*For the reporting period, the monthly average of Total Suspended Solids exceeded the limit in November 2020. This limit is 40.0 mg/L and the actual monthly effluent concentration was 40.75 mg/L. The contributing factor for the monthly TSS exceedance was the low effluent levels within the lagoons.

#### **Carbonaceous Biochemical Oxygen Demand (CBOD<sub>5</sub>)**

ECA Number 2737-B4DH46 (issued September 28, 2018) set the CBOD<sub>5</sub> monthly average concentration limit at 30.0 mg/L and the monthly average concentration objective at 25.0 mg/L. For 2020, the CBOD<sub>5</sub> monthly average concentration was 8.846 mg/L.

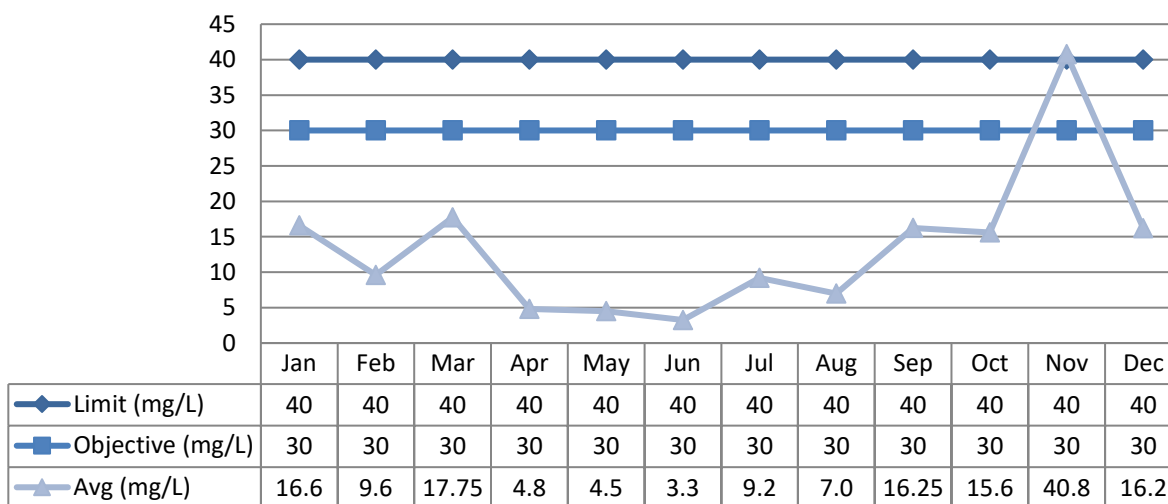
**Graph 6: 2020 Monthly CBOD<sub>5</sub> Final Effluent Concentration Comparisons**



**Total Suspended Solids (TSS)**

ECA Number 2737-B4DH46 set the Total Suspended Solids (TSS) monthly average concentration limit at 40.0 mg/L and the monthly average concentration objective at 30.0 mg/L. For 2020, the TSS monthly average concentration was 13.458 mg/L.

**Graph 7: 2020 Monthly TSS Final Effluent Concentration Comparisons**



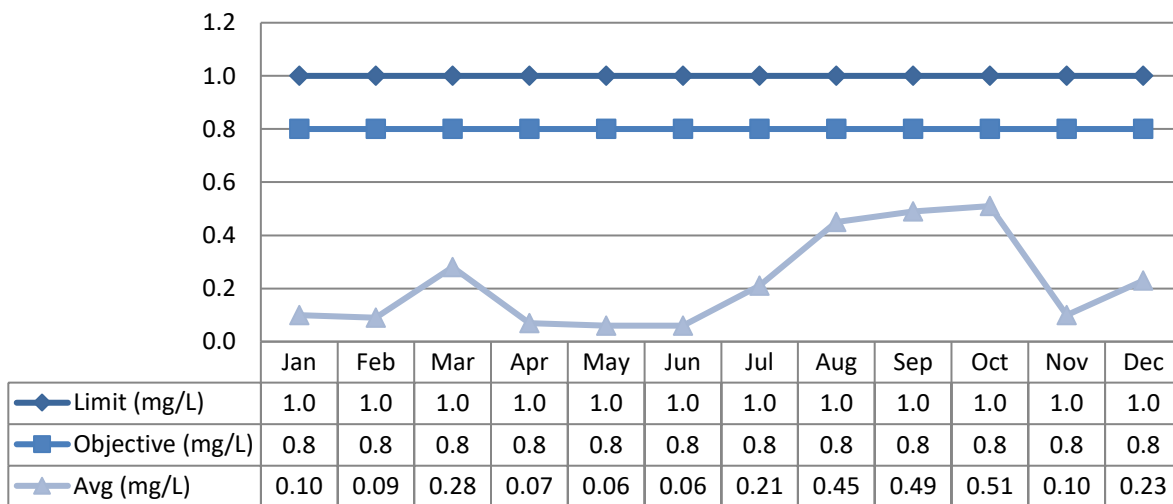
For the reporting period, the monthly average of Total Suspended Solids exceeded the limit in November 2020. This limit is 40.0 mg/L and the actual monthly effluent concentration was 40.75 mg/L. The contributing factor for the monthly TSS exceedance was the low effluent levels within the lagoons.

**Total Phosphorus (TP)**



ECA Number 2737-B4DH46 set the Total Phosphorus annual average concentration limit at 1.0 mg/L and the annual average concentration objective at 0.8 mg/L. For 2020, the Total Phosphorus annual average concentration was 0.221 mg/L.

**Graph 8: 2020 Annual Total Phosphorus Final Effluent Concentration Comparisons**



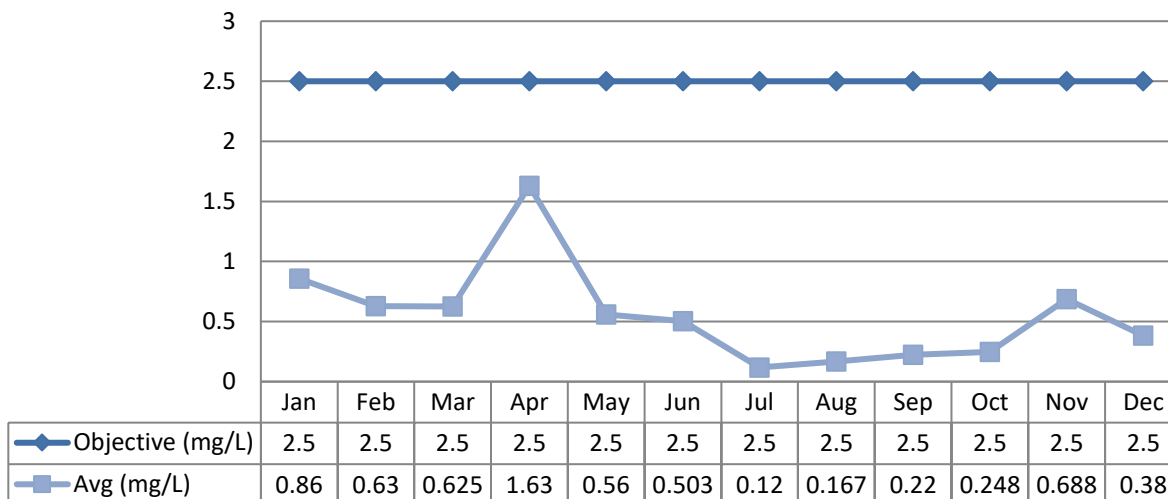
**Additional Parameter**

The following parameter was sampled as a requirement of ECA Number 2737-B4DH46. A monthly average concentration objective is indicated in the ECA but no monthly average concentration limit is indicated.

**Nitrite and Nitrate as Nitrogen**

ECA Number 2737-B4DH46 set the Nitrite and Nitrate as Nitrogen monthly average concentration objective at 2.5 mg/L. For 2020, the Nitrite and Nitrate as Nitrogen monthly average concentration was 0.57 mg/L.

**Graph 9: 2020 Monthly Nitrite and Nitrate as Nitrogen Final Effluent Concentration Comparison**



- c. a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting period.

The 2020 Omeme Sewage Lagoon Sampling Calendar was established and the sample day was Thursday. There were no deviations from the sample plan during the reporting period.

The Sample Plan for 2021 has been established and the sample day is on Friday. A copy of the 2021 Omeme Sewage Lagoon Sampling Calendar is included in **Appendix II**.

- d. a summary of all operating issues encountered and corrective actions taken.

The following details describe all operating problems encountered during the reporting period and the corrective actions taken.

**Table 3: 2020 Sewage Lagoon Operational Challenges**

Month	Challenges	Corrective Actions
February	Subsurface pump 2 failure, replacement	Replace pump 2
July	Spray irrigation system, multiple leaks	Repair leaks
November	Faulted flow meter 4	Replace meter 4 and calibrated
	Spray irrigation system, sprayer head failure	Overhaul sprayer head
December	Subsurface pump 4 failure, replacement	Replace pump 4

- e. a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works.

OCWA uses a Work Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out and assets are maintained to manufacturer's and/or industry standards. Emergency and capital repair maintenance is completed and added to the system.

Refer to **Appendix III: WMS Work order Summary**

- f. a summary of any effluent quality assurance or control measures undertaken.

Effluent quality assurance is maintained in several ways. All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis. SGS Lakefield Research has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis. Sampling calendars issued to the operators denoting frequency of sampling and these calendars are submitted to the Process Compliance Technician at the end of each month. Raw and effluent samples are collected as per the Environmental Compliance Approval and the results are reviewed on a regular basis to ensure compliance with the site's objectives and limits.

- g. a summary of the calibration and maintenance carried out on all Influent and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of the equipment as required in this Approval or recommended by the manufacturer.

Calibrations on influent and effluent monitoring equipment were performed by Franklin Empire in September 2020 for equipment located at the Sewage Lagoon and Sewage Pump Stations. Refer to **Appendix IV: Calibration Report**.

- h. a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
  - i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;

- ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;

The below listing provides the continuous efforts made to meet the Effluent Objectives at the Omemeo Sewage Lagoon.

### **Efforts Made to Meet the Effluent Objectives of Condition 6**

1. Sampling effluent as per the ECA.
2. Visual Inspection of the effluent while performing rounds and sampling.
3. Inspection of lagoon berms.
4. Inspection of subsurface disposal area.
5. Ensuring that Alum is being dosed.
6. Annual calibration of the flow meters.
7. Performing preventative maintenance activities in accordance with work order schedules.
8. Monitoring treatment processes through review of lab results.
9. Inspection of Sewage Pump Stations.
10. Visual Inspection of wet wells.
11. Inspection of spray irrigation system and fields.
12. Inspection of monitoring wells.

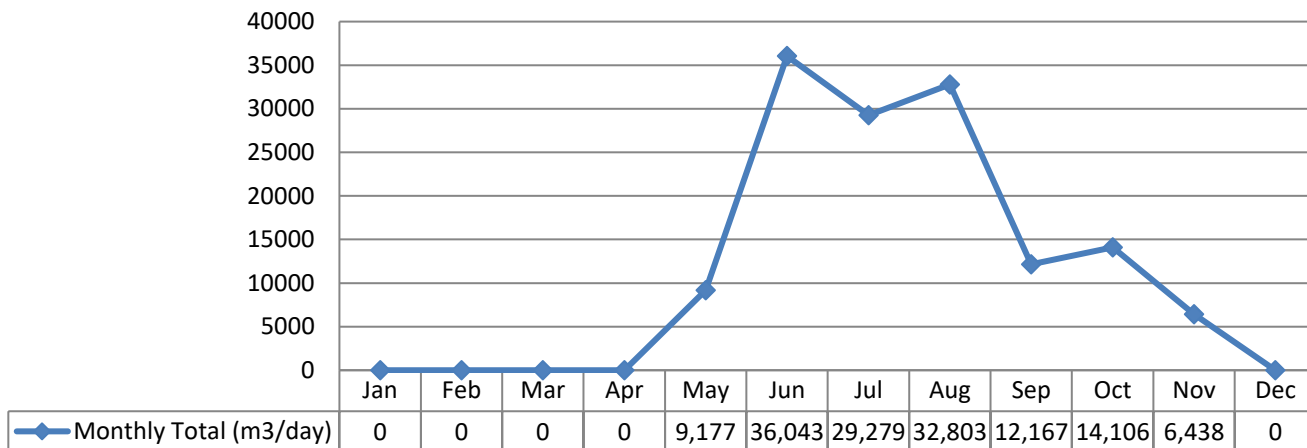
### **Additional Reporting Requirements:**

The spray irrigation system was in operation in 2020 under the authority of Provincial Officer's Order Number 1-L4E0C issued on May 8, 2019. ECA Number 2737-B4DH46 does not require any information pertaining to the spray irrigation be included in the Omemeo Sewage Lagoon annual performance report.

The spray irrigation system commenced operations on May 7, 2020. The spray irrigation system ceased operation on November 19, 2020 after the winterization process was completed. Notifications were provided to all stakeholders as required by the Provincial Officer's Order.

The following information has been included in this report as a substantial amount of final effluent was disposed of via spray irrigation in 2020.

### **Graph 10: 2020 Monthly Effluent Flow to Spray Irrigation System**



### Groundwater Monitoring Program

During the reporting period, ECA Number 2737-B4DH46, stipulates that the two (2) groundwater monitoring wells down-gradient of the subsurface disposal system and collect samples at the frequency specified, by means of the specified sample type and analyzed for each parameter outline in Schedule D. Each monitoring well was sampled or attempt made where the well was found to be dry, on a quarterly basis. The samples were analyzed for the parameters required. Please see attached **Appendix V: Monitoring Wells**, which provides the results of the two groundwater monitoring wells.

Additionally, as per Provincial Officer’s Order 1-L4E0C issued on May 8, 2019, an additional fifteen (15) groundwater monitoring wells were identified to be sampled on a quarterly basis, and analyzed for each parameter identified in the Order. Please see attached **Appendix V: Monitoring Wells**, which provides the results of these groundwater-monitoring wells.

### Sewage Pump Station (SPS) Capacity Assessments:

The Church St. SPS rated capacity of 64 L/s, which equals 5,530 m<sup>3</sup>/day. The maximum influent daily flow in 2020 was 1,074 m<sup>3</sup>, which does not exceed the SPS rated capacity.

**Table 4: 2020 Influent Flows at Church St. SPS**

Month	Max Daily Flow (m <sup>3</sup> /day)	Average Daily Flow (m <sup>3</sup> /day)
January	908	341.65
February	977	170.46
March	1074	393.92
April	328	245.94
May	264	168.35

Month	Max Daily Flow (m <sup>3</sup> /day)	Average Daily Flow (m <sup>3</sup> /day)
June	153	107.4
July	270	114.91
August	218.25	105.21
September	167.5	86.56
October	167.5	123.31
November	400	140.03
December	400	210.31

The Sturgeon St. SPS was upgraded under Environment Compliance Approval 6602-8X8FXB and the rated capacity of 122 L/s, which equals 10,500 m<sup>3</sup>/day. The maximum influent daily flow in 2020 was 2,629 m<sup>3</sup>, which does not exceed the raw rated capacity.

**Table 5: 2020 Influent Flows at Sturgeon St. SPS**

Month	Max Daily Flow (m <sup>3</sup> /day)	Average Daily Flow (m <sup>3</sup> /day)
January	2,291.7	947.09
February	730	501.73
March	2,629	1089.5
April	928	664.63
May	563	471.6
June	418.5	298.58
July	288	250.35
August	330	245.92
September	703	307.34
October	605.5	467.82
November	1,264	506.73
December	1,264	740.74

- i. an estimate of the volume of sludge in the lagoon cells. Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period.

During the reporting period a sludge survey was completed at the Omeme Sewage Lagoon. Please see attached **Appendix VI: Sludge Survey**, which provides the results of the sludge survey. During the reporting period, no sludge was disposed of from the Omeme Sewage Lagoon.

- i. a summary of any complaints received and any steps taken to address the complaints.

**Table 6: Complaints Received Summary for 2020**

<b>Date</b>	<b>Issue</b>	<b>Actions Taken</b>
May 28	Sewer backup	City checked sewer upstream and downstream of address and no issues found. Resident advised to contact a plumber.
July 21	Sewer odour	City spoke with resident and suggested that a plumber be contacted.

- k.** a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;

### **Bypasses**

There were no bypasses at the Omemeo Sewage Lagoon in 2020.

### **Overflows**

There were no overflows at the Omemeo Sewage Lagoon in 2020.

### **Situations outside Normal Operation Conditions**

Normal Operating Conditions was a new condition which became applicable to the Omemeo Sewage Lagoon with the issuance of ECA 2737-B4DH46 (September 28, 2018). All unit processes operated within their design capacity between January 1 and December 31, 2020.

### **Spills**

There were no spills at the Omemeo Sewage Lagoon in 2020.

### **Abnormal Discharge Events**

There were no abnormal discharge events at the Omemeo Sewage Lagoon in 2020.

- l.** a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.

There were no Notice of Modification to Sewage Works initiated, worked on or completed in 2020 for the Omemeo Sewage Lagoon.

- m.** a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system

that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted.

During the 2020 reporting period, there were no incidents of a bypass or overflow within the sanitary sewer system and therefore no proposed projects to eliminate bypasses or overflows are forecasted for the 2021 reporting period for the Omemeo Sewage Lagoon.