

Brechin/Lagoon City Sewage Treatment Plant

Annual Wastewater Performance Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2021

Issued: March 25, 2022

Revision: 0

Operating Authority:



Table of Contents

| | |
|---|--------|
| Background | 1 |
| Summary and Interpretation of Monitoring Data | |
| Summary of Influent Flow Data | 2 |
| Hydraulic Reserve Capacity..... | 3 |
| Description of Operating Problems Encountered..... | 8 |
| Summary of Maintenance | 10 |
| Summary of Effluent Quality Ensurance and Control Measures | 10, 11 |
| Summary of Calibration and Maintenance on Effluent Monitoring Equipment | 11 |
| Summary of Efforts Made and Results Achieved to Meet Effluent Objective | 11, 12 |
| Volume of Sludge Generated in Reporting Period | 16, 17 |
| Summary of Complaints Received during the Reporting Period..... | 17 |
| Summary of By-passes, Spills and Other Discharges..... | 17 |
| Status update on Initial Effluent Characterization | 17 |
| Any other information the District Manger Requires from time to time | 17 |

List of Tables

| | |
|-----------------|--|
| Table 1 | Historical Sewage Flows and Generation Rates |
| Table 2 | Minimum Raw Sewage Sampling Requirements |
| Table 3 | Minimum Effluent Sampling Requirements |
| Table 4 | 2021 Annual Average Concentration and Loading |
| Table 5 | Monthly Septage Volumes |
| Table 6 | Brechin Lagoon City WWTP Operational Challenges |
| Table 7 | Brechin/Lagoon City WWTP – Summary of Influent and Final Effluent Monitoring Equipment |
| Table 8 | Efforts Made to Meet the Effluent Objectives of Condition 9 |
| Table 9 | Monthly CBOD5 Final Effluent Concentration Objective Comparisons |
| Table 10 | Monthly TSS Final Effluent Concentration Objective Comparisons |
| Table 11 | Monthly TP Final Effluent Concentration Objective Comparisons |
| Table 12 | Monthly E. Coli Final Effluent Concentration Objective Comparisons |
| Table 13 | Monthly pH Final Effluent Concentration Objective Comparisons |
| Table 14 | Weekly Final Effluent pH, Temperature and Calculated Un-ionized Ammonia |
| Table 15 | Monthly Influent Sample Result Concentration Averages |
| Table 16 | Monthly Sludge Generation Volumes |
| Table 17 | Community Complaints |

Appendicies

| | |
|---------------------|---|
| Appendix I | Performance Assessment Report & Analytical and Process Data Reports |
| Appendix II | Annual Flow Meter Calibration Report |
| Appendix III | Biosolids Data Summary |

Background:

The Environmental Compliance Approval (ECA) No. 1114-745MQT issued on June 6th, 2007 was revoked and replaced by ECA No. 8497-8D3TU7 issued on June 28th, 2012. Condition 9 (5) in ECA No. 8497-8D3TU7 state the requirements for annual performance reports. The 2021 performance report has been prepared following the conditions of ECA No. 8497-8D3TU7, 9 (5). The Ontario Clean Water Agency was the operating authority during the reporting period January 1st-December 31st, 2021.

Environmental Certificate of Approval (ECA) No. 8497-8D3TU7 Section 9(5) requires the Performance Report to contain the following:

- a) Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage Works;*
- b) a description of any operating problems encountered and corrective actions taken;*
- c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;*
- d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;*
- e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment;*
- f) a description of efforts made and results achieved in meeting the Design Objectives of Condition 4;*
- g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;*
- h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;*
- i) a summary of all By-pass, spill or abnormal discharge events;*
- j) Status update of the initial effluent characterization as per Condition 8 subsection (1) until it has been completed and the required report has been submitted; and*
- k) any other information the District Manager requires from time to time; and*

This report will show that the Ontario Clean Water Agency has made every attempt to achieve its goals through its operational performance. This performance was enhanced through the use of an electronic process data collection database, an electronic maintenance and work order database, an electronic operational excellence database, a training program focused on providing the right skills to staff - also captured and tracked by the use of an electronic database and a multi-skilled, flexible workforce.

This report will show that the requirements of the facility ECA including effluent monitoring and reporting requirements were consistently met and that effluent quality was consistently within ECA requirements.

ECA No. 8497-8D3TU7 Condition 9(5)(a)

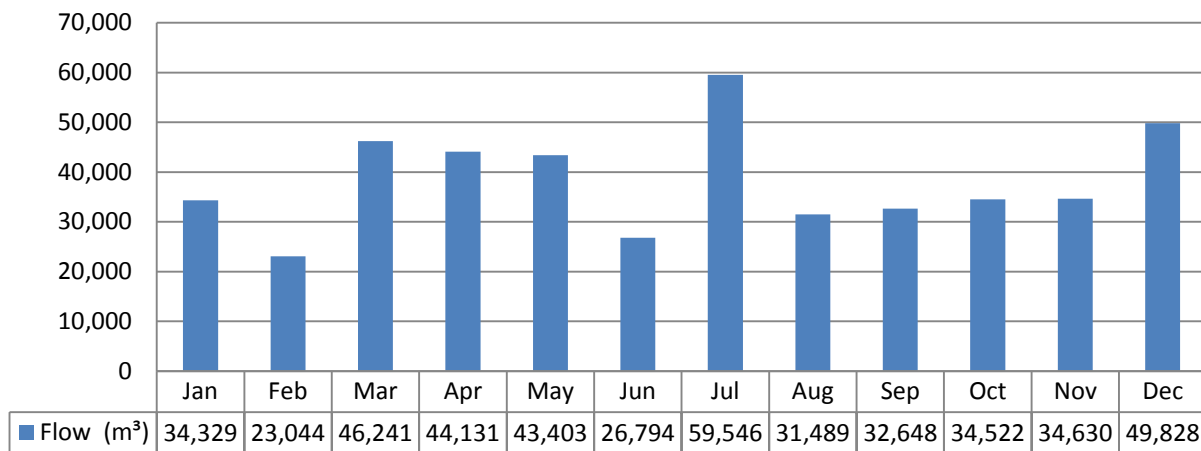
Summary of Influent Flow Data

Environmental Compliance Approval (ECA) No. 8497-8D3TU7, issued for the Brechin/Lagoon City WWTP Condition 9(5)(a) requires a Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage Works.

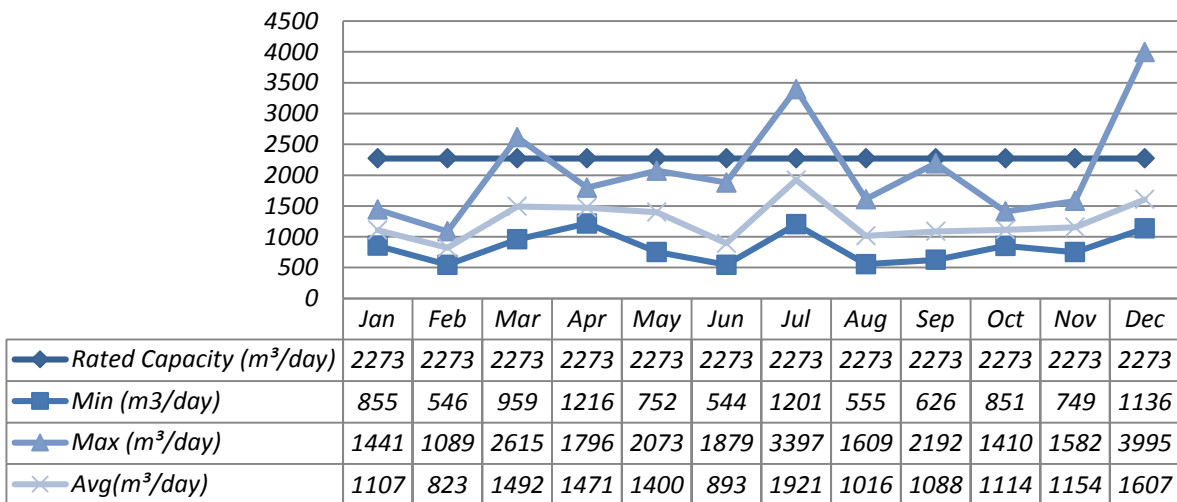
Condition 4(2)(b) of the (ECA) No. 8497-8D3TU7 indicates best efforts are to be made to operate at the rated capacity of the works. The rated capacity for the Brechin/Lagoon City Wastewater Treatment Plant is 2,273 m³/day and the annual average daily influent flow was 1,257.20 m³/day or 55.3 % of the rated capacity.

The total Influent flow in 2021 was 460 604.04 m³

Graph 1: 2021 Influent Flow Monthly Totals



Graph 2: Influent Daily Minimum, Maximum and Average Flows



Note: The above table shows exceedances in maximum flows during March, July and December. The spikes in flows were due to weather events/snowmelt in correlation with significant inflow and infiltration during these weather events. However, the average daily flow for the works was below the rated capacity.

Brechin Lagoon City Sewage Works Historical Flows

Table 1: Historical Sewage Flows and Generation Rates

| Year | Number of Connections | Equivalent Population* | Average Daily Flow (m ³ /day) | Maximum Daily Flow (m ³ /day) | Rated Capacity (m ³ /day) | Sewage Generation Rate (L/cap/day) |
|----------------|-----------------------|------------------------|--|--|--------------------------------------|------------------------------------|
| 2012 | 1158 | 2405 | 1138 | 2915 | 2273 | 473 |
| 2013 | 1159 | 2408 | 1341 | 3204 | 2273 | 557 |
| 2014 | 1159 | 2414 | 1641 | 5094 | 2273 | 681 |
| 2015 | 1162 | 2414 | 1262 | 3313 | 2273 | 523 |
| 2016 | 1165 | 2420 | 1255 | 4735 | 2273 | 517 |
| 2017 | 1170 | 2431 | 1566 | 4213 | 2273 | 644 |
| 2018 | 1174 | 2439 | 1430 | 4260 | 2273 | 586 |
| 2019 | 1175 | 2441 | 1481 | 3686 | 2273 | 607 |
| 2020 | 1179 | 2650 | 1393 | 3462 | 2273 | 526 |
| 2021 | 1179 | 2650 | 1257 | 3995 | 2273 | 474 |
| 3 Year Average | | 2650 | 1377 | 3995 | 2273 | 536 |

*Based on estimated service connections in Lagoon City and Brechin: 1,125 and 154 single family dwellings. The estimated population in Lagoon City: 2,250 (based on a population density of 2.0 persons per dwelling), and the estimated population in Brechin: 400 (based on a population density of 2.6 persons per dwelling). Assumptions made on location of new developments for 2021 connections for population estimation.

Note: This calculation was completed based on current connections in the system, growth within the collection system has not been considered.

Note: Typically, the system is well under the design capacity, significant inflow and infiltration during wet weather events skew the reserve capacity results.

Hydraulic Reserve Capacity

In accordance with the MECP Procedure D-5-1, the reserve capacity is calculated by the following formula:
 Hydraulic Reserve Capacity= Design Flow- Committed Flow

The design flow is equal to the maximum permissible flow approved by the Amended Environmental Compliance Approval. (ECA) No. 8497-8D3TU7 maximum permissible flow is: 2273 m³/day. The committed flow is equal to the total expected flow by the existing and proposed connections based on the previous 3-year average daily flow.

The built-out service area of the Brechin/Lagoon City Sewage Works has a total of 1269 units. The three-year (2019-2021) average sewage generation rate is: 536 L/cap/day. With the current population of 2650 there is a projection of 1420 m³/day of committed sewage flow. The estimated hydraulic reserve capacity for the Brechin Lagoon City Sewage Works in 2021 is 853 m³/day.

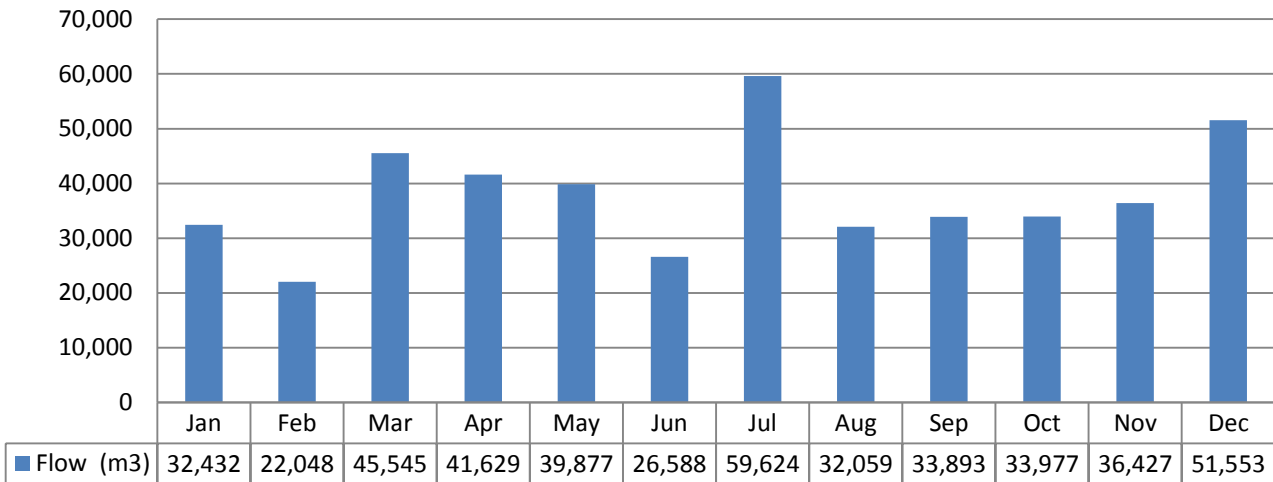
Summary of Effluent Flow Data

Environmental Compliance Approval (ECA) No. 8497-8D3TU7, issued for the Brechin/Lagoon City WWTP Condition 9(5)(a) requires a Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage Works.

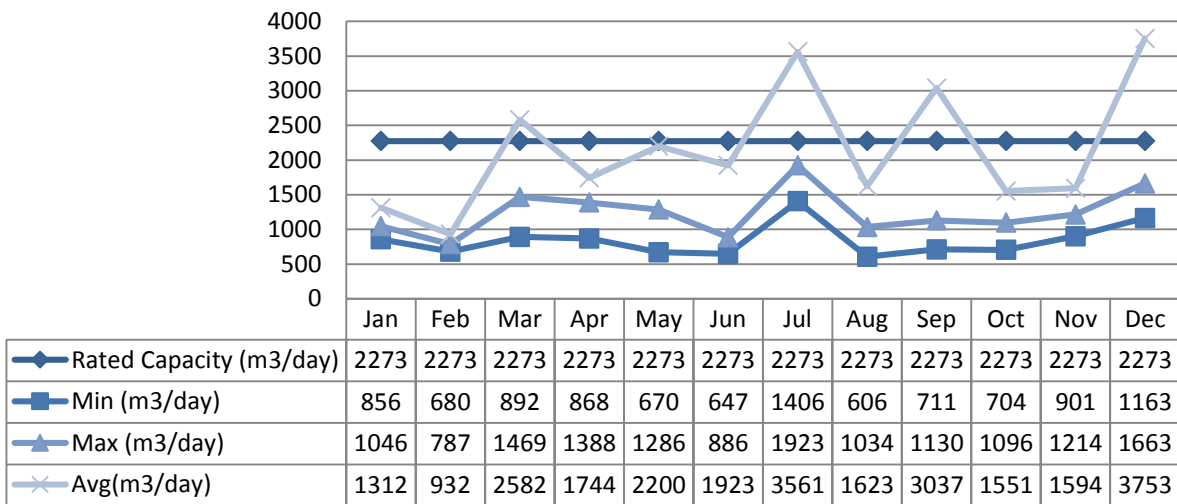
Condition 4(2)(b) of the (ECA) No. 8497-8D3TU7 indicates best efforts are to be made to operate at the rated capacity of the works. The rated capacity for the Brechin/Lagoon City Wastewater Treatment Plant is 2,273 m³/day and the annual average daily effluent flow was 1,243.63 m³/day or 54.7 % of the rated capacity

The total effluent flow in 2021 was 455 652 m³

Graph 3: 2021 Effluent Flow Monthly Totals



Graph 4: Effluent Daily Minimum, Maximum and Average Flows



Note: The above table shows exceedances in maximum flows during March, July, September and December. The spikes in flows were due to weather events/snowmelt in correlation with significant inflow and infiltration during these weather events. However, the average daily flow for the works was below the rated capacity.

Summary of Sampling Frequency

ECA No. 8497-8D3TU7 Condition 7(3) describes the requirement for sample collection at the following locations, frequencies and by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 2: Minimum Raw Sewage Sampling Requirements

| Influent Sampling Point | | |
|-------------------------|--------------------------|-----------|
| Parameters | Sample Type | Frequency |
| BOD5 | 8 Hour Daytime Composite | Monthly |
| Total Suspended Solids | 8 Hour Daytime Composite | Monthly |
| Total Phosphorus | 8 Hour Daytime Composite | Monthly |
| Total Kjeldahl Nitrogen | 8 Hour Daytime Composite | Monthly |

Table 3: Minimum Effluent Sampling Requirements

| Final Effluent Sampling Point | | |
|-------------------------------|-------------------|-----------|
| Parameters | Sample Type | Frequency |
| CBOD5 | 24-Hour Composite | Weekly |
| Total Suspended Solids | 24-Hour Composite | Weekly |
| Total Phosphorus | 24-Hour Composite | Weekly |
| Total Ammonia Nitrogen | 24-Hour Composite | Weekly |
| Nitrates | 24-Hour Composite | Weekly |
| pH | Grab/Probe | Weekly |
| Temperature | Grab/Probe | Weekly |
| E. coli | Grab | Weekly |

Final Effluent Parameter Summary

The following tables provide a summary of the monitoring data for the Brechin/Lagoon City WWTP compared to the effluent limits and Objectives outlined in Condition 4 and 5 of ECA No. 8497-8D3TU7.

A summary of the Final Effluent and Raw Sewage monitoring data is contained in Appendix I of this report.

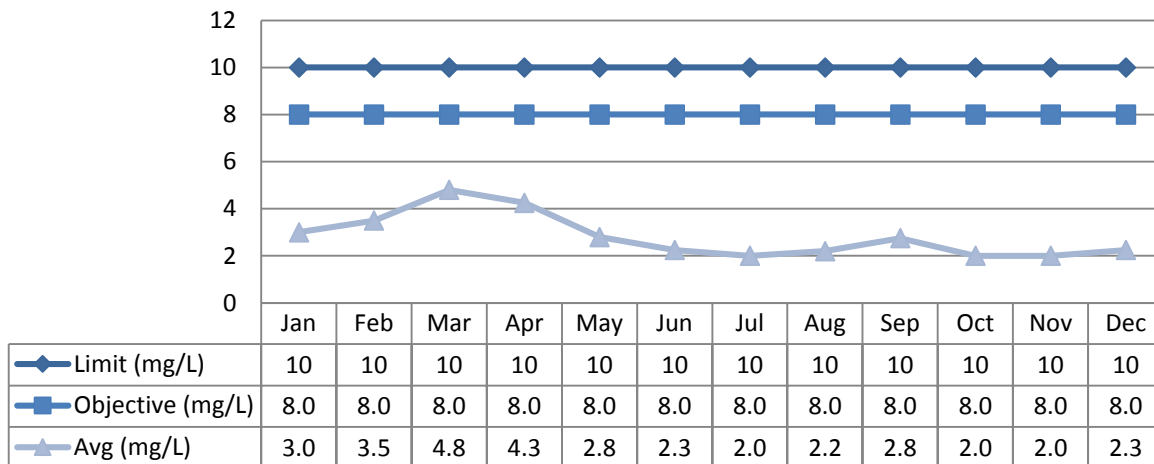
Carbonaceous Biochemical Oxygen Demand (CBOD5)

ECA No. 8497-8D3TU7 sets the CBOD5 monthly average concentration limit at 10.00 mg/L and the objective at 8.0 mg/L. The monthly CBOD5 average concentration results throughout 2021 were in compliance with the limits and objectives outlined in ECA No. 8497-8D3TU7.

CBOD5 Monthly Average Concentration

The monthly CBOD5 average concentration limit and monthly concentration objective were met each month in 2021.

Graph 5: 2021 Monthly CBOD5 Final Effluent Concentration Comparisons



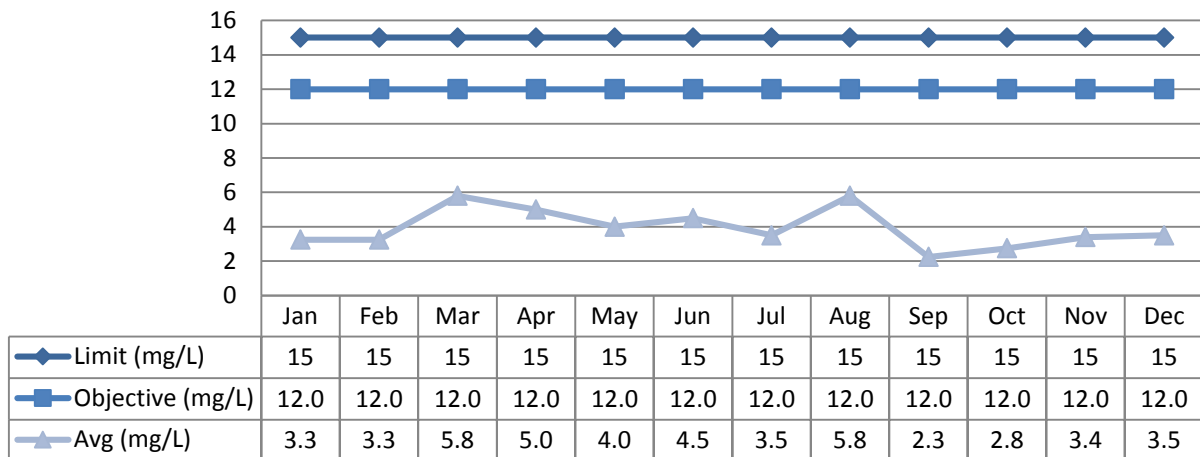
Total Suspended Solids (TSS)

ECA No. 8497-8D3TU7 sets the TSS annual monthly concentration limit at 15.0 mg/L and the objective at 12.0 mg/L. The monthly Total Suspended Solids average concentration results throughout 2021 were in compliance with the limits and objectives outlined in ECA No. 8497-8D3TU7.

Total Suspended Solids Monthly Average Concentration

The monthly Total Suspended Solids monthly average concentration limit and monthly concentration objective were met each month in 2021.

Graph 6: 2021 Monthly TSS Final Effluent Concentration Comparisons



Total Phosphorus (TP)

ECA No. 8497-8D3TU7 sets the TP monthly concentration limit at 0.30 mg/L and the annual average waste loading at 249 kg/year. The monthly Total Phosphorus average concentration results and annual average waste loading results throughout 2021 were in compliance with the limits and objectives outlined in ECA No. 8497-8D3TU7.

Condition 5(2) of ECA No. 8497-8D3TU7 lists the Lake Simcoe Phosphorus Reduction Strategy effluent limits. These limits are set at an annual average concentration of 0.15 mg/L and annual average loading of 124 kg/Year.

Total Phosphorus Monthly Average Concentration

The monthly Total Phosphorus monthly average concentration limit and monthly concentration objective were met each month in 2021.

Graph 7: 2021 Monthly Total Phosphorus Final Effluent Concentration Limit Comparisons

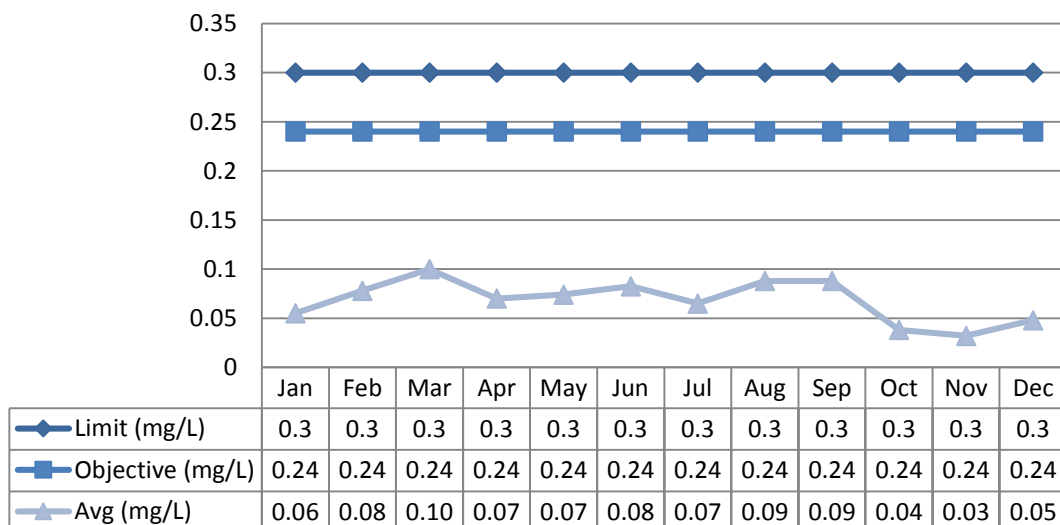


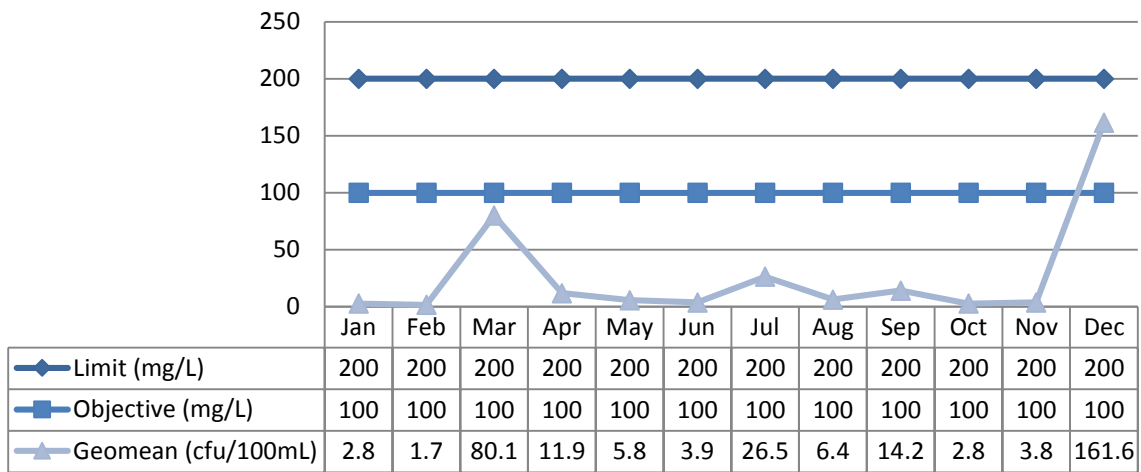
Table 4: 2021 Annual Average Concentration and Loading

| Parameters | 2021 Annual Average Concentration (mg/L) | Lake Simcoe Annual Average Concentration Limit /Objective | 2021 Annual Average Loading (Kg/year) | Annual Loading Limit (Kg/year) | Lake Simcoe Annual Concentration Limit/Objective (mg/L) | Compliant (Y/N) |
|------------------|--|---|---------------------------------------|--------------------------------|---|-----------------|
| Total Phosphorus | 0.07 | 0.15 | 30.82 | 249 | 124 | Yes |

E. Coli

ECA No. 8497-8D3TU7 sets the monthly geometric mean density of E. Coli at 200 cfu/100mL and an objective of 100 cfu/100ml. The monthly geomean limit was met each month in 2021. The monthly geomean objective was met every month in 2021 with the exception of December. Due to wet weather events and subsequently high flows in December the geometric mean is higher.

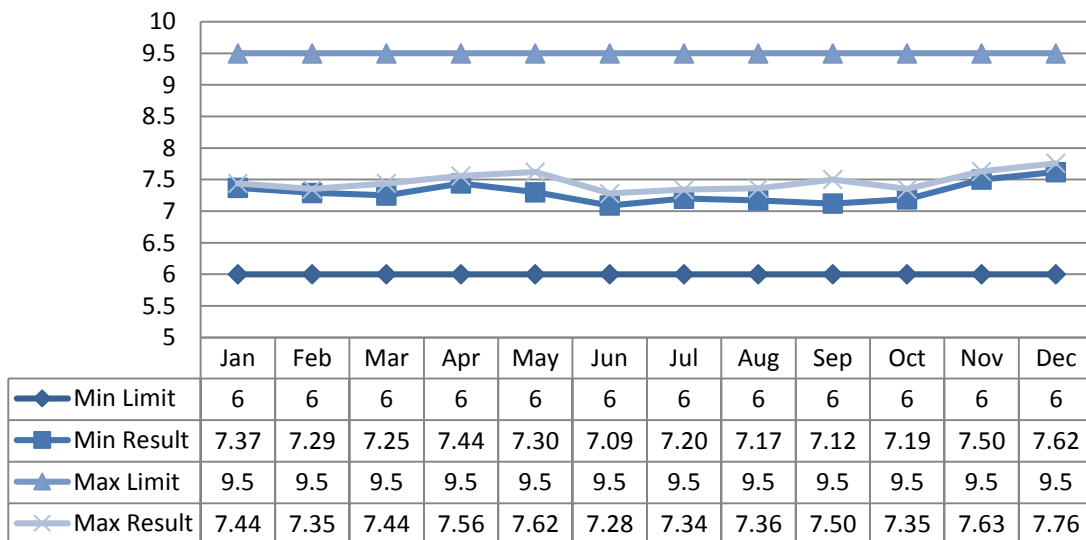
Graph 9: 2021 Monthly E. Coli Final Effluent Geometric Mean Comparisons



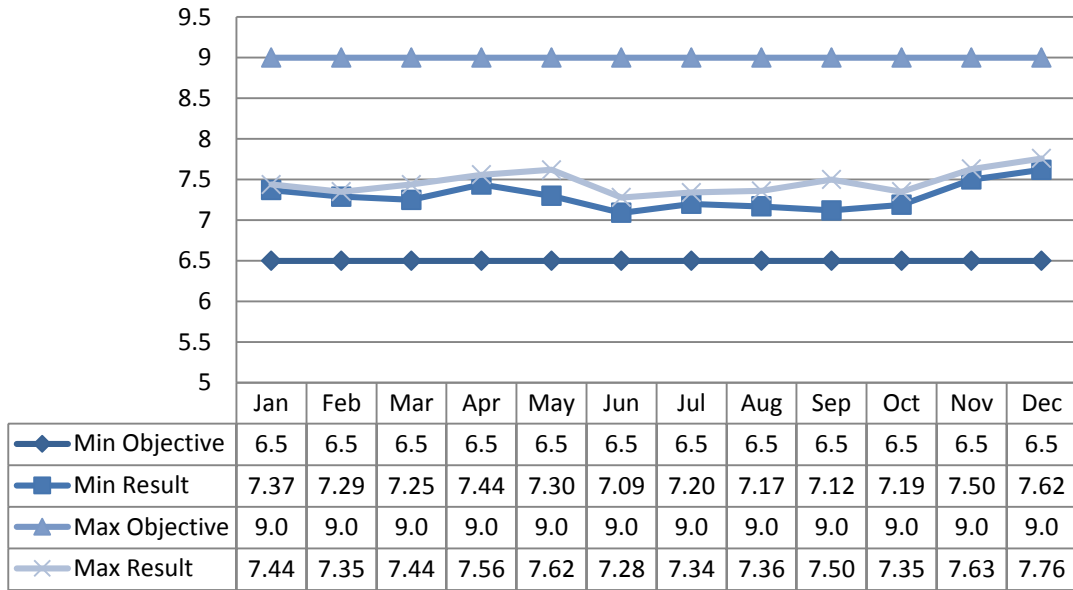
pH

ECA No. 8497-8D3TU7 has a pH compliance limit within the range of 6.0 to 9.5 and an objective within the range of 6.5-9.0, inclusive, at all times. The pH of the final effluent ranged from 7.09-7.76 throughout 2021 which is within the ECA compliance limit at all times.

Graph 10: 2021 Monthly pH Final Effluent Concentration Limit Comparisons



Graph 11: 2021 Monthly pH Final Effluent Concentration Objectives Comparisons



Summary of Septage Received

The Brechin/Lagoon City Wastewater Treatment Plant accepts septage from licensed haulers. See Table 4 for summary of volumes received in 2021.

Table 5: Monthly Septage Volumes

| Month | Volume (m ³) |
|--------------|--------------------------|
| January | 14.38 |
| February | 28.39 |
| March | 7.95 |
| April | 40.50 |
| May | 21.20 |
| June | 76.47 |
| July | 51.92 |
| August | 57.92 |
| September | 47.32 |
| October | 66.24 |
| November | N/A |
| December | N/A |
| Total | 412.23 |

ECA No. 8497-8D3TU7 Condition 9(5)(b) – Description of Operating Problems

ECA #8497-8D3TU7_Condition 9(5)(b) states that the annual performance report shall contain "a description of any operating problems encountered and corrective actions taken."

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

Table 6: Brechin Lagoon City WWTP Operational Challenges

| Month | Challenges | Corrective Actions |
|------------------|---|--|
| February | Aerator Fault. | Repair aerator 2C. |
| | Alum Storage. | New bulk alum tank installed. New alum tank commissioned in March 2021. |
| April | Pumping Station #2 pump blockage. | Remove pump and clear debris. |
| May | Pumping Station #2 pump blockage. | Remove pump and clear debris. |
| | Blower Fault. | Refurbish Blower #3. |
| | Aerator fault. | Replace Aerator 2C, replace damaged aerator cables. |
| June | Digester piping break. | Repair Digester piping and valves. |
| July | Pumping Station #2 Communication Error. | Contractor contacted to repair. |
| | High basin level due to heavy rain event. | Plant monitored, screw speed increased, siphons unblocked. |
| | Decant challenges. | Contractor replaced valve on digester #1 lower decant. |
| | Aerators failures. | 1 Aerator replaced with spare. Both aerators with faults pulled to be serviced. |
| August | Pumping Station #4- Generator Fault. | Battery Replaced. |
| | Pumping Station #2 Blockage. | Pull pumps and clear blockage. |
| September | Pumping Station #2- Communication Error. | Switched to running station off of miltronic mode, monitored. |
| | Pumping Station #2- Pump Blockages. | Contractor onsite to clear blockages. |
| | Chemical Feed System Failure, due to broken line. | Check valves replaced, replace lines. |
| | Aerator failure. | Contractor replaced blown fuses, increase overload. |
| | Pumping Station #8- Flow Meter failure. | Breaker reset. |
| October | Polymer chemical pump failed. | Replaced failed pump with spare. |
| | Pumping Station #2- Pump Blockage. | Contractor onsite to remove blockage, test pump. |
| November | Polymer pump failure. | Replace with spare pump. |
| December | High flows due to wet weather, Basin level float failure. | Plant monitored, siphons cleared, digital level sensor installed and tied to SCADA and alarms. |

ECA No. 8497-8D3TU7 Condition 9(5)(c) – Summary of Maintenance

ECA No. 8497-8D3TU7 Condition 11(4)(e) states that the annual performance report shall contain *summary of all maintenance carried out on any major structure, equipment, apparatus or mechanism forming part of the Works.*"

Routine maintenance and operation of the Brechin/Lagoon City Wastewater Treatment Plant and Sewage Pumping Stations in 2021 consisted of the following:

- Adjusted chemical dosages
- Adjusted the speed of the screw conveyor to match incoming flows
- Attended to Hydro failures
- Blew out and restarted return activated sludge siphons
- Changed the oil in the digester blowers
- Cleaned secondary clarifiers
- Collected samples as per the ECA
- Conducted settleability tests of the MLSS
- Decanted the digesters to aeration basin
- De-iced mechanical aerators
- Exercised generators
- Flushed chemical pumps and lines
- Greased bearings of screw conveyor
- Observed speciation of microorganisms in MLSS with a microscope
- Mixed polymer solutions
- Performed routine maintenance and repair of pumps
- Pulled and cleaned or replaced UV bulbs
- Repair and replace aerator
- Respond to emergency alarms
- Wasted sludge as required to maintain appropriate MLSS concentration

ECA No. 8497-8D3TU7 Condition 9(4)(d) – Summary of Effluent Quality Assurance or Control Measures Undertaken

ECA No. 8497-8D3TU7 Condition 9(4)(d) states that the annual performance report shall contain *"a summary of effluent quality assurance or control measures undertaken in the reporting period."*

Effluent control measures include in-house sampling and testing for operational parameters such as suspended solids, soluble phosphorus, and dissolved oxygen. In-house testing provides real time results which are then evaluated to determine if process changes are necessary to enhance operational performance. All in-house sampling and analysis are performed by certified operations staff utilizing approved methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

All final effluent samples collected during the reporting period to meet ECA sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis, with the exception of pH, temperature and unionized ammonia. 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. The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained. The unionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility Environmental Compliance Approval.

Effluent quality assurance is maintained in several ways. Laboratory samples are sent to an accredited laboratory (SGS Canada Inc. - Lakefield) for analysis of all effluent parameters. Sampling calendars issued to the operator which denote frequency of sampling. Calendars are used as a tracking mechanism throughout the month to ensure all required samples are collected. These calendars are submitted to the Process Compliance Technician at the end of each month for review. Raw and effluent samples are collected as per the Amended Environmental Compliance Approval and the results are reviewed on a regular basis to ensure compliance with the site’s objectives and limits.

Work orders illustrating all scheduled and preventative maintenance to be completed are issued to the operator and/or mechanic. OCWA conducts internal audits of the facility and develops Action Plans to ensure deficiencies are identified.

ECA No. 8497-8D3TU7 Condition 9(4)(e) – Summary of Calibration and Maintenance

ECA No. 8497-8D3TU7 Condition 9(4)(e) states that the annual performance report shall contain *"a summary of the calibration and maintenance carried out on all effluent monitoring equipment."*

Calibrations on effluent monitoring equipment were performed by Flowmetrix Technical Services Inc. on June 08, 2021 for equipment located at the Brechin/ Lagoon City Wastewater Treatment Plant. Please see Appendix II: Calibration Report.

| Table 7: Brechin/Lagoon City WWTP – Summary of Influent and Final Effluent Monitoring Equipment – 2021 | |
|---|--------------------|
| Collection Monitoring Equipment | Date of Completion |
| Pump Station #4 Flow Meter | June 08, 2021 |
| Pump Station #8 Flow Meter | June 08, 2021 |
| Influent Monitoring Equipment | Date of Completion |
| Influent Flow Meter | June 08, 2021 |
| Final Effluent Monitoring Equipment | Date of completion |
| Final Effluent Flow Meter | June 08, 2021 |
| Online pH meter | June 08, 2021 |

ECA No. 8497-8D3TU7 Condition 9(4)(f) – Description of Efforts Made

OCWA uses a number of best efforts to achieve the Effluent Objectives. Effluent quality assurance and control measures include in-house sampling and testing for operational parameters such as suspended solids, phosphorus, dissolved oxygen, etc. In-house testing provides real time results which are then used to enhance process and operational performance. OCWA also collects raw sewage and effluent samples as per the ECA and reviews these results on a regular basis to ensure compliance with the ECA objectives and limits.

OCWA uses a computerized maintenance management system which generates work orders to ensure maintenance of equipment is proactively performed. In addition, OCWA provides regular status reports to the Owner which includes operational data, equipment inventory, financial statements, maintenance activities and capital improvement recommendations.

OCWA has developed comprehensive manuals detailing operations, maintenance, instrumentation and emergency procedures. To ensure facilities are operated in compliance with applicable legal requirements, facility staff have access to a network of operational compliance and support experts at the cluster, region and corporate level.

Table 8: Efforts Made to Meet the Effluent Objectives of Condition 9

| |
|---|
| 1. Sampling effluent as per the ECA. |
| 2. Visual Inspection of the effluent while performing rounds. |
| 3. Annual calibration of the pH meter. |
| 4. Annual calibration of the flow meters. |
| 5. Performing preventative maintenance activities in accordance with work order schedules. |
| 6. Monitoring treatment processes through regular in-house checks and review of lab results. |
| 7. Sludge monitoring of primary clarifiers & adjustments to pumping volume based on tank levels to reduce solids carryover to the secondary clarifiers. |
| 8. Increase dissolved oxygen (DO) set point to aerations tanks to help with filamentous control. |
| 9. Visual review of microbiological activity of activated sludge to ensure appropriate F/M ratio and control filamentous. |

The Brechin/Lagoon City WWTP was able to consistently meet the Effluent Objectives throughout 2021 with the exception of one sample collected in December 2021, which effected the E. Coli geometric mean.

Carbonaceous Biochemical Oxygen Demand (CBOD5)

ECA No. 8497-8D3TU7 sets the CBOD5 monthly average concentration objective at 8.0 mg/L.

Table 9: Monthly CBOD5 Final Effluent Concentration Objective Comparisons

| Monthly Average | Average Concentration (mg/L) | Concentration Objective Target (mg/L) | Objective Achieved |
|-----------------|------------------------------|---------------------------------------|--------------------|
| January | 3.0 | 8.0 | Yes |
| February | 3.5 | 8.0 | Yes |
| March | 4.8 | 8.0 | Yes |
| April | 4.3 | 8.0 | Yes |
| May | 2.8 | 8.0 | Yes |
| June | 2.3 | 8.0 | Yes |
| July | 2.0 | 8.0 | Yes |
| August | 2.2 | 8.0 | Yes |
| September | 2.8 | 8.0 | Yes |
| October | 2.0 | 8.0 | Yes |
| November | 2.0 | 8.0 | Yes |
| December | 2.3 | 8.0 | Yes |

Total Suspended Solids (TSS)

ECA No. 8497-8D3TU7 sets the TSS monthly average concentration objective at 12.0 mg/L.

Table 10: Monthly TSS Final Effluent Concentration Objective Comparisons

| Month | Average Concentration (mg/L) | Concentration Objective Target (mg/L) | Objective Achieved |
|--------------|-------------------------------------|--|---------------------------|
| January | 3.3 | 12.0 | Yes |
| February | 3.3 | 12.0 | Yes |
| March | 5.8 | 12.0 | Yes |
| April | 5.0 | 12.0 | Yes |
| May | 4.0 | 12.0 | Yes |
| June | 4.5 | 12.0 | Yes |
| July | 3.5 | 12.0 | Yes |
| August | 5.8 | 12.0 | Yes |
| September | 2.3 | 12.0 | Yes |
| October | 2.8 | 12.0 | Yes |
| November | 3.4 | 12.0 | Yes |
| December | 3.5 | 12.0 | Yes |

Total Phosphorus (TP)

ECA No. 8497-8D3TU7 sets the TP monthly average concentration objective at 0.24 mg/L.

Table 11: Monthly TP Final Effluent Concentration Objective Comparisons

| Month | Average Concentration (mg/L) | Concentration Objective Target (mg/L) | Objective Achieved |
|--------------|-------------------------------------|--|---------------------------|
| January | 0.06 | 0.24 | Yes |
| February | 0.08 | 0.24 | Yes |
| March | 0.10 | 0.24 | Yes |
| April | 0.07 | 0.24 | Yes |
| May | 0.07 | 0.24 | Yes |
| June | 0.08 | 0.24 | Yes |
| July | 0.07 | 0.24 | Yes |
| August | 0.09 | 0.24 | Yes |
| September | 0.09 | 0.24 | Yes |
| October | 0.04 | 0.24 | Yes |
| November | 0.03 | 0.24 | Yes |
| December | 0.05 | 0.24 | Yes |

E.Coli

ECA No. 8497-8D3TU7 sets the monthly E. Coli geometric mean objective at 100 cfu/100mL. Due to wet weather events subsequently causing high flows during December 2021 the geometric mean is higher.

Table 12: Monthly E. Coli Final Effluent Concentration Objective Comparisons

| Month | Geometric Mean (cfu/100mL) | Concentration Objective Target (cfu/100mL) | Objective Achieved |
|-----------|----------------------------|--|--------------------|
| January | 2.83 | 100 | Yes |
| February | 1.68 | 100 | Yes |
| March | 80.07 | 100 | Yes |
| April | 11.92 | 100 | Yes |
| May | 5.81 | 100 | Yes |
| June | 3.87 | 100 | Yes |
| July | 26.48 | 100 | Yes |
| August | 6.38 | 100 | Yes |
| September | 14.17 | 100 | Yes |
| October | 2.83 | 100 | Yes |
| November | 3.78 | 100 | Yes |
| December | 161.56 | 100 | No |

pH

The pH of the effluent ranged from 6.66– 8.25 throughout 2021 which is within the ECA design objectives of 6.50 to 9.00, inclusive, at all times.

Table 13: Monthly pH Final Effluent Concentration Objective Comparisons

| Month | Minimum | Maximum |
|-----------|---------|---------|
| January | 7.37 | 7.44 |
| February | 7.29 | 7.35 |
| March | 7.25 | 7.44 |
| April | 7.44 | 7.56 |
| May | 7.30 | 7.62 |
| June | 7.09 | 7.28 |
| July | 7.20 | 7.34 |
| August | 7.17 | 7.36 |
| September | 7.12 | 7.50 |
| October | 7.19 | 7.35 |
| November | 7.50 | 7.63 |
| December | 7.62 | 7.76 |

Unionized Ammonia

Unionized ammonia has an objective of 0.1mg/L (100 ug/L). Using total ammonia nitrogen, along with field pH and temperature, the following are the results for the monthly calculated unionized ammonia averages. The final unionized ammonia average was less than the objective each month.

Table 14: Weekly Final Effluent pH, Temperature and Calculated Un-ionized Ammonia

| Date | Total Ammonia Nitrogen: NH ₃ + NH ₄ ⁺ as N [mg/L] | Field pH | Field temp 'C | Un-ionized Ammonia |
|------------|--|----------|---------------|--------------------|
| 01/07/2021 | 0.1 | 7.44 | 7.7 | 0.0004 |
| 01/12/2021 | 0.7 | 7.4 | 6.5 | 0.0025 |
| 01/18/2021 | 0.3 | 7.39 | 7.1 | 0.0011 |
| 01/25/2021 | 3.7 | 7.37 | 4.8 | 0.0106 |
| 02/03/2021 | 5.4 | 7.35 | 3.7 | 0.0136 |
| 02/08/2021 | 4.6 | 7.3 | 3.6 | 0.0102 |
| 02/16/2021 | 8.1 | 7.33 | 3.6 | 0.0193 |
| 02/22/2021 | 7.3 | 7.29 | 5 | 0.0177 |
| 03/01/2021 | 5.2 | 7.25 | 6.6 | 0.0131 |
| 03/09/2021 | 4.7 | 7.35 | 5.4 | 0.0135 |
| 03/15/2021 | 6.1 | 7.4 | 5.5 | 0.0199 |
| 03/22/2021 | 8.2 | 7.41 | 7.8 | 0.0329 |
| 03/29/2021 | 5.4 | 7.44 | 7.8 | 0.0232 |
| 04/06/2021 | 6.4 | 7.44 | 9 | 0.0302 |
| 04/13/2021 | 2.5 | 7.44 | 11.4 | 0.0142 |
| 04/20/2021 | 0.7 | 7.49 | 10 | 0.0040 |
| 04/27/2021 | 0.2 | 7.56 | 9.1 | 0.0013 |
| 05/03/2021 | 1.0 | 7.53 | 10.6 | 0.0066 |
| 05/13/2021 | 0.1 | 7.62 | 11.4 | 0.0009 |
| 05/17/2021 | 2.8 | 7.44 | 13.9 | 0.0193 |
| 05/25/2021 | 3.0 | 7.3 | 16.3 | 0.0180 |
| 05/31/2021 | 0.1 | 7.4 | 14.6 | 0.0007 |
| 06/07/2021 | 0.4 | 7.28 | 19.7 | 0.0029 |
| 06/16/2021 | 0.2 | 7.09 | 17.8 | 0.0008 |
| 06/21/2021 | 1.1 | 7.09 | 19.7 | 0.0052 |
| 06/28/2021 | 1.3 | 7.14 | 19.9 | 0.0070 |
| 07/07/2021 | 0.4 | 7.2 | 20.2 | 0.0025 |
| 07/12/2021 | 0.3 | 7.27 | 18.2 | 0.0019 |
| 07/19/2021 | 0.3 | 7.29 | 19.5 | 0.0022 |
| 07/26/2021 | 0.1 | 7.34 | 19.6 | 0.0008 |
| 08/03/2021 | 0.1 | 7.36 | 18.4 | 0.0008 |
| 08/11/2021 | 0.1 | 7.31 | 22.4 | 0.0010 |
| 08/16/2021 | 0.2 | 7.22 | 19.2 | 0.0012 |
| 08/23/2021 | 0.2 | 7.17 | 22.7 | 0.0014 |
| 08/30/2021 | 0.1 | 7.15 | 22.6 | 0.0007 |
| 09/07/2021 | 0.7 | 7.12 | 19.6 | 0.0035 |
| 09/14/2021 | 0.1 | 7.27 | 19.2 | 0.0007 |
| 09/20/2021 | 0.1 | 7.32 | 18.1 | 0.0007 |
| 09/27/2021 | 0.1 | 7.5 | 17.6 | 0.0010 |

| | | | | |
|------------|-----|------|------|--------|
| 10/06/2021 | 0.1 | 7.35 | 18 | 0.0008 |
| 10/12/2021 | 0.1 | 7.19 | 18.9 | 0.0006 |
| 10/18/2021 | 0.1 | 7.28 | 16 | 0.0006 |
| 10/25/2021 | 0.2 | 7.3 | 14.5 | 0.0010 |
| 11/03/2021 | 0.1 | 7.53 | 12.7 | 0.0008 |
| 11/08/2021 | 0.1 | 7.5 | 12.5 | 0.0007 |
| 11/15/2021 | 0.1 | 7.5 | 11.2 | 0.0006 |
| 11/22/2021 | 0.1 | 7.63 | 10.9 | 0.0008 |
| 11/29/2021 | 0.1 | 7.7 | 9.4 | 0.0009 |
| 12/07/2021 | 0.1 | 7.69 | 8.5 | 0.0008 |
| 12/14/2021 | 0.2 | 7.7 | 9.8 | 0.0018 |
| 12/20/2021 | 2 | 7.76 | 7.2 | 0.0170 |
| 12/29/2021 | 0.2 | 7.62 | 7.7 | 0.0013 |

Temperature

The final effluent temperature ranged from 3.6°C to 22.7°C.

Additional Parameters

The parameters listed below are collected as per ECA or regulatory requirements or for process optimization.

Influent Samples

Influent sampling is completed in order to make the necessary process adjustments to stay within the Final Effluent Objectives and limits set in the ECA.

Table 15: Monthly Influent Sample Result Concentration Averages

| Month | Biochemical Oxygen Demand - BOD5 (mg/L) | Total Suspended Solids – TSS (mg/L) | Total Kjeldahl Nitrogen – TKN (mg/L) | Total Phosphorus – TP (mg/L) |
|------------------|--|--|---|-------------------------------------|
| January | 71.0 | 77.0 | 15.4 | 1.47 |
| February | 50.0 | 118.0 | 11.0 | 1.42 |
| March | 88.0 | 87.0 | 22.7 | 2.07 |
| April | 93.0 | 73.0 | 15.3 | 1.38 |
| May | 89.0 | 64.0 | 16.7 | 1.62 |
| June | 51.0 | 51.0 | 12.0 | 1.08 |
| July | 75.0 | 75.0 | 10.2 | 1.04 |
| August | 21.0 | 21.0 | 14.0 | 0.95 |
| September | 103.0 | 103.0 | 17.5 | 1.97 |
| October | 143.0 | 143.0 | 20.2 | 2.04 |
| November | 101.0 | 101.0 | 21.2 | 1.58 |
| December | 59.00 | 59.0 | 6.8 | 0.64 |

ECA No. 8497-8D3TU7 Condition 9(5)(g) – Summary of Biosolids

The total volume of sludge generated in 2021 was 990 m³ which was slightly lower than the amount of sludge generated in 2020. Wessuc Inc. has been contracted to haul, land apply the Biosolids on their approved sites. Monthly sludge sampled are collected to tested for metals listed in the Ontario Guidelines for Sewage Biosolids

Utilization on Agricultural Lands. There is enough storage to store sludge at the Brechin/ Lagoon City WWTP for the rest of the year.

Table 16: Monthly Sludge Generation Volumes

| Month | Volume (m ³) |
|--------------|--------------------------|
| January | N/A |
| February | N/A |
| March | N/A |
| April | 360 |
| May | N/A |
| June | N/A |
| July | N/A |
| August | N/A |
| September | 270 |
| October | 360 |
| November | N/A |
| December | N/A |
| Total | 990 |

The anticipated volume of biosolids for the next reporting period is not expected to be significantly different from this reporting period. There are no expected changes in the current sludge handling methods that are currently utilized. Refer to Appendix III: Biosolids Summary

ECA #8497-8D3TU7 Condition 9(5)(h) – Community Complaints

ECA #8497-8D3TU7 (5)(h) states that the annual performance report shall contain: “a summary of any complaints received and any steps taken to address the complaints.” Refer to Table 17 below for summary.

Table 17: Community Complaints Summary

| Date | Issue | Actions Taken |
|----------------|-------------------------------|--|
| March 03, 2021 | Blocked private sewer lateral | Operator investigated, resident advised to contact plumber |
| May 26, 2021 | Plugged Sewer | Operator investigated, resident advised to contact plumber |

ECA #8497-8D3TU7 Condition 9(5)(i) – Summary of all Bypass, Spill or Abnormal Discharge Events

During the 2021 reporting period there was no Bypasses, spills and abnormal discharge events.

ECA #8497-8D3TU7 Condition 9(5)(j) – Status Update of the Initial Effluent Characterization as per Condition 8 subsection (1) until it has been completed and the required report has been submitted.

The initial effluent characterization was submitted as per Condition 8 Section (1). No updates occurred during the reporting period.

ECA #8497-8D3TU7 Condition 9(5)(k)- any other information the District Manager requires from time to time.

The District Manager has not requested any additional information be included in this report.

Appendix I

Performance Assessment Report

**Ontario Clean Water Agency
 Performance Assessment Report Wastewater/Lagoon**

| | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 | Dec-21 | <--Total--> | <--Avg--> | <--Max--> | <--Criteria--> |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|-----------|-----------|----------------|
| Flows: | | | | | | | | | | | | | | | | |
| Raw Flow: Total - Raw (m³) | 34328.50 | 23044.30 | 46241.00 | 44131.20 | 43402.60 | 26793.60 | 59546.40 | 31489.20 | 32647.60 | 34522.00 | 34629.70 | 49827.94 | 460604.04 | | | |
| Raw Flow: Avg - Raw (m³/d) | 1107.37 | 823.01 | 1491.65 | 1471.04 | 1400.08 | 893.12 | 1920.85 | 1015.78 | 1088.25 | 1113.61 | 1154.32 | 1607.35 | | 1257.20 | | 2273.0 |
| Raw Flow: Max - Raw (m³/d) | 1441.40 | 1089.10 | 2615.10 | 1795.50 | 2072.80 | 1879.10 | 3397.10 | 1609.00 | 2192.40 | 1410.10 | 1581.70 | 3995.00 | | | 3995.00 | |
| Eff. Flow: Total - Final Effluent (m³) | 32432.00 | 22048.00 | 45545.00 | 41629.00 | 39877.00 | 26588.00 | 59624.00 | 32059.00 | 33893.00 | 33977.00 | 36427.00 | 51553.00 | 455652.00 | | | |
| Eff. Flow: Avg - Final Effluent (m³/d) | 1046.19 | 787.43 | 1469.19 | 1387.63 | 1286.35 | 886.27 | 1923.35 | 1034.16 | 1129.77 | 1096.03 | 1214.23 | 1663.00 | | 1243.63 | | |
| Eff. Flow: Max - Final Effluent (m³/d) | 1312.00 | 932.00 | 2582.00 | 1744.00 | 2200.00 | 1923.00 | 3561.00 | 1623.00 | 3037.00 | 1551.00 | 1594.00 | 3753.00 | | | 3753.00 | |
| Carbonaceous Biochemical Oxygen Demand: CBOD: | | | | | | | | | | | | | | | | |
| Eff: Avg cBOD5 - Final Effluent (mg/L) | 3 | 3.500 | 4.800 | 4.25 | 2.800 | 2.250 | 2.000 | 2.200 | 2.750 | 2.000 | 2.000 | 2.250 | | 2.817 | 4.800 | 10.0 |
| Eff: # of samples of cBOD5 - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Loading: cBOD5 - Final Effluent (kg/d) | 3.139 | 2.756 | 7.052 | 5.897 | 3.602 | 1.994 | 3.847 | 2.275 | 3.107 | 2.192 | 2.428 | 3.742 | | 3.503 | 7.052 | |
| Biochemical Oxygen Demand: BOD5: | | | | | | | | | | | | | | | | |
| Raw: Avg BOD5 - Raw (mg/L) | 71.000 | 50.000 | 88.000 | 93.000 | 89.000 | 51.000 | 75.000 | 21.000 | 103.000 | 143.000 | 101.000 | 59.000 | | 78.667 | 143.000 | |
| Raw: # of samples of BOD5 - Raw (mg/L) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | | | |
| Total Suspended Solids: TSS: | | | | | | | | | | | | | | | | |
| Raw: Avg TSS - Raw (mg/L) | 77.000 | 118.000 | 87.000 | 73.000 | 64.000 | 51.000 | 119.000 | 42.000 | 128.000 | 89.000 | 76.000 | 84.000 | | 84.000 | 128.000 | |
| Raw: # of samples of TSS - Raw (mg/L) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | | | |
| Eff: Avg TSS - Final Effluent (mg/L) | 3.250 | 3.250 | 5.800 | 5.000 | 4.000 | 4.500 | 3.500 | 5.800 | 2.250 | 2.750 | 3.400 | 3.500 | | 3.917 | 5.800 | 15.0 |
| Eff: # of samples of TSS - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Loading: TSS - Final Effluent (kg/d) | 3.400 | 2.559 | 8.521 | 6.938 | 5.145 | 3.988 | 6.732 | 5.998 | 2.542 | 3.014 | 4.128 | 5.821 | | 4.899 | 8.521 | |
| Total Phosphorus: TP: | | | | | | | | | | | | | | | | |
| Raw: Avg TP - Raw (mg/L) | 1.470 | 1.420 | 2.070 | 1.380 | 1.620 | 1.080 | 1.040 | 0.950 | 1.970 | 2.040 | 1.580 | 0.640 | | 1.438 | 2.070 | |
| Raw: # of samples of TP - Raw (mg/L) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | | | |
| Eff: Avg TP - Final Effluent (mg/L) | 0.055 | 0.078 | 0.100 | 0.070 | 0.074 | 0.083 | 0.065 | 0.092 | 0.088 | 0.038 | 0.032 | 0.048 | | 0.068 | 0.100 | 0.3 |
| Eff: # of samples of TP - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Loading: TP - Final Effluent (kg/d) | 0.058 | 0.061 | 0.147 | 0.097 | 0.095 | 0.073 | 0.125 | 0.095 | 0.099 | 0.041 | 0.039 | 0.079 | | 0.084 | 0.147 | |
| Nitrogen Series: | | | | | | | | | | | | | | | | |
| Raw: Avg TKN - Raw (mg/L) | 15.400 | 11.000 | 22.700 | 15.300 | 16.700 | 12.000 | 10.200 | 14.000 | 17.500 | 20.200 | 21.200 | 6.800 | | 15.250 | 22.700 | |
| Raw: # of samples of TKN - Raw (mg/L) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | | | |
| Eff: Avg TAN - Final Effluent (mg/L) | 1.200 | 6.350 | 5.920 | 2.450 | 1.400 | 0.750 | 0.275 | 0.140 | 0.250 | 0.125 | 0.100 | 0.625 | | 1.632 | 6.350 | |
| Eff: # of samples of TAN - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Loading: TAN - Final Effluent (kg/d) | 1.255 | 5.000 | 8.698 | 3.400 | 1.801 | 0.665 | 0.529 | 0.145 | 0.282 | 0.137 | 0.121 | 1.039 | | 1.923 | 8.698 | |
| Eff: Avg NO3-N - Final Effluent (mg/L) | 9.785 | 10.415 | 5.994 | 6.563 | 12.228 | 17.600 | 11.103 | 18.360 | 16.450 | 15.800 | 11.478 | 7.933 | | 11.976 | 18.360 | |
| Eff: # of samples of NO3-N - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Eff: Avg NO2-N - Final Effluent (mg/L) | 3.258 | 1.858 | 1.306 | 3.330 | 1.158 | 0.467 | 0.173 | 0.442 | 0.523 | 0.168 | 0.460 | 0.785 | | 1.161 | 3.330 | |
| Eff: # of samples of NO2-N - Final Effluent (mg/L) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |
| Disinfection: | | | | | | | | | | | | | | | | |
| Eff: GMD E. Coli - Final Effluent (cfu/100mL) | 2.828 | 1.682 | 80.071 | 11.916 | 5.811 | 3.869 | 26.479 | 6.379 | 14.170 | 2.828 | 3.776 | 161.557 | | 26.781 | 161.557 | 200.0 |
| Eff: # of samples of E. Coli - Final Effluent (cfu/100mL) | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 52 | | | |

Appendix II

Calibration Reports



AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL

CUSTOMER OCWA – Kawartha Lakes Hub
CONTACT Nick Leroux
Senior Operations Manager
123 East St S
Bobcaygeon ON, K0M 1A0
P: 705-623-7278
E: nleroux@ocwa.com

EQUIPMENT DETAIL

[MUT] MANUFACTURER Rosemount
MODEL 8712
CONVERTER SERIAL NUMBER 08060245142

PLANT ID Lagoon City STP
METER ID Final Effluent Flow
FIT ID NA
CLIENT TAG NA
OTHER NA
GPS COORDINATES N 44°33.467 W 079°12.436

VERIFICATION DATE June 8th 2021
CAL. FREQUENCY Annual
CAL. DUE DATE June 2022

VER. BY - FM Michael Jorin

Quality Management Standards Information -
Reference equipment and instrumentation used
to conduct this verification test is found in our AC-
QMS document at the time this test was

PROGRAMMING PARAMETERS

DIAMETER (DN) mm 300
F.S. FLOW - MAG LPS 859.000
F.S. RANGE - O/P LPS 600.000
TUBE CAL. FACTOR 1108905010807005

FORWARD TOTALIZER INFORMATION

AS FOUND 887602 M3
AS LEFT 887706 M3
DIFFERENCE 104 M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST Yes
FORWARD FLOW DIRECTION Yes
ALLOWABLE [%] ERROR 5

COMPONENTS TESTED

CONVERTER DISPLAY yes
mA OUTPUT yes
TOTALIZER yes
ACCURACY BASED ON [% o.r.] yes
ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

VERIFICATOR CAL. FACTOR 1000015010000000
[16-digits]

FLOW TUBE SIMULATION

| | 0 | 3 | 10 | 30 | ft/s |
|-------------------|-------|-------|-------|---------|---------|
| DISPLAY | 0.00 | 3.00 | 10.00 | 30.00 | ft/s |
| MUT Reading | 0.00 | 3.00 | 10.00 | 30.00 | ft/s |
| MUT % Error | n/a | 0.00 | 0.00 | 0.00 | % |
| mA OUTPUT | 4.000 | 5.600 | 9.333 | 20.000 | mA |
| MUT Reading | 4.000 | 5.601 | 9.344 | 19.998 | mA |
| MUT % Error | 0.00 | 0.02 | 0.11 | -0.01 | % |
| TOTALIZER | | | | 30.00 | ft/s |
| TEST Accumulation | | | | 3000.01 | ft |
| TIME | | | | 98.12 | seconds |
| CALC. Velocity | | | | 30.57 | ft/s |
| % Error | | | | 1.92 | % |

QUALITY MANAGEMENT STANDARDS INFO.

| [QMS] INFORMATION | IDENT. | ID # |
|-------------------|--------|------|
| [REFERENCE] FTS | ROS | 1 |
| PROCESS METER | PM | 12 |
| ANALOG METER | AM | n/a |
| STOP WATCH | SW | Yes |

*All values are for "As Found" values.

COMMENTS

| RESULTS | | |
|-----------|------------|-----------|
| TEST | AVG % o.r. | PASS FAIL |
| DISPLAY | 0.00 | PASS |
| mA OUTPUT | 0.04 | PASS |
| TOTALIZER | 1.92 | PASS |

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER OCWA – Kawartha Lakes Hub
CONTACT Nick Leroux
Senior Operations Manager
123 East St S
Bobcaygeon ON, K0M 1A0
P: 705-623-7278
E: nleroux@ocwa.com

EQUIPMENT DETAIL

[MUT] MANUFACTURER Greyline
MODEL OCF-IV
CONVERTER SERIAL NUMBER 17849

PLANT ID Lagoon City
METER ID Influent Flow
FIT ID NA
CLIENT TAG NA
OTHER NA
GPS COORDINATES N 44°33.467 W 079°12.436

VERIFICATION DATE June 8th 2021
CAL. FREQUENCY Annual
CAL. DUE DATE June 2022

VER. BY - FM Michael Jorin

Quality Management Standards Information -
Reference equipment and instrumentation used
to conduct this verification test is found in our AC-

PROGRAMMING PARAMETERS

| | | |
|-----------------------------|--------|-------|
| NOTCH ANGLE (φ) | inches | 45 |
| EMPTY DISTANCE, TX to notch | m | 0.662 |
| TRANSDUCER (TX), to sump fl | m | 0.78 |
| SUMP LEVEL, zero flow | m | 0.118 |
| | | 5* |
| MAX. HEAD | m | 0.300 |
| BLANKING DISTANCE | m | 0.362 |
| DEAD ZONE | m | 0.000 |
| MAX. FLOW | M3/H | 101.4 |
| F.S. RANGE - O/P | M3/H | 101.4 |

| | |
|------------------|-----------|
| TOTALIZER | |
| AS FOUND | 114946 M3 |
| AS LEFT | 114956 M3 |
| DIFFERENCE | 10 M3 |

| | |
|-----------------------------|-----|
| TEST CRITERIA | |
| AS FOUND CERTIFICATION TEST | Yes |
| ALLOWABLE [%] ERROR | 15 |

COMPONENTS TESTED

| | |
|----------------------------|-----|
| CONVERTER DISPLAY | yes |
| mA OUTPUT | yes |
| TOTALIZER | yes |
| ACCURACY BASED ON [% o.r.] | yes |

Ultrasonic Sensor is not installed high enough, to ensure full scale flow conditions

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

AS FOUND TEST RESULTS

| | | 0.0 | 0.4 | 31.9 | 63.4 | 100.0 | % F.S. Range |
|-----------------------------------|----------------|--------------|--------------|--------------|---------------|----------------|--------------|
| | | 0.000 | 0.032 | 0.190 | 0.250 | 0.300 | m |
| REF. FLOW RATE | | 0.0 | 0.4 | 32.4 | 64.3 | 101.4 | M3/H |
| MUT [Reading] | | 0.0 | 0.4 | 31.1 | 65.2 | 97.8 | M3/H |
| MUT [Difference] | | 0.0 | 0.0 | -1.3 | 0.9 | -3.6 | M3/H |
| MUT [% Error] | | 0.0 | -1.8 | -3.9 | 1.4 | -3.6 | % |
| mA OUTPUT | | 4.000 | 4.059 | 9.107 | 14.143 | 20.000 | mA |
| MUT [Reading] | min. 4.000 mA | 4.000 | 4.053 | 9.055 | 14.450 | 19.587 | mA |
| MUT [Difference] | max. 20.000 mA | 0.000 | -0.006 | -0.052 | 0.307 | -0.413 | mA |
| MUT [% Error] | | 0.00 | -0.16 | -0.58 | 2.17 | -2.07 | % |
| TOTALIZER - REF. FLOW RATE | | | | | | 101.402 | M3/H |
| TOTALIZER [MUT] | | | | | | 2 | M3 |
| TEST TIME | | | | | | 75.06 | SECONDS |
| CALC. TOTALIZER | | | | | | 2.114 | M3 |
| ERROR | | | | | | -5.71 | % |

COMMENTS

-Results based on Internal Simulation not actual flow.
-Head Level was verified with a 1 point live flowrate.

QUALITY MANAGEMENT STANDARDS INFO.

| [QMS] INFORMATION | IDENT. | ID # |
|-------------------|------------|------|
| [REFERENCE] LEVEL | Sim. BOARD | n/a |
| PROCESS METER | PM | 2 |
| STOP WATCH | SW | n/a |

RESULTS

| TEST | AVG % o.r. | PASS FAIL |
|-----------|------------|-----------|
| DISPLAY | -1.98 | PASS |
| mA OUTPUT | -0.13 | PASS |
| TOTALIZER | -5.71 | PASS |

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

| CLIENT DETAIL | | EQUIPMENT DETAIL | |
|---|---|--------------------|--------------------------|
| CUSTOMER | OCWA – Kawartha Lakes Hub | [MUT] MANUFACTURER | Krohne |
| CONTACT | Nick Leroux Senior Operations Manager 123 East St S Bobcaygeon ON, K0M 1A0 P: 705-623-7278 E: nleroux@ocwa.com | MODEL | IFC 300 |
| | | SERIAL NUMBER | A08 03059 |
| | | FUSE | Lighting Panel #14 |
| | | PLANT ID | Brechin Community Park |
| | | METER ID | Pump Station #08 |
| | | FIT ID | N/A |
| | | CLIENT TAG | N/A |
| | | OTHER | N/A |
| | | GPS COORDINATES | N 44°32.760 W 079°10.769 |
| VER. BY - FM | Michael Jorin | VERIFICATION DATE | June 8th 2021 |
| Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was | | CAL. FREQUENCY | Annual |
| | | CAL. DUE DATE | June, 2022 |

| PROGRAMMING PARAMETERS | | | FORWARD TOTALIZER INFORMATION | | |
|------------------------|-----|---------|--|----------|----|
| DIAMETER (DN) | mm | 150 | AS FOUND | 581483.2 | M3 |
| F.S. FLOW - MAG | LPS | 160.1 | AS LEFT | 581489.3 | M3 |
| F.S. RANGE - O/P | LPS | 60.000 | DIFFERENCE | 6.1 | M3 |
| CAL. k-FACTOR | GK | 2.97280 | | | |
| | | | TEST CRITERIA | | |
| | | | AS FOUND CERTIFICATION TEST | Yes | |
| | | | FORWARD FLOW DIRECTION | Yes | |
| | | | ALLOWABLE [%] ERROR | 15 | |
| | | | COMPONENTS TESTED | | |
| | | | CONVERTER DISPLAY | yes | |
| | | | mA OUTPUT | yes | |
| | | | TOTALIZER | Yes | |
| | | | ACCURACY BASED ON [% o.r.] | yes | |
| | | | ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r. | | |
| Zero Offset Flow | LPS | 0.0000 | | | |

FLOW TUBE SIMULATION

| | | 0.0 | 0.5 | 1.0 | 2.0 | m/s |
|-----------------------------------|----------------|--------------|--------------|--------------|---------------|--------------|
| | | 0.0 | 5.0 | 10.0 | 20.0 | % F.S. Flow |
| | | 0.0 | 13.3 | 26.7 | 53.4 | % F.S. Range |
| REF. FLOW RATE | | 0.000 | 8.01 | 16.01 | 32.02 | LPS |
| MUT [Reading] | | 0.004 | 7.9 | 15.9 | 32.0 | LPS |
| MUT [Difference] | | 0.004 | -0.095 | -0.104 | -0.027 | LPS |
| MUT [% Error] | | n/a | -1.19 | -0.65 | -0.08 | % |
| mA OUTPUT | | 4.000 | 6.135 | 8.270 | 12.540 | mA |
| MUT [Reading] | min. 4.000 mA | 4.000 | 6.131 | 8.255 | 12.453 | mA |
| MUT [Difference] | max. 20.000 mA | 0.000 | -0.004 | -0.015 | -0.087 | mA |
| MUT [% Error] | | 0.00 | -0.06 | -0.18 | -0.69 | % |
| TOTALIZER - REF. FLOW RATE | | | | | 32.025 | LPS |
| TOTALIZER [MUT] | | | | | 3 | M3 |
| TEST TIME | | | | | 82.33 | SECONDS |
| CALC. TOTALIZER | | | | | 2.637 | M3 |
| ERROR | | | | | -1.41 | % |

COMMENTS

| QUALITY MANAGEMENT STANDARDS INFO. | | | RESULTS | | |
|------------------------------------|--------|------|-----------|------------|-----------|
| [QMS] INFORMATION | IDENT. | ID # | TEST | AVG % o.r. | PASS FAIL |
| [REFERENCE] FTS | KRO | 1 | DISPLAY | -0.64 | PASS |
| PROCESS METER | PM | AZ | mA OUTPUT | -0.23 | PASS |
| ANALOG METER | AM | N/A | TOTALIZER | -1.41 | PASS |
| STOP WATCH | SW | YES | | | |

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



[MUT] AS FOUND

FAIL
PASS

[MUT] AS LEFT

CUSTOMER OCWA – Kawartha Lakes Hub
 CONTACT Nick Leroux
 Senior Operations Manager
 123 East St S
 Bobcaygeon ON, K0M 1A0
 P: 705-623-7278
 E: nleroux@ocwa.com

[MUT] MANUFACTURER ABB
 MODEL AX460/600010/STD
 SERIAL NUMBER 3K22000652669
 CLIENT TAG n/a
 LOCATION Lagon City STP
 OTHER Final Effluent Flow
 GPS COORDINATES N 44°33.467 W 079°12.436

VER. BY Michael Jorrin

TOLERANCE [pH] 0.1

Quality Management Standards Information -
 Standards, reference equipment, and
 instrumentation used to conduct this test outlining
 the lot#, and expiry date is found in our current

VERIFICATION DATE June 08, 2021
 CAL. FREQUENCY Annual
 CAL. DUE DATE June-2022

pH VERIFICATION
NIST TRACEABLE (BUFFERS)

BEFORE CALIBRATION

| REFERENCE BUFFER | | | [MUT] READINGS | | | |
|------------------|-----------|--------------|----------------|-----------|------------------|-------------|
| pH BUFFER | TEMP. ° C | pH CORRECTED | pH | TEMP. ° C | pH - ERROR DIFF. | PASS FAIL |
| 4.01 | 25.0 | 4.01 | 5.01 | 25.0 | 1.00 | FAIL |
| 7.01 | 25.0 | 7.01 | 8.01 | 25.0 | 1.00 | FAIL |
| RESULT | | | | | | FAIL |

AFTER CALIBRATION

| REFERENCE BUFFER | | | [MUT] READINGS | | | |
|------------------|-----------|--------------|----------------|-----------|------------------|-------------|
| pH BUFFER | TEMP. ° C | pH CORRECTED | pH | TEMP. ° C | pH - ERROR DIFF. | PASS FAIL |
| 4.01 | 24.8 | 4.01 | 4.09 | 24.8 | 0.08 | PASS |
| 7.01 | 24.8 | 7.01 | 7.00 | 24.8 | -0.01 | PASS |
| RESULT | | | | | | PASS |

COMMENTS

Slope response extremely slow for Buffer 4.
 The electrode pair are becoming fatigued
 – probe replacement is recommended

| [QMS] INFORMATION | ITEM | ID # |
|-------------------|---------|------|
| [REFERENCE] | | |
| 4.01 BUFFER | pHBUFF4 | 1 |
| 7.01 BUFFER | pHBUFF7 | 1 |
| TEMPERATURE REF. | DDTEMP | 1 |

NIST Traceable Buffers were used to confirm the overall accuracy of this instrument. "AS FOUND" readings and "AS FOUND" readings are reported within this report. A temperature device was used to measure and record the buffer temperature to correct for pH values due to the effects related to buffer temperature.



VeriMaster - Flow Meter Verification Report

| Customer Information | | Meter Information | |
|-----------------------|-------------------|-----------------------|----------------|
| Customer | Lagoon city WWTP | Meter Owner | PS4 |
| Verification Download | Tue, Jun 08, 2021 | Meter Type | WaterMaster |
| | | Sensor Size | DN200 |
| | | Pipe Status | Fluid Present |
| | | Sensor Type | Fullbore |
| | | Sensor Serial No | 3K220000196136 |
| | | Transmitter Serial No | 3K220000382532 |
| | | Tag | FIT-SPS#4 |
| | | Location | ? |

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/-1% of its original factory calibration

| Summary of Results | | Verification History | |
|--------------------------------|--------------------------|-------------------------------|---------------------------|
| Coil Group | Passed | OIML Accuracy Alarms | 0 |
| Electrode Group | Passed | Totaliser Information | |
| Sensor Group | Passed | Forward | 1959962.98 m3 |
| Transmitter Signal | Passed | Reverse | 416.85 m3 |
| Transmitter Driver | Passed | Net | 2043207.46 m3 |
| Output Group | Passed | Sensor Data | |
| Configuration | Passed | Coil Current | 179.9 mA |
| | | Coil Inductance | 99.8 mH |
| | | Coil Inductance Shift | -0.3% |
| | | Coil / Loop Resistance | 32.3 ohm |
| Sensor Information | | Transmitter Data | |
| Q3 | 1000.00 m3/h | Tx Gain - Adjustment | 0.1% |
| Calibration Accuracy | OIML Class 2 | VeriMaster Information | |
| Sensor Calibration Factors | 113.8%; -0.55 mm/s; 11 | Version | 01.00.03 |
| Date of Manufacture | 2016 Oct 17 | Limit Version | 01.00.01 |
| Run Hours | 2070days 19hrs 30mins | Pulse Output | |
| Transmitter Information | | Output 1: 100.0Hz | Pass : 100.000 Hz ; 0.00% |
| Application Version | V01.06.00 03/03/15 | Output 1: 50.0Hz | Pass : 50.000 Hz ; 0.00% |
| MSP Version | 01.00.00 | Output 2: 100.0Hz | Pass : 100.000 Hz ; 0.00% |
| Date of Manufacture | 2016 Oct 17 | Output 2: 50.0Hz | Pass : 50.000 Hz ; 0.00% |
| Run Hours | 2360days 11hrs 48mins | | |
| Current Output | | | |
| 4mA Value | Pass : 4.000 mA ; 0.00% | | |
| 12mA Value | Pass : 12.000 mA ; 0.00% | | |
| 20mA Value | Pass : 20.000 mA ; 0.00% | | |

| Installation Comments / Equipment used: | Configuration Settings |
|---|-----------------------------|
| Verified with Verimaster | Mains Frequency |
| | 50 Hz |
| | Qmax |
| | 1000.00 m3/h |
| | Pulses/Unit |
| | 50.000000 |
| | Pulses Limit Frequency |
| | 100.0 Hz |
| | Sensor User Span/Zero |
| | -100.0%; 0.00 mm/s |
| | User Flow Cutoff/Hysteresis |
| | 0.00%; 20% |
| | Meter Mode |
| | Forward Flow |

Date Tue, Jun 08, 2021

Operator Signature

Print Name

ABB Instrumentation World Flow Technology

ABB Limited
Oldends Lane, Stonehouse
Gloucestershire, GL10 3TA UK
Tel: +44(0) 1453 826661
Fax: +44(0) 1453 821121
instrumentation@gb.abb.com

ABB Automation Inc.
125 East County Line Road
Warminster, PA 18974 USA
Tel: +1 215 674 6000
Fax: +1 215 674 6394
instrumentation@gb.abb.com

ABB Australia Pty Ltd.
Bapaune Rd
Moorebank, NSW 2170
Tel: +61-2-982 1-0111
Fax: +61-2-9821-0950

ABB Automation GmbH
Dransfelder Str.2
37079 Gottingen, GERMANY
Tel: +49 (0) 551 905212
Fax: +1 (215) 674 6394

Appendix III

Biosolids Data Summary

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digester Type: AEROBIC

Solids and Nutrients

Facility: LAGOON CITY WASTEWATER TREATMENT PLANT
 Period: 01/01/2021 to 12/01/2021
 Facility Name: LAGOON CITY WASTEWATER TREATMENT PLANT
 Facility Owner: Municipality: The Township of Ramara
 Facility Classification: Class 2 Wastewater Treatment

| Month | Total Sludge Hauled (m3) | Avg. Total Solids (mg/L) | Avg. Volatile Solids (mg/L) | Avg. Total Phosphorus (mg/L) | Ammonia (mg/L) | Nitrate (mg/L) | Nitrite (mg/L) | TKN (mg/L) | Ammonia + Nitrate (mg/L) | Potassium (mg/L) |
|--|--------------------------|--------------------------|-----------------------------|------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Site: LAGOON CITY WASTEWATER TREATMENT PLANT | | | | | | | | | | |
| Parameter Short Name | HauledVol | TS | VS | TP | NH3p_NH4p_N | NO3-N | NO2-N | TKN | calculation in report - | K |
| T/s | IH Month.Total | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | no T/S | Lab Published Month Mean |
| Jan | | 21,900.000 | 12,700.000 | 470.000 | 5.700 | 0.300 | 0.900 | 851.000 | 3.000 | 54.000 |
| Feb | | 25,800.000 | 13,800.000 | 570.000 | 3.700 | 2.600 | 0.200 | 452.000 | 3.150 | 45.000 |
| Mar | | 30,100.000 | 17,200.000 | 590.000 | 2.000 | 0.700 | 3.500 | 844.000 | 1.350 | 64.000 |
| Apr | 360.000 | 27,700.000 | 15,100.000 | 620.000 | 3.600 | 0.400 | 1.900 | 669.000 | 2.000 | 62.000 |
| May | | 23,500.000 | 13,000.000 | 550.000 | 1.000 | 0.300 | 0.400 | 476.000 | 0.650 | 51.000 |
| Jun | | 24,600.000 | 13,500.000 | 610.000 | 18.000 | 0.300 | 0.500 | 746.000 | 9.150 | 50.000 |
| Jul | | 21,600.000 | 12,200.000 | 420.000 | 9.500 | 0.300 | 0.400 | 604.000 | 4.900 | 38.000 |
| Aug | | 26,200.000 | 14,900.000 | 490.000 | 19.600 | 0.300 | 0.200 | 622.000 | 9.950 | 40.000 |
| Sep | 270.000 | 25,500.000 | 14,500.000 | 610.000 | 18.400 | 0.300 | 0.300 | 889.000 | 9.350 | 52.000 |
| Oct | 360.000 | 25,100.000 | 14,300.000 | 530.000 | 14.000 | 0.300 | 0.200 | 818.000 | 7.150 | 40.000 |
| Nov | | 29,800.000 | 15,400.000 | 710.000 | 4.800 | 1.500 | 2.400 | 732.000 | 3.150 | 47.000 |
| Dec | | 18,700.000 | 10,200.000 | 430.000 | 1.400 | 0.300 | 0.300 | 526.000 | 0.850 | 45.000 |

| | | | | | | | | | | |
|----------------|---------|-------------|-------------|-----------|---------|-------|--------|-----------|--------|---------|
| Average | 330.000 | 25,041.667 | 13,900.000 | 550.000 | 8.475 | 0.633 | 0.933 | 685.750 | 4.554 | 49.000 |
| Total | 990.000 | 300,500.000 | 166,800.000 | 6,600.000 | 101.700 | 7.600 | 11.200 | 8,229.000 | 54.650 | 588.000 |

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digester Type: AEROBIC

Metals and Criteria

Facility: LAGOON CITY WASTEWATER TREATMENT PLANT
Period: 01/01/2021 to 12/01/2021

| Month | Arsenic (mg/L) | Cadmium (mg/L) | Cobalt (mg/L) | Chromium (mg/L) | Copper (mg/L) | Mercury (mg/L) | Molybdenum (mg/L) | Nickel (mg/L) | Lead (mg/L) | Selenium (mg/L) | Zinc (mg/L) |
|----------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Site | LAGOON CITY WASTEWATER TREATMENT PLANT | | | | | | | | | | |
| Parameter Short Name | As | Cd | Co | Cr | Cu | Hg | Mo | Ni | Pb | Se | Zn |
| T/s | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean | Lab Published Month Mean |
| Jan | 0.100 | 0.013 | 0.020 | 0.370 | 3.400 | 0.004 | 0.050 | 0.220 | 0.200 | 0.100 | 9.000 |
| Feb | 0.100 | 0.015 | 0.030 | 0.460 | 4.100 | 0.004 | 0.050 | 0.270 | 0.200 | 0.100 | 12.000 |
| Mar | 0.200 | 0.020 | 0.030 | 0.460 | 4.600 | 0.005 | 0.900 | 0.270 | 0.200 | 0.100 | 13.000 |
| Apr | 0.100 | 0.016 | 0.030 | 0.430 | 4.100 | 0.005 | 0.050 | 0.270 | 0.200 | 0.100 | 12.000 |
| May | 0.100 | 0.015 | 0.030 | 0.410 | 3.900 | 0.004 | 0.050 | 0.260 | 0.200 | 0.100 | 11.000 |
| Jun | 0.100 | 0.015 | 0.030 | 0.370 | 4.100 | 0.006 | 0.050 | 0.240 | 0.200 | 0.100 | 12.000 |
| Jul | 0.100 | 0.012 | 0.020 | 0.260 | 3.200 | 0.006 | 0.050 | 0.200 | 0.100 | 0.100 | 9.000 |
| Aug | 0.100 | 0.014 | 0.030 | 0.320 | 3.700 | 0.006 | 0.050 | 0.250 | 0.200 | 0.100 | 11.000 |
| Sep | 0.100 | 0.017 | 0.030 | 0.350 | 4.000 | 0.008 | 0.060 | 0.270 | 0.200 | 0.100 | 13.000 |
| Oct | 0.100 | 0.015 | 0.030 | 0.310 | 3.800 | 0.015 | 0.050 | 0.240 | 0.200 | 0.100 | 11.000 |
| Nov | 0.200 | 0.026 | 0.050 | 0.570 | 6.600 | 0.011 | 0.070 | 0.440 | 0.300 | 0.100 | 19.000 |
| Dec | 0.100 | 0.013 | 0.020 | 0.300 | 3.400 | 0.008 | 0.050 | 0.220 | 0.100 | 0.100 | 10.000 |

| | | | | | | | | | | | |
|---|---------|--------|---------|-----------|-----------|--------|--------|---------|-----------|--------|-----------|
| Average | 0.117 | 0.016 | 0.029 | 0.384 | 4.075 | 0.007 | 0.123 | 0.263 | 0.192 | 0.100 | 11.833 |
| Max. Permissible Metal Concentrations (mg/kg of | 170.000 | 34.000 | 340.000 | 2,800.000 | 1,700.000 | 11.000 | 94.000 | 420.000 | 1,100.000 | 34.000 | 4,200.000 |
| Metal Concentrations in Sludge (mg/kg) | 4.659 | 0.636 | 1.165 | 15.341 | 162.729 | 0.273 | 4.925 | 10.483 | 7.654 | 3.993 | 472.546 |