Bobcaygeon Wastewater Treatment Plant

Works # 110002498

Annual Wastewater Performance Report

Prepared For: The City of Kawartha Lakes

Reporting Period of January 1st – December 31st, 2023

Issued: March 28, 2024

Revision: 0

Operating Authorities:

Kawartha Lakes

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

2023 Performance Report for Bobcaygeon Wastewater Treatment Facility

The Bobcaygeon Sewage Works, unless noted within this report, complies with all requirements of the regulating authorities and operates under:

- Environmental Compliance Approval (ECA) No. 3028-AEUKDQ issued April 10, 2017
- Environmental Compliance Approval (ECA) No. 141-W601 issued June 20, 2023

Amended Environmental Certificate of Approval (ECA) #3028-AEUKDQ Section 11(4) requires the Performance Report to contain the following:

a) a summary and interpretation of all monitoring data and a comparison to the Final Effluent limits outlined in Compliance Limits condition, including an overview of the success and adequacy of the 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 6;

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) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification;

k) a report summarizing all modifications completed as a result of Schedule B, Section 3; and

l) any other information the Water Supervisor requires from time to time; and

ECA #3028-AEUKDQ Section 6(3) states “The Owner shall make an assessment of the issues and recommendation of pro-active actions if any is required under the following situations and include in the annual report to the Water Supervisor:

a. when any of the design objectives is not achieved consistently; ·
b. when the Annual Average Daily Flow reaches 80% of the Rated Capacity.”

The Environmental Compliance Approval Number 141-W601 for the City of Kawartha Lakes Wastewater Collection System, including the Bobcaygeon Sewage Collection System, stipulates that the Owner shall prepare an annual performance report for the Authorized System and includes:

Schedule E – Reporting (4.6)

a) a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.

b) a summary of any operating problems encountered and corrective actions taken.

c) a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.

d) a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.

e) a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.

f) a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:

   i. Dates;

   ii. Volumes and durations;

   iii. If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli;

   iv. Disinfection, if any; and

   v. Any adverse impact(s) and any corrective actions, if applicable.

g) a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable:

   i. A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted.

ii. Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines.

iii. An assessment of the effectiveness of each action taken.

iv. An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.

v. Public reporting approach including proactive efforts.

Environmental Compliance Approval (ECA) No. 3028-AEUKDQ

The following is a report from the records maintained by the Ontario Clean Water Agency for the Bobcaygeon WWTP for the calendar year 2023:

(a,f) Overall, the plant process ran well in 2023. The following tables summarize the monthly effluent quality results in comparison to the effluent limits, Condition 7 of Certificate of Approval #3028-AEUKDQ (issued April 10, 2017).

Attached as **Appendix I** is a copy of the 2023 Performance Assessment Report (PAR) and loading calculations for the Bobcaygeon WWTP, for the facility's combined final effluent. The PAR contains: a tabulation of all monthly average raw sewage and final effluent sample results obtained during the reporting period, a tabulation of average daily flows, and monthly volumes for the reporting period, and a tabulation of calculated total loading of BOD/CBOD^5, suspended solids, total phosphorus, and ammonia + ammonium as N concentrations in the final effluent.

The Bobcaygeon WWTP has a Rated Capacity of 3,055 m^3/day and a Peak Capacity of 10, 440 m^3/day. The total final effluent flow was 942,826.10 m^3 and the average daily flow was 2,583.09 m^3/day which is 84.6% of the rated capacity.

In 2022, CCTV inspections were completed along with the sanitary sewer flushing of the entire collection system. The findings of the CCTV inspections were reviewed by an engineering consultant who assigned a priority ranking based on low, medium or high for each deficiency identified. A contract was awarded in 2023, to make the necessary repairs to the deficiencies identified. Various repair methods were utilized including, heaving cleaning, specialty cleaning such as hydraulic reaming and robotic cutting, injection grouting, cured in place piping liners and mechanical spot repairs. Construction was ongoing into 2024.

OCWA initiated a Facility Optimization Program (FOP) in 2017 for the Bobcaygeon WWTP. Through the FOP, a comprehensive review of plant performance was conducted. This report provides details of the program and key findings through review of background information, plant treatment performance and capacity evaluation to establish opportunities for improved plant operations. To evaluate the impact of inflow and infiltration (I&I) on the influent flows to the plant, the historical flow data was analyzed**.** Over a 36-month period, the average influent flow to the facility increased by 50% and the average flow exceeded the rated design

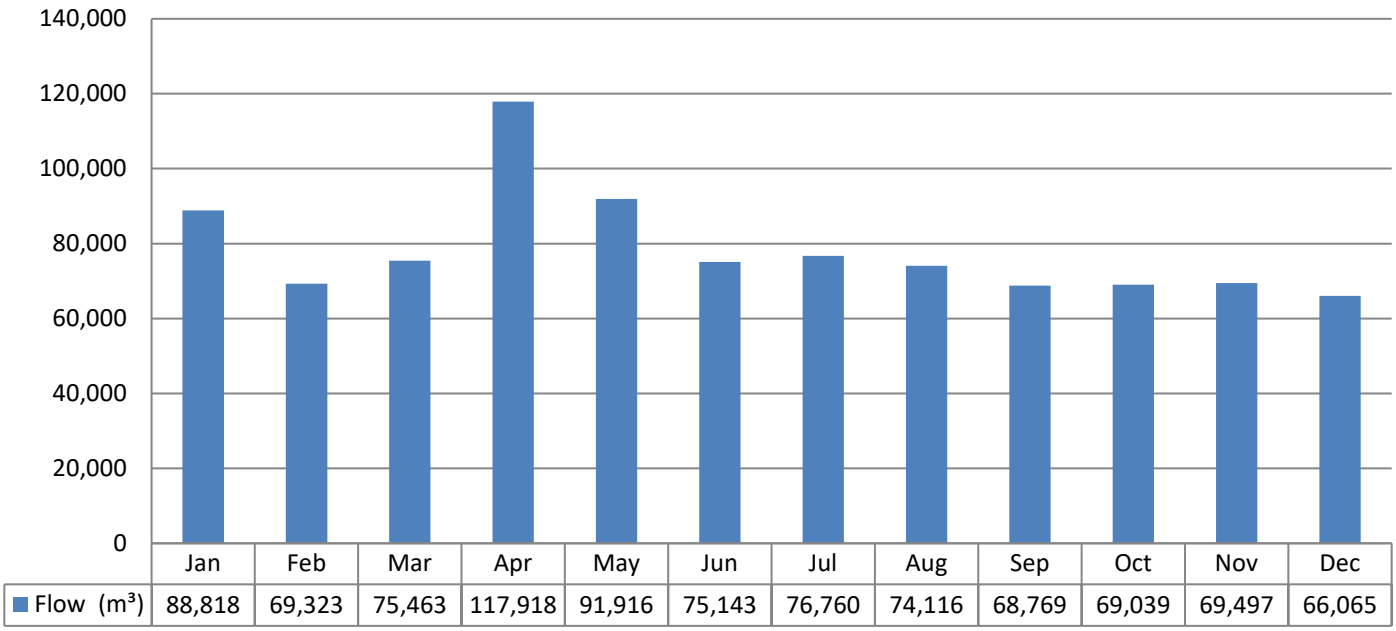
capacity of 3,055 m^3/d in 2017 by 5%. The influent concentrations became more dilute on average over the 36-month period. The increased flows and decreased organic loading is an indicator of significant I&I into the collection system.

Precipitation data from 2017 from the Environment Canada website for the weather station nearest to Bobcaygeon (Peterborough, ON) was analyzed to determine if there was a correlation between higher precipitation and higher flows to the plant.

The correlation between the periods of high influent flow and high precipitation amounts is strong, particularly in the spring season. A peak in the precipitation trend is immediately followed by a peak in the influent flow to the plant.

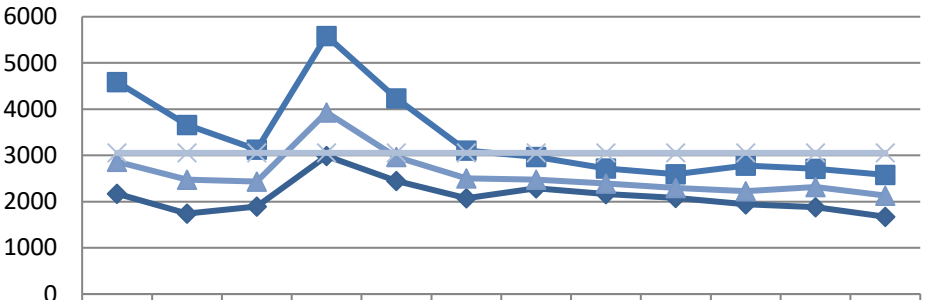
OCWA will continue ongoing efforts to work in partnership with the City of Kawartha Lakes to reduce I&I to reduce the flows to the wastewater treatment plant. A further review of influent flows will be analyzed into 2024, following the completion of the extensive rehabilitation program.

Graph 1: 2023 Final Effluent Flow Monthly Totals



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow (m^3)	88,818	69,323	75,463	117,918	91,916	75,143	76,760	74,116	68,769	69,039	69,497	66,065

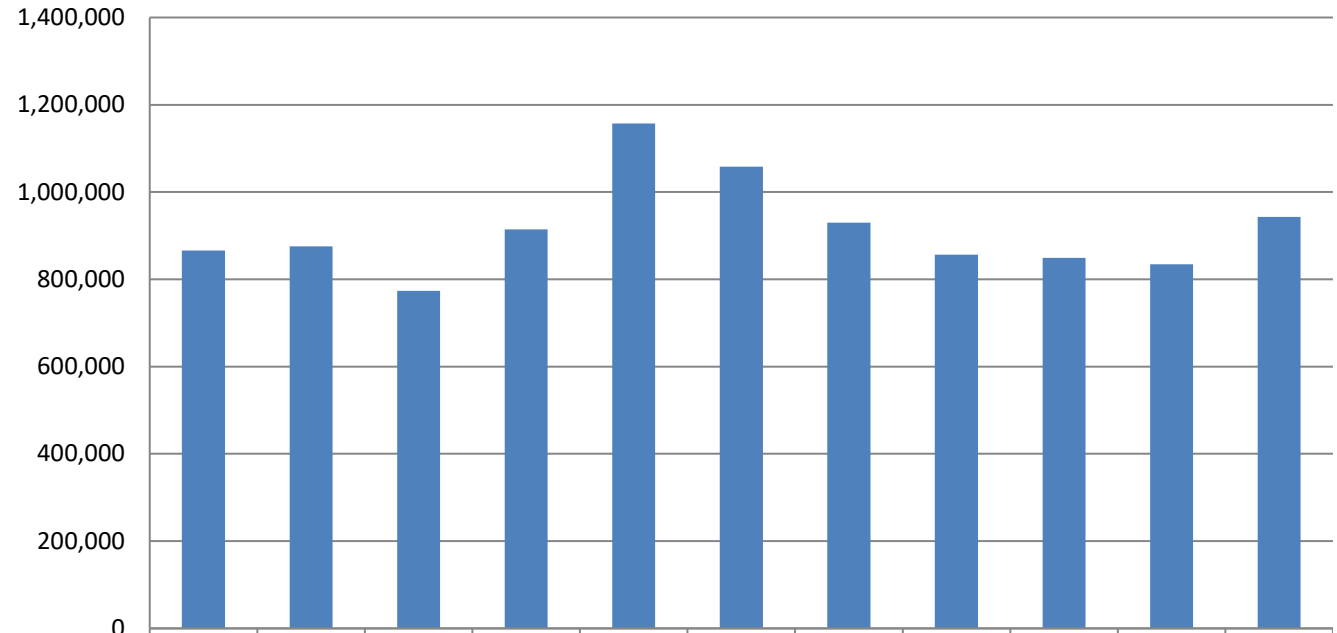
Graph 2: 2023 Final Effluent Daily Minimum, Maximum and Average Flows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (m^3/day)	2169	1744	1892	2986	2446	2076	2291	2161	2083	1945	1879	1673
Max (m^3/day)	4590	3659	3125	5586	4232	3102	2965	2716	2592	2783	2714	2578
Avg(m^3/day)	2865	2476	2434	3931	2965	2505	2476	2391	2292	2227	2317	2131
Rated Capacity (m^3/day)	3055	3055	3055	3055	3055	3055	3055	3055	3055	3055	3055	3055

There may be instances where effluent flow exceeded the Rated Capacity on a monthly basis. However, Rated Capacity is calculated as an annual average daily flow rate, which was met in 2023.

Graph 3: Historical Effluent Flows from 2013 to 2023



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Eff Flow(m^3)	866,286	875,892	773,874	914,619	1,156,976	1,058,505	930,085	856,220	849,282	834,579	942,826

ECA #3028-AEUKDQ (issued April 10, 2017) Condition 9(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 1: Minimum Sampling Requirements

Influent Sampling Point

Parameters	Sample Type	Frequency
BOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly

Final Effluent Sampling Point

Parameters	Sample Type	Frequency
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
Total Ammonia Nitrogen	Composite	Weekly
E. coli	Grab	Weekly
pH	Grab	Weekly
Temperature	Grab	Weekly
Acute Lethality to Rainbow Trout and Daphnia magna	Grab	Quarterly

Effluent Parameter Summary

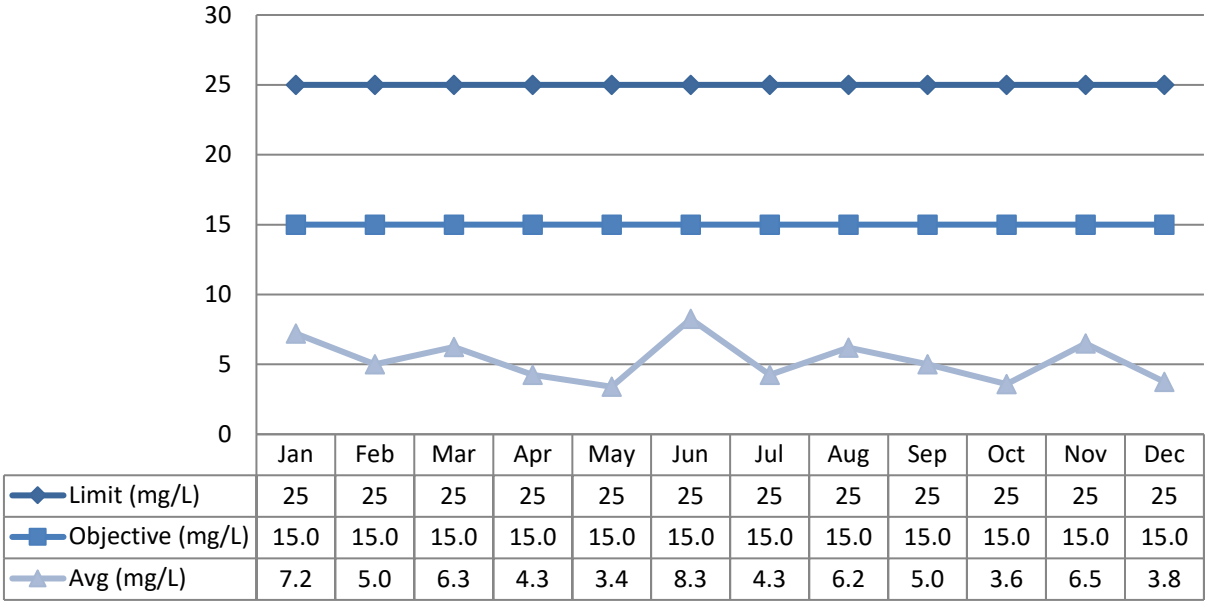
<u>Carbonaceous Biochemical Oxygen Demand (CBOD5)</u>

ECA #3028-AEUKDQ sets the CBOD5 monthly average concentration limit at 25.0 mg/L and the monthly average waste loading at 76.4 kg/day. The monthly CBOD5 average concentration results and monthly average waste loading results were in compliance with the limits and objectives outlined in ECA 3028-AEUKDQ in every month in 2023.

CBOD5 Monthly Average Concentration

The CBOD5 monthly average concentration limit and monthly concentration objective were met each month in 2023

Graph 4: 2023 Monthly CBOD5 Final Effluent Concentration Comparisons



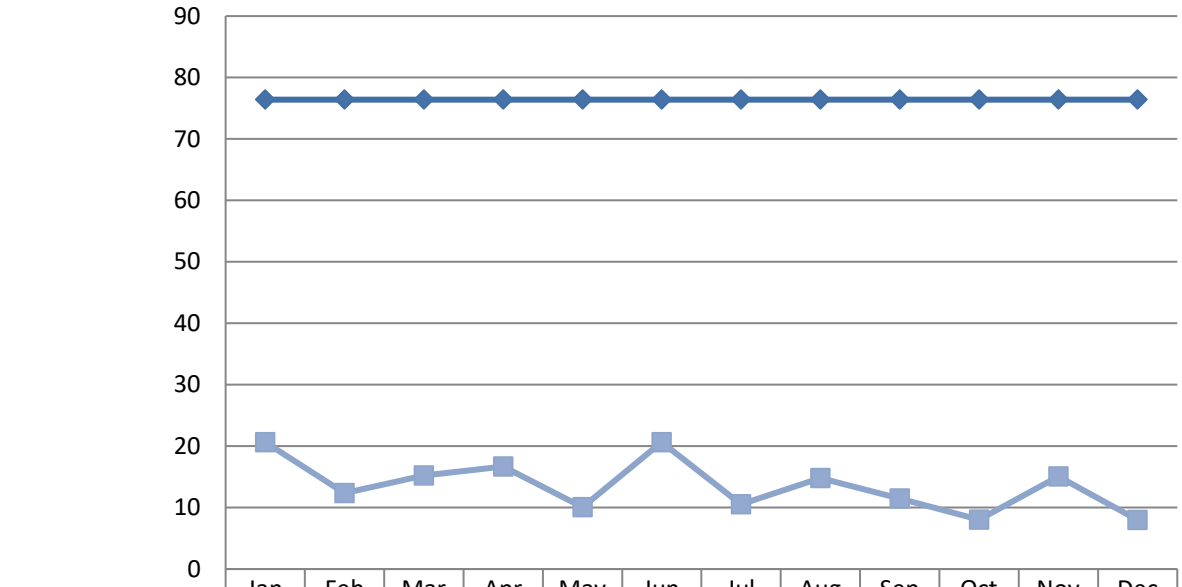
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	25	25	25	25	25	25	25	25	25	25	25	25
Objective (mg/L)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Avg (mg/L)	7.2	5.0	6.3	4.3	3.4	8.3	4.3	6.2	5.0	3.6	6.5	3.8

The Bobcaygeon WWTP was able to consistently meet the Effluent Objectives and Limits for CBOD throughout 2023.

CBOD5 Monthly Average Waste Loading

The monthly CBOD5 monthly average waste loading limit was met each month in 2023.

Graph 5: 2023 Monthly Final Effluent CBOD5 Average Waste Loading Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4
Avg (kg/day)	20.6	12.4	15.2	16.7	10.1	20.7	10.5	14.8	11.5	8.0	15.1	8.0

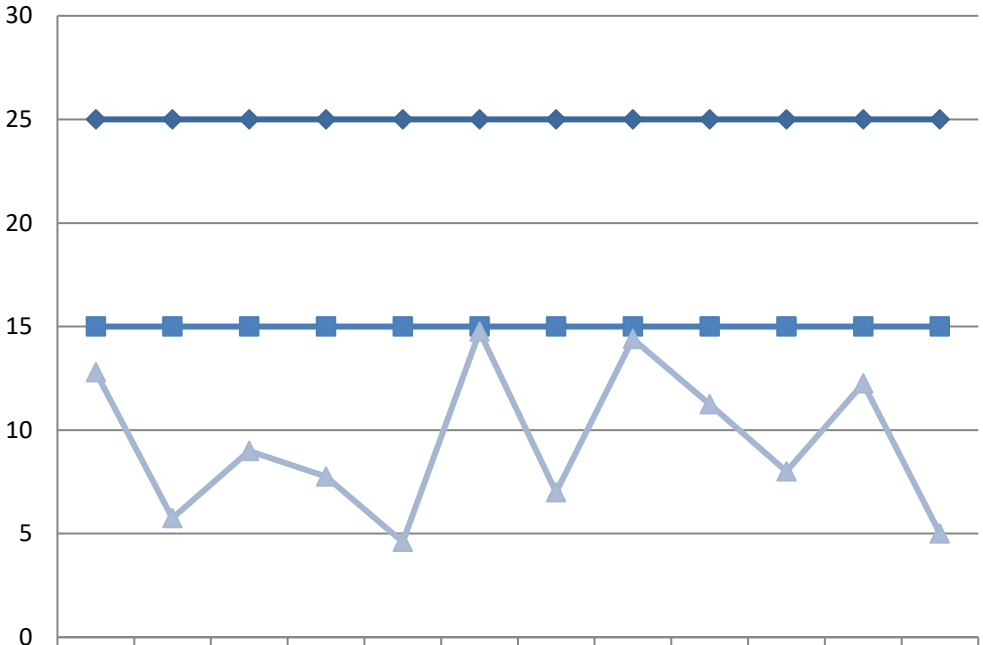
Total Suspended Solids (TSS)

ECA #3028-AEUKDQ sets the TSS monthly average concentration limit at 25.0 mg/L and the monthly average waste loading at 76.4 kg/day. The monthly TSS average concentration results and monthly average waste loading results throughout 2023 were in compliance with the limits and objectives outlined in ECA 3028-AEUKDQ.

Total Suspended Solids Monthly Average Concentration

The Total Suspended Solids monthly average concentration limit was met each month in 2023.

Graph 6: 2023 Monthly TSS Final Effluent Concentration Comparisons

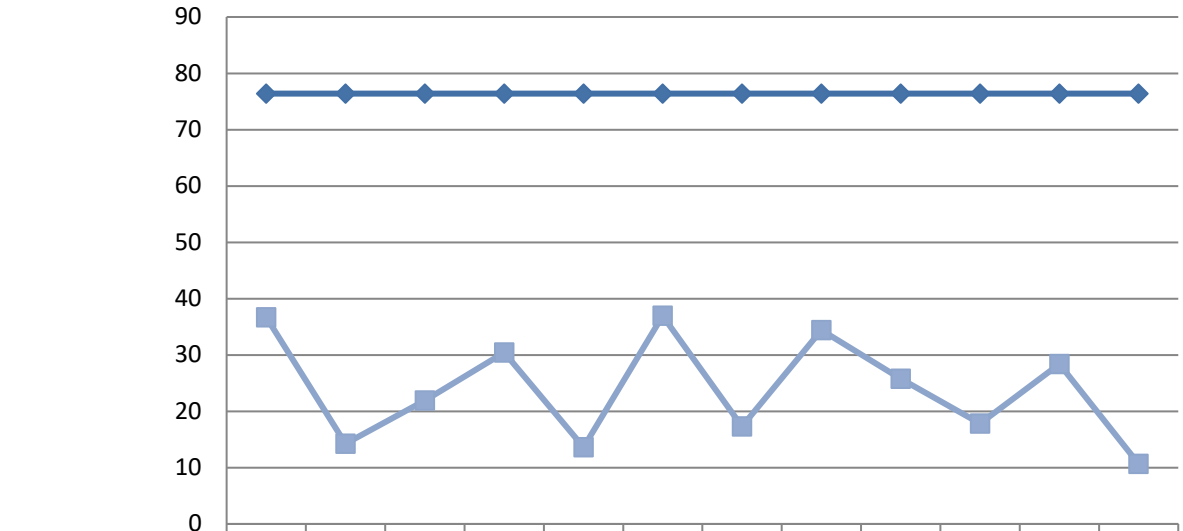


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	25	25	25	25	25	25	25	25	25	25	25	25
Objective (mg/L)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Avg (mg/L)	12.8	5.8	9.0	7.8	4.6	14.8	7.0	14.4	11.3	8.0	12.3	5.0

Total Suspended Solids Monthly Average Waste Loading Limits

The monthly Total Suspended Solids monthly average waste loading limit was met each month in 2023.

Graph 7: 2023 Monthly Final Effluent TSS Average Waste Loading Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4
Avg (kg/day)	36.7	14.2	21.9	30.5	13.6	36.9	17.3	34.4	25.8	17.8	28.4	10.7

Total Phosphorus (TP)

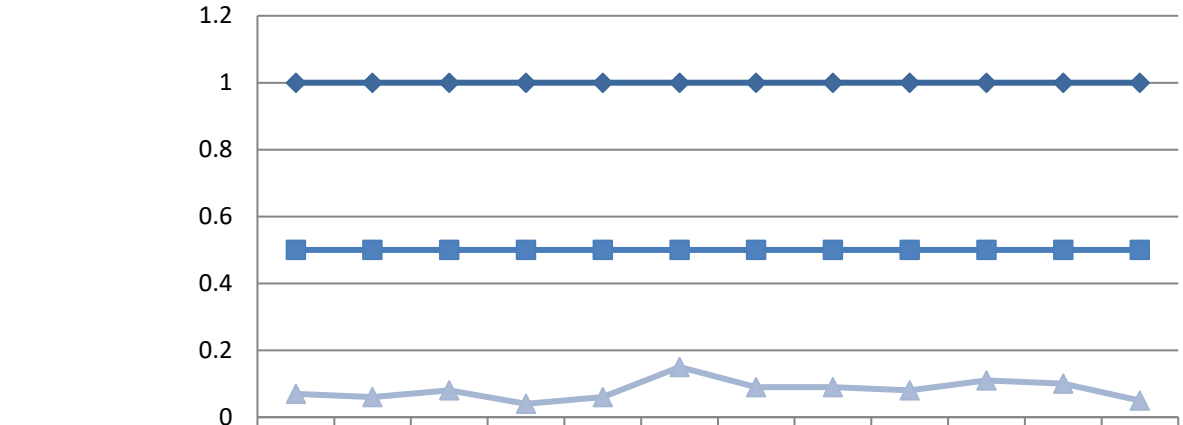
ECA #3028-AEUKDQ sets the TP annual monthly concentration limit at 1.0 mg/L and the monthly average waste loading at 1.3 kg/day. The monthly Total Phosphorus average concentration results and monthly average waste loading results throughout 2023 were in compliance with the limits and objectives.

Total Phosphorus (TP)

Total Phosphorus Monthly Average Concentration

The monthly Total Phosphorus monthly average concentration limit and monthly concentration objective were met each month in 2023.

Graph 8: 2023 Monthly Total Phosphorus Final Effluent Concentration Limit Comparisons

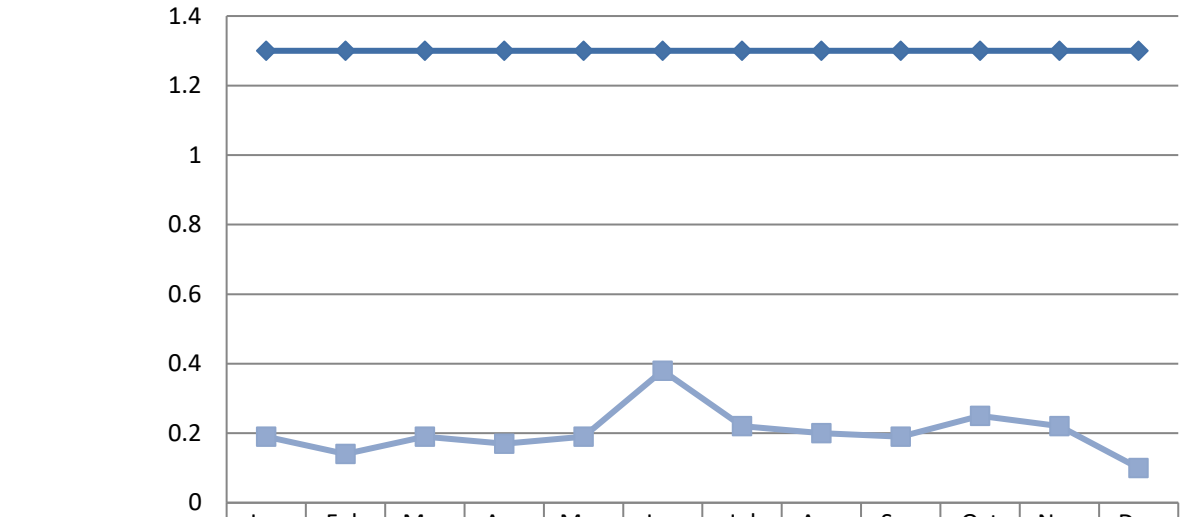


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Objective (mg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Avg (mg/L)	0.07	0.06	0.08	0.04	0.06	0.15	0.09	0.09	0.08	0.11	0.10	0.05

Total Phosphorus Monthly Average Waste Loading Limits

The monthly Total Phosphorus monthly average waste loading limit was met each month in 2023.

Graph 9: 2023 Monthly Final Effluent Total Phosphorus Average Waste Loading Comparisons

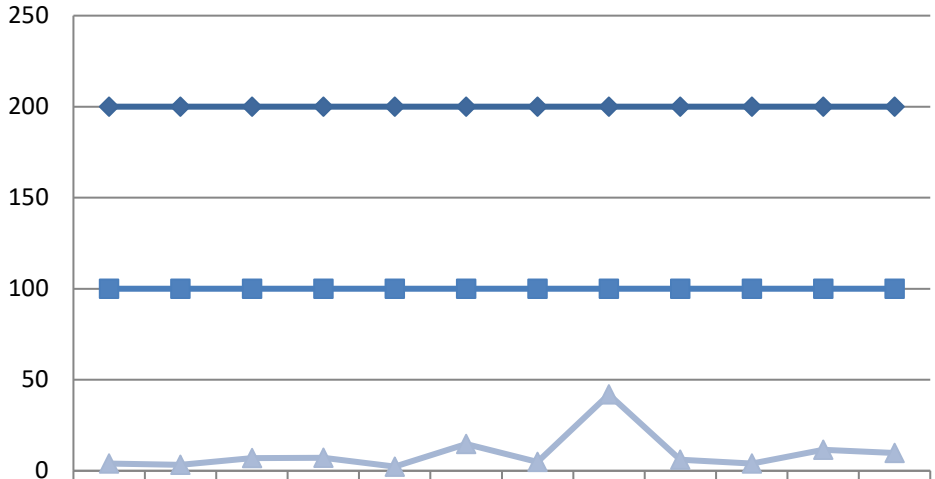


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (kg/day)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Avg (kg/day)	0.19	0.14	0.19	0.17	0.19	0.38	0.22	0.20	0.19	0.25	0.22	0.10

E. coli

ECA #3028-AEUKDQ sets the monthly geometric mean density of E. coli at 200 cfu/100mL and the monthly geomean limit was met each month in 2023. There was one instance of an individual E.coli sample returning with a result of No Data: Overgrown with E.coli (NDOGEC) on April 25, 2023.

Graph 10: 2023 Monthly E. Coli Final Effluent Geometric Mean Comparisons

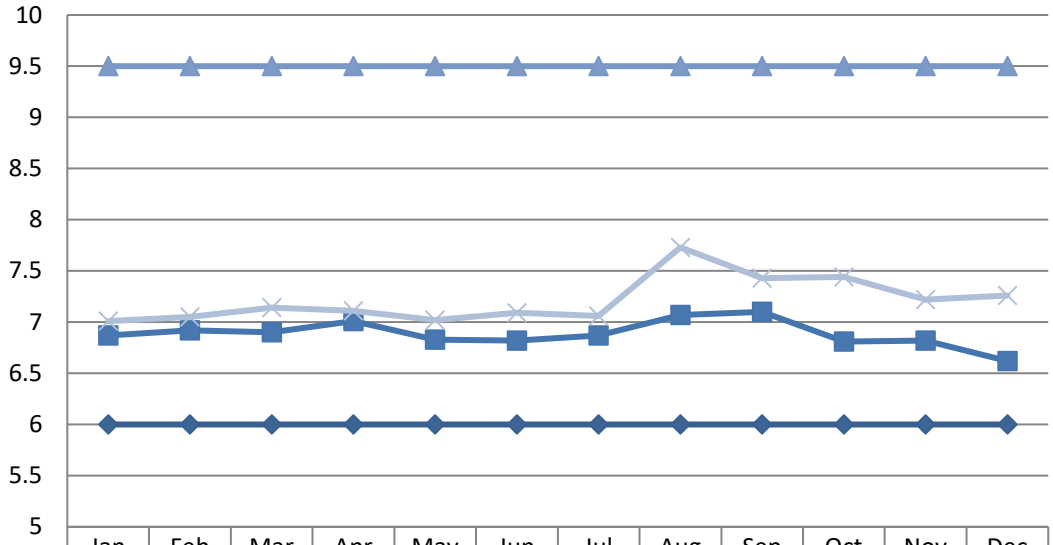


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit (mg/L)	200	200	200	200	200	200	200	200	200	200	200	200
Objective (mg/L)	100	100	100	100	100	100	100	100	100	100	100	100
Geomean (cfu/100mL)	3.95	3.31	6.88	7.14	2.30	14.73	4.90	41.91	6.05	3.92	11.46	9.86

pH

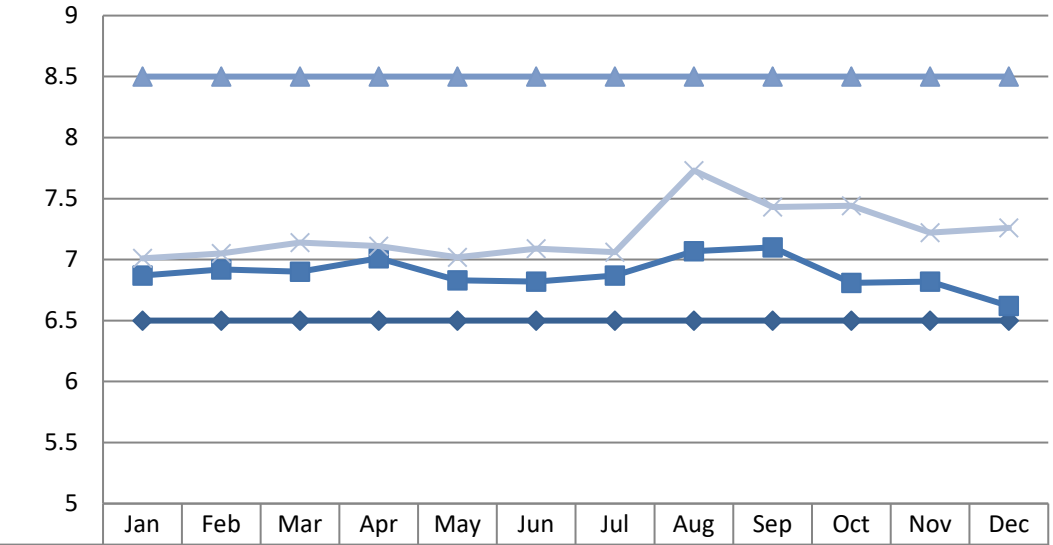
ECA #3028-AEUKDQ has a pH compliance limit within the range of 6.0 to 9.5, inclusive, at all times. The pH of the final effluent ranged from 6.62 – 7.73 throughout 2023 which is within the ECA compliance limit at all times.

Graph 11: 2023 Monthly pH Final Effluent Concentration Limit Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min Limit	6	6	6	6	6	6	6	6	6	6	6	6
Min Result	6.87	6.92	6.90	7.01	6.83	6.82	6.87	7.07	7.10	6.81	6.82	6.62
Max Limit	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Max Result	7.01	7.05	7.14	7.11	7.02	7.09	7.06	7.73	7.43	7.44	7.22	7.26

Graph 12: 2023 Monthly pH Final Effluent Concentration Objectives Comparisons



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min Objective	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Min Result	6.87	6.92	6.90	7.01	6.83	6.82	6.87	7.07	7.10	6.81	6.82	6.62
Max Objective	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Max Result	7.01	7.05	7.14	7.11	7.02	7.09	7.06	7.73	7.43	7.44	7.22	7.26

Acute Lethality to Rainbow Trout and Daphnia Magna

Quarterly effluent samples are collected for analysis for acute lethality to rainbow trout and Daphnia magna and a summary of the results are provided in **Appendix II: Acute Lethality Summary**. Samples were collected on January 24, April 27, September 12 and November 11, 2023. All of the 2023 samples resulted in a 0% mortality rate for both Rainbow Trout and Daphnia magna.

(b) The 2011 Ministry of the Environment, Conservation and Parks Compliance Inspection Report identified odour issues as a concern with the Bobcaygeon WWTP. A requirement of the Inspection Report was to develop an action plan implementing odour control options as detailed by Cambium Environmental in their report "Mitigation of Odours Bobcaygeon Water Pollution Control Plant" dated October 18, 2010. The action plan included the preferred option and a timeline for installing the odour mitigation equipment. A pilot study using photoionization was implemented at the Bobcaygeon WWTP in 2013 and the results indicated that this method was not able to sufficiently achieve the desired results.

Operational measures currently in place to reduce odour complaints from nearby residents are:

- Operational staff continue to monitor wind direction
- Potential odour producing maintenance activities continue to be minimized during unfavourable wind direction (if at all possible)
- Potential odour causing activities are scheduled to reduce the impact on local residents as much as possible.
- Purchased and installed odour control units on digester decant wet well and for use when filling sludge trucks.

Table 2: Bobcaygeon WWTP Operational Challenges

Month	Challenges	Corrective Actions
January	UV Faults	Assess UV intensity, waste solids, clean UV sensors.
	High flow	High flows due to weather.
February	UV Faults	Determined 7.5 HP Return Activated Sludge (RAS) pump currently installed is providing too high of a minimum flow causing UV Faults. Replace 7.5HP pump with 5 HP pump to reduce minimum RAS flow.
March	High flows	Seasonal high flows due to weather.
	Train 2 Composite Sampler Unable to Pull Sample	Investigate suction end, replace suction tubing and test sampler pump, adjust tubing suction length. Collect manual composite sample while composite sampler down.

Month	Challenges	Corrective Actions
	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clean UV sensors
April	High Flows	Seasonal high flows due to high rains.
	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	Train 2 Composite Sampler Freezing Samples	Contractor replaced temperature switch assembly. Collect manual composite sample while composite sampler down.
	Digester Valve Broke	Valve repaired with replacement parts
May	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	High Flows	High flows due to high rains
June	High Flows	High flows due to high rains
	Waste Activated Sludge (WAS) Valve Failing to Move	Valve unable to open and close automatically, opened and closed manually until replacement automatic valve actuator installed.
	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
July	Raw Composite Sampler	New sampler installed
	High Flows	High flows due to summer season, increased usage and weather
	Bar Screens Clogging Over Weekend	Due to higher flows, bar screens clogging and causing alarms over weekends. Conduct manual bar screen cleaning on weekends.
	Scum Box Piping Clogging	Replace scum box piping on both trains by contractor
	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
August	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	Train 2 Alum Dosing Line Issues	Run temporary dosing line until contractor available to replace entire line, replace heat trace.
	SPS 5 Pump 1 Failure	Pull failed pump and install temporary pump until permanent replacement installed.
	Bar Screens Clogging Over Weekend	Due to higher flows, bar screens clogging and causing alarms over weekends. Conduct manual bar screen cleaning on weekends.

Month	Challenges	Corrective Actions
September	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	High Flows	High flows due to high rains
	Bar Screens Clogging Over Weekend	Due to higher flows, bar screens clogging and causing alarms over weekends. Conduct manual bar screen cleaning on weekends.
October	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	High Flows	High flows due to high rains
November	UV Faults	Multiple UV faults as a result of high flows. Assess UV intensity, waste solids, clear opposite bar screen, clean UV sensors
	High Flows	High flows due to high rains

(c) OCWA uses a Work Maintenance System (WMS) 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: Maintenance Summary** for details of equipment upgrades, repairs and service performed in 2023.

(d) 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.

Continuous phosphorus removal is achieved with the dosing of aluminum sulfate.

Table 3: 2023 Summary of Aluminum Sulfate Usage and Dosage

Month	Total Aluminum Sulfate Used (kg)	Aluminum Sulfate Average Dosage (mg/L)
January	3662.68	41.24
February	2792.13	40.22
March	3052.81	40.37
April	4849.94	41.11
May	3714.04	40.38
June	2645.43	35.24
July	2969.58	38.74
August	2891.06	39.01
September	2657.41	38.62
October	2651.63	38.44
November	2599.69	37.46
December	2449.52	37.23

(e) Calibrations on effluent monitoring equipment were performed by Franklin Empire on August 24, 2023 for equipment located at the Bobcaygeon Wastewater Treatment Plant. Please see **Appendix IV: Calibration Report.**

Records of maintenance carried out on effluent monitoring equipment can be found in **Appendix III: Maintenance Summary.**

(f) 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, pH, 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.

Continuous efforts were made to meet the Effluent Objectives in 2023 including:

- Sampling effluent as per the ECA.
- Visual Inspection of the effluent while performing rounds.

- Influent monitoring.
- Ensuring that chemicals are being dosed.
- Calibration of lab equipment.
- Annual calibration of the flow meters.
- Performing preventative maintenance activities in accordance with work order schedules.
- Performing in-house lab tests on days that data is collected.
- Monitoring treatment processes by performing regular laboratory analysis and review of lab results.
- Sludge monitoring of primary clarifiers & adjustments to pumping volume based on tank levels to reduce solids carryover to the secondary clarifiers.
- Visual review of microbiological activity of activated sludge to ensure appropriate F/M ratio.

Carbonaceous Biochemical Oxygen Demand (CBOD5)

ECA #3028-AEUKDQ sets the CBOD5 monthly average concentration objective at 15.0 mg/L.

Table 4: 2023 Monthly CBOD5 Final Effluent Concentration Objective Comparisons

Monthly Average	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	7.20	15.0	Yes
February	5.00	15.0	Yes
March	6.25	15.0	Yes
April	4.25	15.0	Yes
May	3.40	15.0	Yes
June	8.25	15.0	Yes
July	4.25	15.0	Yes
August	6.20	15.0	Yes
September	5.00	15.0	Yes
October	3.60	15.0	Yes
November	6.50	15.0	Yes
December	3.75	15.0	Yes

Total Suspended Solids (TSS)

ECA #3028-AEUKDQ sets the TSS monthly average concentration objective at 15.0 mg/L.

Table 5: 2023 Monthly TSS Final Effluent Concentration Objective Comparisons

Month	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	12.80	15.0	Yes
February	5.75	15.0	Yes
March	9.00	15.0	Yes
April	7.75	15.0	Yes
May	4.60	15.0	Yes
June	14.75	15.0	Yes
July	7.00	15.0	Yes
August	14.40	15.0	Yes
September	11.25	15.0	Yes
October	8.00	15.0	Yes
November	12.25	15.0	Yes
December	5.00	15.0	Yes

Total Phosphorus (TP)

ECA #3028-AEUKDQ sets the TP monthly average concentration objective at 0.5 mg/L.

Table 6: 2023 Monthly TP Final Effluent Concentration Objective Comparisons

Month	Average Concentration (mg/L)	Concentration Objective Target (mg/L)	Objective Achieved
January	0.07	0.5	Yes
February	0.06	0.5	Yes
March	0.08	0.5	Yes
April	0.04	0.5	Yes
May	0.06	0.5	Yes
June	0.15	0.5	Yes
July	0.09	0.5	Yes
August	0.09	0.5	Yes
September	0.08	0.5	Yes
October	0.11	0.5	Yes
November	0.10	0.5	Yes
December	0.05	0.5	Yes

E.coli
ECA #3028-AEUKDQ sets the monthly E. coli geometric mean objective at 100 cfu/100mL.

Table 7: 2023 Monthly E. Coli Final Effluent Concentration Objective Comparisons

Month	Geometric Mean (cfu/100mL)	Concentration Objective Target (cfu/100mL)	Objective Achieved
January	3.95	100	Yes
February	3.31	100	Yes
March	6.88	100	Yes
April	7.14	100	Yes
May	2.30	100	Yes
June	14.73	100	Yes
July	4.90	100	Yes
August	41.91	100	Yes
September	6.05	100	Yes
October	3.92	100	Yes
November	11.46	100	Yes
December	9.86	100	Yes

pH
The pH of the effluent was within the ECA design objectives of 6.50 to 8.50, inclusive, at all times. The pH of the effluent ranged from 6.62 – 7.73 throughout 2023.

Table 8: 2023 Monthly pH Final Effluent Concentration Objective Comparisons

Month	Minimum	Maximum	Objective Achieved
January	6.87	7.01	Yes
February	6.92	7.05	Yes
March	6.90	7.14	Yes
April	7.01	7.11	Yes
May	6.83	7.02	Yes
June	6.82	7.09	Yes
July	6.87	7.06	Yes
August	7.07	7.73	Yes
September	7.10	7.43	Yes
October	6.81	7.44	Yes
November	6.82	7.22	Yes
December	6.62	7.26	Yes

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 9: 2023 Monthly Unionized Ammonia Final Effluent Concentration Objective Comparisons

Month	Average Concentration (ug/L)	Concentration Objective Target (ug/L)	Objective Achieved
January	1.62	100	Yes
February	6.26	100	Yes
March	7.02	100	Yes
April	9.35	100	Yes
May	24.4	100	Yes
June	51.4	100	Yes
July	24.7	100	Yes
August	41.6	100	Yes
September	51.2	100	Yes
October	35.1	100	Yes
November	21.1	100	Yes
December	11.2	100	Yes

Temperature

The final effluent temperature ranged from 7.7ºC to 23.3ºC.

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.

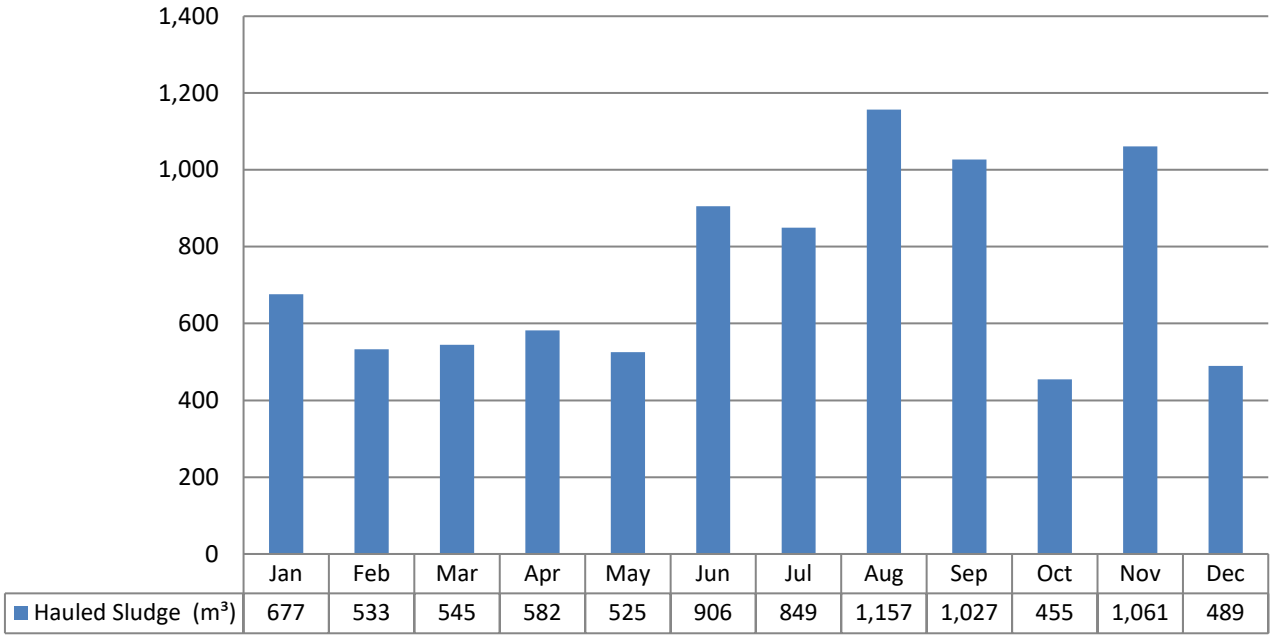
Table 10: 2023 Monthly Influent Sample Result Concentration Averages

Month	Carbonaceous Biochemical Oxygen Demand - CBOD5 (mg/L)	Biochemical Oxygen Demand - BOD5 (mg/L)	Total Suspended Solids – TSS (mg/L)	Total Kjeldahl Nitrogen – TKN (mg/L)	Total Phosphorus – TP (mg/L)
January	318.40	395.60	242.40	20.14	2.72
February	168.50	162.50	117.75	16.22	2.10
March	446.75	434.50	243.25	36.25	5.26

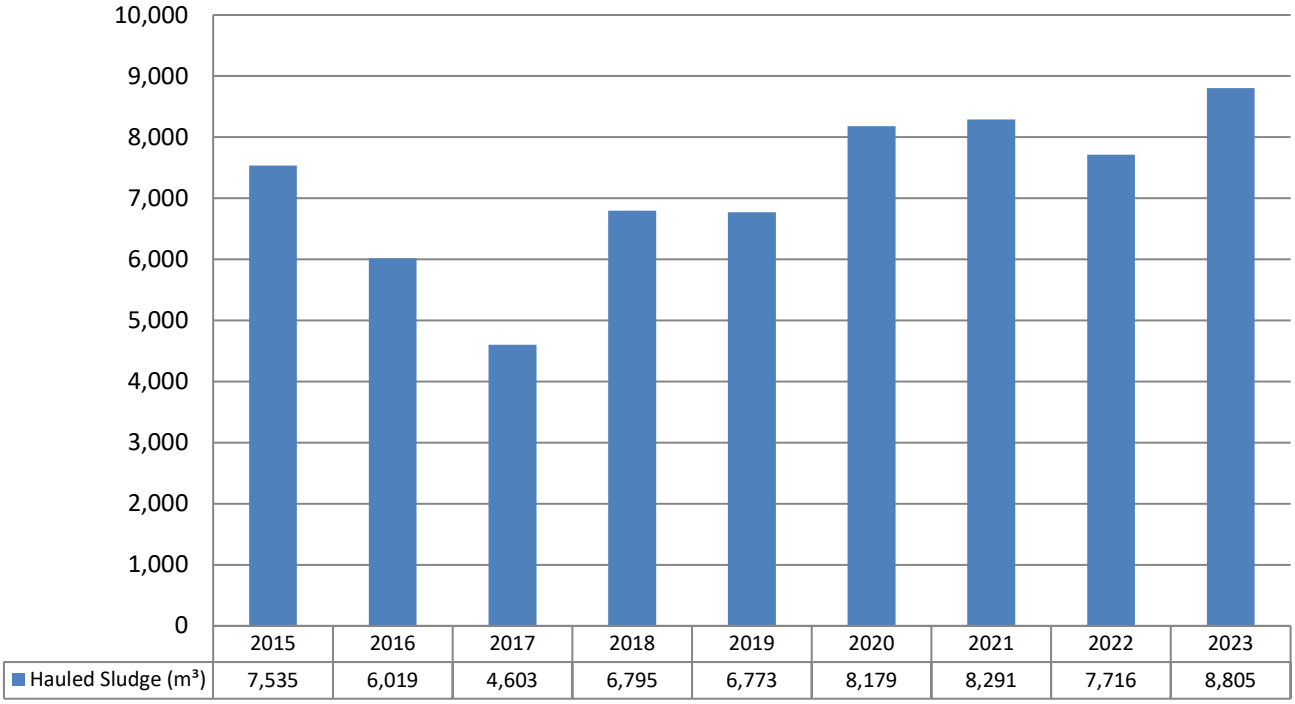
Month	Carbonaceous Biochemical Oxygen Demand - CBOD5 (mg/L)	Biochemical Oxygen Demand - BOD5 (mg/L)	Total Suspended Solids – TSS (mg/L)	Total Kjeldahl Nitrogen – TKN (mg/L)	Total Phosphorus – TP (mg/L)
April	279.75	283.00	132.50	17.02	2.48
May	231.00	275.40	130.20	17.46	2.35
June	171.75	193.75	134.50	24.58	2.43
July	299.00	354.50	248.75	23.22	2.83
August	517.20	599.60	308.80	29.58	3.54
September	481.75	491.75	253.25	21.65	2.20
October	406.00	430.00	227.20	17.66	2.39
November	327.25	399.00	189.00	18.85	1.95
December	367.25	396.50	196.00	20.52	2.11

(g) The total volume of sludge generated in 2023 was 8804.92 m^3 which was a 14.1% increase in the amount of sludge generated in 2022. Shepherd Environmental Services has been contracted to haul, land apply and store the Biosolids on their approved sites and certified holding lagoon during the winter.

Graph 13: 2023 Monthly Sludge Volumes



Graph 14: Historical Sludge Volume Comparisons



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Hauled Sludge (m^3)	7,535	6,019	4,603	6,795	6,773	8,179	8,291	7,716	8,805

The anticipated volume of biosolids for the next reporting period is expected to be appreciably similar to this reporting period and no change is expected from the current sludge handling methods and disposal areas currently utilized.

Refer to **Appendix V**: Biosolids Summary for biosolids sampling results.

(h) There were no complaints received by the Owner or Operating Authority in 2023 in relation to the wastewater treatment facility, however there was one for the collection system as noted below.

(i) A summary of a By-pass, Spill or Abnormal Discharge Events

Bypasses

There were not any bypasses at the Bobcaygeon WWTP during 2023.

Spills

There were not any spills at the Bobcaygeon WWTP during 2023.

Overflows

There were not any overflows at the Bobcaygeon WWTP or pumping stations in 2023.

Abnormal Discharge Events
There were not any abnormal discharge events at the Bobcaygeon WWTP in 2023.

Refer to **Appendix VI: Bypasses, Overflows, Spills or Abnormal Events** for copies of the quarterly Bypass and Overflow reports, and Notice of Exceedance submitted to the Ministry of the Environment, Conservation and Parks.

(j) There were not any Notices of Modifications to Sewage Works initiated, worked on or completed in 2023.

(k) A summary of all modifications completed as a result of Schedule B, Section 3 are included in **Appendix III: Maintenance Summary**; and

(l) The Water Supervisor has not requested any additional information be included in this report.

Environmental Compliance Approval (ECA) No. 141-W601

4.6 (a) a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.

There are no required monitoring data requirements for the Bobcaygeon Sewage Collection System.

4.6 (b) a summary of any operating problems encountered and corrective actions taken.

A summary of any operating problems encountered within the Bobcaygeon Sewage Collection System are included in **Table 2: Bobcaygeon WWTP Operational Challenges above**

4.6 (c) a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.

Calibrations on effluent monitoring equipment were performed by Franklin Empire in August 2023 for equipment located at the Bobcaygeon Wastewater Treatment Plant and associated Pumping Stations, as required. Refer to **Appendix IV: Calibration Report**

Attached is **Appendix III: WMS Work Order Summary**, a Work Order Summary report, showing all preventive and corrective maintenance activities performed at the Bobcaygeon WWTP, including the collection system, during 2023.

4.6 (d) a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.

August 1, 2023 – Resident called to report sewer odours coming from Bobcaygeon Fairgrounds following an event held at the Fairgrounds over the weekend. When the call was received the odours were no longer noticeable. Resident was advised to call right away when noticeable so it can be investigated.

4.6 (e) a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.

There were no Alterations made to the Bobcaygeon Sewage Collection System in 2023.

4.6 (f) a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including:

i) Dates;
ii) Volumes and durations;
iii) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli;
iv) Disinfection, if any; and
v) Any adverse impact(s) and any corrective actions, if applicable.

The Bobcaygeon Sewage Collection system did not experience any collection system Overflows or Spills in 2023.

4.6 (g) a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable:

i) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted

Annually manhole inspections are completed by City operations staff within the collection systems to identify any deficiencies that may result in excess flows increasing the risk of potential overflows. In an effort to reduce all excess flows, the City has an annual manhole rehabilitation program which includes but is not limited to grouting, moduloc replacement and frame and cover replacements.

Operationally, where manholes are located in lower lying areas and are at risk of being submerged and contributing to inflow, rain bladders are installed to prevent excess water from entering the system, further reducing the risk of overflow.

During the 2023 reporting period there were no incidents of a bypass or overflow within the sanity sewer system or the WWTP. However, the following operational activities were performed to help reduce overflow potential.

MH1725 Cole Street – Infiltration around downstream pipe repaired with grouting.
MH2447 Ellard Court – Infiltration repaired with grouting.
MH1710 Balaclava St. – replace 3” moduloc and frame/cover
MH1904 William St. – replace frame/cover
MH1668 Prince St. W – replace 12” moduloc and frame/cover

MH1993 King St. W – replace 10” moduloc and frame/cover

In addition to the operational maintenance activities peformed in 2023, a capital project was undertaken in 2023/2024 to rehabiliate a number of deficiencies that were identified by CCTV inspection completed in 2022. The overall capital investment was approximately $500,000.

There are no large scale capital projects to eliminate bypasses or overflows forecasted for the 2024 reporting period, however there is an operational budget of $15,000 available for any necessary operational repairs.

ii) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP’s timelines.

N/A

iii) An assessment of the effectiveness of each action taken.

N/A

iv) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives.

N/A

v) Public reporting approach including proactive efforts

SOP WWC02 Waterwater Bypass/Overflow Notification Procedure has been developed and has been in practice since 2021, which clearly outlines all reporting protocols to both regulatory agencies and the public in various situations. This procedure was developed in consultation with Ontario Clean Water Agency, Ministry of Environment, Conservation and Parks and Ministry of Health.

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Appendix I:
Performance Assessment Report

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Performance Assessment Report

From 1/1/2023 to 12/31/2023

6005 BOBCAYGEON WASTEWATER TREATMENT PLANT 110002498

	1 / 2023	2/ 2023	3/ 2023	4/ 2023	5/ 2023	6/ 2023	7/ 2023	8/ 2023	9/ 2023	10/ 2023	11/ 2023	12/ 2023	<--Total-->	<--Avg-->	<--Max-->	<-Criteria->
Flows																
Raw Flow: Total - Raw m³/d	88,818.00	69,323.00	75,463.00	117,918.00	91,916.00	75,143.00	76,760.00	74,116.00	68,769.00	69,038.50	69,497.00	66,064.60	942,826.10			0.00
Raw Flow: Avg - Raw m³/d	2,865.10	2,475.82	2,434.29	3,930.60	2,965.03	2,504.77	2,476.13	2,390.84	2,292.30	2,227.05	2,316.57	2,131.12		2,583.09		
Raw Flow: Max - Raw m³/d	4,590.00	3,659.00	3,125.00	5,586.00	4,232.00	3,102.00	2,965.00	2,716.00	2,592.00	2,783.00	2,714.00	2,578.00			5,586.00	0.00
Raw Flow: Count - Raw m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Eff. Flow: Total - Eff m³/d	88,818.00	69,323.00	75,463.00	117,918.00	91,916.00	75,143.00	76,760.00	74,116.00	68,769.00	69,038.50	69,497.00	66,064.60	942,826.10			0.00
Eff. Flow: Avg - Eff m³/d	2,865.10	2,475.82	2,434.29	3,930.60	2,965.03	2,504.77	2,476.13	2,390.84	2,292.30	2,227.05	2,316.57	2,131.12		2,583.09		
Eff. Flow: Max - Eff m³/d	4,590.00	3,659.00	3,125.00	5,586.00	4,232.00	3,102.00	2,965.00	2,716.00	2,592.00	2,783.00	2,714.00	2,578.00			5,586.00	0.00
Eff Flow: Count - Eff m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Carbonaceous Biochemical Oxygen Demand: CBOD																
Raw: Avg cBOD5 - Raw mg/L	318.40	168.50	446.75	279.75	231.00	171.75	299.00	517.20	481.75	406.00	327.25	367.25		334.55	517.20	0.00
Raw: # of samples of cBOD5 - Raw	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg cBOD5 - Eff mg/L	7.20	5.00	< 6.25	< 4.25	3.40	8.25	4.25	< 6.20	< 5.00	< 3.60	< 6.50	< 3.75		5.29	8.25	25.00
Eff: # of samples of cBOD5 - Eff	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: cBOD5 - Eff kg/d	20.629	12.379	< 15.214	< 16.705	10.081	20.664	10.524	14.823	< 11.462	< 8.017	< 15.058	< 7.992		13.66	20.66	
Percent Removal: cBOD5 - Raw %	97.74	97.03	98.60	98.48	98.53	95.20	98.58	98.80	98.96	99.11	98.01	98.98		98.17	99.11	0.00
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Raw mg/L	395.60	162.50	434.50	283.00	275.40	193.75	354.50	599.60	491.75	430.00	399.00	396.50		368.01	599.60	0.00
Percent Removal: BOD5 - Raw %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Total Suspended Solids: TSS																
Raw: Avg TSS - Raw mg/L	242.40	117.75	243.25	132.50	130.20	134.50	248.75	308.80	253.25	227.20	189.00	196.00		201.97	308.80	0.00
Raw: # of samples of TSS - Raw	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TSS - Eff mg/L	12.80	5.75	9.00	7.75	4.60	14.75	7.00	14.40	11.25	8.00	12.25	5.00		9.42	14.75	25.00
Eff: # of samples of TSS - Eff	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TSS - Eff kg/d	36.673	14.236	21.909	30.462	13.639	36.945	17.333	34.428	25.788	17.816	28.378	10.656		24.34	36.95	
Percent Removal: TSS - Raw %	94.72	95.12	96.30	94.15	96.47	89.03	97.19	95.34	95.56	96.48	93.52	97.45		95.11	97.45	0.00
Total Phosphorus: TP																
Raw: Avg TP - Raw mg/L	2.72	2.10	5.26	2.48	2.35	2.43	2.83	3.54	2.20	2.39	1.95	2.11		2.70	5.26	0.00
Raw: # of samples of TP - Raw	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TP - Eff mg/L	< 0.07	< 0.06	0.08	< 0.04	0.06	0.15	0.09	0.09	0.08	0.11	0.10	< 0.05		< 0.08	< 0.15	1.00
Eff: # of samples of TP - Eff	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TP - Eff kg/d	< 0.195	< 0.136	0.195	< 0.167	0.190	0.376	0.217	0.206	0.189	0.249	0.220	< 0.101		< 0.21	< 0.38	
Percent Removal: TP - Raw %	97.50	97.38	98.48	98.28	97.27	93.83	96.91	97.57	96.25	95.31	95.13	97.75		96.81	98.48	0.00
Nitrogen Series																
Raw: Avg TKN - Raw mg/L	20.14	16.23	36.25	17.03	17.46	24.58	23.23	29.58	21.65	17.66	18.85	20.53		21.93	36.25	0.00
Raw: # of samples of TKN - Raw	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TAN - Eff mg/L	1.62	4.05	3.80	4.20	11.66	16.13	6.33	6.84	7.80	9.04	8.85	5.95		7.20	16.13	
Eff: # of samples of TAN - Eff	5.00	4.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	52.00			0.00
Loading: TAN - Eff kg/d	4.641	10.027	9.250	16.509	34.572	40.389	15.662	16.353	17.880	20.133	20.502	12.680		18.59	40.39	
Disinfection																
Eff: GMD E. Coli - Eff cfu/100mL	3.95	3.31	6.88	7.14	2.30	14.73	4.90	41.91	6.05	3.92	11.47	9.86				200.00
Eff: # of samples of E. Coli - Eff	5.00	4.00	4.00	3.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	51.00			0.00

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Appendix II:
Acute Lethality Results

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 250673
Sample Number : 76269

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sample Date :	2023-01-24
Location :	Bobcaygeon ON	Time Collected :	08:31
Substance :	Final Effluent	Date Received :	2023-01-25
Sampling Method :	Grab	Time Received :	10:45
Sampled By :	M. James	Temperature at Receipt :	11 °C
Sample Description :	Clear, light yellow	Date Tested :	2023-01-25

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	8.6 days
Organism Batch :	Dm22-27	Average Brood Size :	33.9
Culture Mortality :	2.6% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-01-18	LC50 :	6.8 g/L
Organism Batch :	Dm22-27	95% Confidence Limits :	6.5 - 7.2 g/L
Analyst(s) :	NP	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 7.1 g/L

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 250673
Sample Number : 76269

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	6.8	8.1	923	20	94	200 mg/L

0 HOURS

Date & Time : 2023-01-25 13:40
Analyst(s) : KR (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	6.8	8.1	923	20	94	200
100	B	0	0	6.8	8.1	923	20	94	200
100	C	0	0	6.8	8.1	923	20	94	200
Control	A	0	0	8.2	8.9	535	20	100	150
Control	B	0	0	8.2	8.9	535	20	100	150
Control	C	0	0	8.2	8.9	535	20	100	150

Notes:

24 HOURS

Date & Time : 2023-01-26 13:40
Analyst(s) : NM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	21
100	B	–	0	–	–	–	21
100	C	–	0	–	–	–	21
Control	A	–	0	–	–	–	21
Control	B	–	0	–	–	–	21
Control	C	–	0	–	–	–	21

Notes:

48 HOURS

Date & Time : 2023-01-27 13:40
Analyst(s) : PG

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.3	8.5	949	20
100	B	0	0	8.2	8.3	947	20
100	C	0	0	8.2	8.4	967	20
Control	A	0	0	8.2	8.9	545	20
Control	B	0	0	8.2	8.8	547	20
Control	C	0	0	8.2	8.8	564	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ
Date : 2023-02-01

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13

Work Order : 250673
Sample Number : 76269

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sample Date :	2023-01-24
Location :	Bobcaygeon ON	Time Collected :	08:31
Substance :	Final Effluent	Date Received :	2023-01-25
Sampling Method :	Grab	Time Received :	10:45
Sampled By :	M. James	Temperature at Receipt :	11 °C
Sample Description :	Clear, light yellow	Date Tested :	2023-01-25

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	41.1 mm (±3.6)
Organism Batch :	T22-31	Range of Fork Lengths :	38 - 43 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.6 g (±0.2)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.5 - 0.7 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	18
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T22-31	LC50 :	3737 mg/L
Date Tested :	2023-01-03	95% Confidence Limits :	3386 - 4053 mg/L
Analyst(s) :	AJS, PG, AW, NM	Historical Mean LC50 :	3730 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3006 - 4628 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 250673
Sample Number : 76269

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*
Initial Water Chemistry (100%) :	6.9	7.6	932	15	82
After 30 min pre-aeration :	7.0	8.2	929	15	89

0 HOURS

Date & Time 2023-01-25 12:45
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*
100%	0	0	7.0	8.2	929	15	89
Control	0	0	8.2	9.3	792	15	100

Notes:

24 HOURS

Date & Time 2023-01-26 12:45
Analyst(s) : PG (PC)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2023-01-27 12:45
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2023-01-28 12:45
Analyst(s) : AJS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

96 HOURS

Date & Time 2023-01-29 12:45
Analyst(s) : AJS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	8.3	9.1	936	16
Control	0	0	8.4	9.1	766	16

Notes:

"–" = not measured/not required

Number impaired does not include number dead.

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-01-31

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 250673

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 6005 (Kawartha - Bobcaygeon WWTP)
Field Sampler Name (print): FINAL EFFLUENT
Signature:
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by: MIKE JAMES
Date/Time Shipped: JAN 24/2023

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon St
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-01/24	08:31	FINAL EFFLUENT	76269	11°C	✓				✓							✓		1 x 23L

For Lab Use Only
Received By: RC/AJS
Date: 2023-01-25
Time: 10:45
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 251437
Sample Number : 77482

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-04-27
Location :	Bobcaygeon ON	Sampling Time :	09:05
Substance :	FINAL EFFLUENT	Date Received :	2023-04-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	M. James	Temperature at Receipt :	16 °C
Sample Description :	Clear, pale yellow.	Date Tested :	2023-04-28

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	9 days
Organism Batch :	Dm23-07	Average Brood Size :	31.1
Culture Mortality :	0.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-04-25	LC50 :	6.2 g/L
Organism Batch :	Dm23-07	95% Confidence Limits :	6.0 - 6.4 g/L
Analyst(s) :	AJS, NM	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.8 - 7.4 g/L

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 251437
Sample Number : 77482

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.1	8.0	849	19	88	200 mg/L

0 HOURS

Date & Time : 2023-04-28 13:30
Analyst(s) : CFM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.1	8.0	849	19	88	200
100	B	0	0	7.1	8.0	849	19	88	200
100	C	0	0	7.1	8.0	849	19	88	200
Control	A	0	0	8.3	8.6	490	20	100	150
Control	B	0	0	8.3	8.6	490	20	100	150
Control	C	0	0	8.3	8.6	490	20	100	150

Notes:

24 HOURS

Date & Time : 2023-04-29 13:30
Analyst(s) : JGR

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2023-04-30 13:30
Analyst(s) : JJ

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.5	8.1	842	20
100	B	0	0	8.5	8.0	850	20
100	C	0	0	8.5	8.0	852	20
Control	A	0	0	8.3	7.9	514	20
Control	B	0	0	8.4	8.1	515	20
Control	C	0	0	8.4	8.1	512	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-05-02

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13

Work Order : 251437
Sample Number : 77482

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-04-27
Location :	Bobcaygeon ON	Sampling Time :	09:05
Substance :	FINAL EFFLUENT	Date Received :	2023-04-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	M. James	Temperature at Receipt :	16 °C
Sample Description :	Clear, pale yellow.	Date Tested :	2023-04-28

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	36.8 mm (±5.4)
Organism Batch :	T23-07	Range of Fork Lengths :	33 - 40 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.3 g (±0.1)
Cumulative stock tank mortality rate :	0.3% (previous 7 days)	Range of Wet Weights :	0.2 - 0.4 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	19
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-07	LC50 :	3393 mg/L
Date Tested :	2023-04-25	95% Confidence Limits :	3087 - 3716 mg/L
Analyst(s) :	KR,PG,NM,JCS	Historical Mean LC50 :	4049 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3292 - 4980 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 251437
Sample Number : 77482

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.0	8.2	904	15	87
After 30 min pre-aeration :	7.1	8.6	906	15	92

0 HOURS

Date & Time 2023-04-28 13:05
Analyst(s) : JCS/NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.1	8.6	906	15	92
Control	0	0	8.3	9.5	776	15	100

Notes:

24 HOURS

Date & Time 2023-04-29 13:05
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2023-04-30 13:05
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2023-05-01 13:05
Analyst(s) : JCS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2023-05-02 13:05
Analyst(s) : JCS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	8.4	8.7	903	15
Control	0	0	8.3	9.2	758	15

Notes:

"–" = not measured/not required

Number impaired does not include number dead.

[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-05-03

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 251437

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 6005 (Kawartha - Bobcaygeon WWTP)

Field Sampler Name (print): MIKE JAMES

Signature:

Affiliation: Ontario Clean Water Agency

Sample Storage (prior to shipping): N/A

Custody Relinquished by:

Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon St
Lindsay, ON
K9V4R3

Phone: (705) 731-9125

Fax: (705) 324-9374

Contact: Julie Mather

Sample Identification					Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023/04/27	09:05	FINAL EFFLUENT	74821	16°C	✓				✓							✓		1 x 23L

For Lab Use Only

Received By: JWXD

Date: 2023-04-28

Time: 11:50

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 252643
Sample Number : 79313

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-09-12
Location :	Bobcaygeon ON	Sampling Time :	07:10
Substance :	Final Effluent	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	M. James	Temperature at Receipt :	18 °C
Sample Description :	Clear, yellow	Date Tested :	2023-09-13

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	10.4 days
Organism Batch :	Dm23-17	Average Brood Size :	42.2
Culture Mortality :	0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-09-12	LC50 :	6.3 g/L
Organism Batch :	Dm23-17	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	PG, NP	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.6 - 7.4 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 252643
Sample Number : 79313

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.1	7.4	597	20	84	160 mg/L

0 HOURS

Date & Time : 2023-09-13 15:15
Analyst(s) : SV/MEP (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.1	7.4	597	20	84	160
100	B	0	0	7.1	7.4	597	20	84	160
100	C	0	0	7.1	7.4	597	20	84	160
Control	A	0	0	8.3	8.3	448	20	96	140
Control	B	0	0	8.3	8.3	448	20	96	140
Control	C	0	0	8.3	8.3	448	20	96	140

Notes:

24 HOURS

Date & Time : 2023-09-14 15:15
Analyst(s) : SV

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2023-09-15 15:15
Analyst(s) : JW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.3	8.4	597	20
100	B	0	0	8.2	8.6	605	20
100	C	0	0	8.2	8.8	599	20
Control	A	0	0	8.3	8.8	461	20
Control	B	0	0	8.3	8.7	453	20
Control	C	0	0	8.3	8.7	456	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-09-20

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13

Work Order : 252643
Sample Number : 79313

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-09-12
Location :	Bobcaygeon ON	Sampling Time :	07:10
Substance :	Final Effluent	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	M. James	Temperature at Receipt :	18 °C
Sample Description :	Clear, yellow	Date Tested :	2023-09-14

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	38.8 mm (±3.7)
Organism Batch :	T23-18	Range of Fork Lengths :	36 - 41 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.5 g (±0.2)
Cumulative stock tank mortality rate :	1% (previous 7 days)	Range of Wet Weights :	0.4 - 0.6 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	18
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-18	LC50 :	3247 mg/L
Date Tested :	2023-09-07	95% Confidence Limits :	2866 - 3614 mg/L
Analyst(s) :	AJS, DT, KR, NM	Historical Mean LC50 :	3683 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2921 - 4643 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 252643
Sample Number : 79313

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.1	7.5	612	16	80
After 30 min pre-aeration :	7.3	8.5	615	16	90

0 HOURS

Date & Time 2023-09-14 10:10
Analyst(s) : DT (AJS)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.3	8.5	615	16	90
Control	0	0	8.2	9.7	718	14	100

Notes:

24 HOURS

Date & Time 2023-09-15 10:10
Analyst(s) : DT (NM)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	14
Control	0	0	–	–	–	14

Notes:

48 HOURS

Date & Time 2023-09-16 10:10
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2023-09-17 10:10
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2023-09-18 10:10
Analyst(s) : KP

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	8.1	9.1	621	15
Control	0	0	8.2	9.1	690	15

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2023-09-19

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 252643

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 6005 (Kawartha - Bobcaygeon WWTP)
Field Sampler Name (print): MIKE JAMES
Signature:
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon St
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested											Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-09-12	07:10	FINAL EFFLUENT	79313	18°C	✓				✓							✓		1 x 2 3L

For Lab Use Only
Received By: NM/AJS
Date: 2023-09-13
Time: 13:00
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

Test Report Revision

Client:	Ontario Clean Water Agency, Kawartha Hub
Address:	123 Esat St. S, P.O. Box 279
Sample Number :	79313
Test Description:	*Clear, yellow*

Revision Requested By: [X] Internal Audit [ ] Client [ ] External Audit

Description of Report Revision(s):

A deviation was not added under Comments on Page 1 of the Rainbow Trout report.

Remedial Action(s):

The deviation was added to the Comment section of the report . Revision #1 was added to the header on page 1 & 2.

Attachment(s) :

Revised test report.

J. Johns	Lab Technician	2023-09-28
Name	*Title*	*Date*

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13
Revision #1

Work Order : 252643
Sample Number : 79313

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-09-12
Location :	Bobcaygeon ON	Sampling Time :	07:10
Substance :	Final Effluent	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	M. James	Temperature at Receipt :	18 °C
Sample Description :	Clear, yellow	Date Tested :	2023-09-14

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	38.8 mm (±3.7)
Organism Batch :	T23-18	Range of Fork Lengths :	36 - 41 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.5 g (±0.2)
Cumulative stock tank mortality rate :	1% (previous 7 days)	Range of Wet Weights :	0.4 - 0.6 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	18
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	Yes (see 'COMMENTS')

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-18	LC50 :	3247 mg/L
Date Tested :	2023-09-07	95% Confidence Limits :	2866 - 3614 mg/L
Analyst(s) :	AJS, DT, KR, NM	Historical Mean LC50 :	3683 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2921 - 4643 mg/L

COMMENTS

Noted Deviation(s): Organisms used for testing had not fully completed the required 14 day post-treatment waiting period as specified in the test method cited above, at the time of test initiation. There were no other unusual conditions, and the results are considered to be valid.

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 252643
Sample Number : 79313

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.1	7.5	612	16	80
After 30 min pre-aeration :	7.3	8.5	615	16	90

0 HOURS

Date & Time 2023-09-14 10:10
Analyst(s) : DT (AJS)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.3	8.5	615	16	90
Control	0	0	8.2	9.7	718	14	100

Notes:

24 HOURS

Date & Time 2023-09-15 10:10
Analyst(s) : DT (NM)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	14
Control	0	0	–	–	–	14

Notes:

48 HOURS

Date & Time 2023-09-16 10:10
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2023-09-17 10:10
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2023-09-18 10:10
Analyst(s) : KP

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	8.1	9.1	621	15
Control	0	0	8.2	9.1	690	15

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2023-09-28

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 252643

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 6005 (Kawartha - Bobcaygeon WWTP)
Field Sampler Name (print): MIKE JAMES
Signature:
Affiliation: Ontario Clean Water Agency
Sample Storage (prior to shipping): N/A
Custody Relinquished by:
Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon St
Lindsay, ON
K9V4R3

Phone: (705) 731-9125
Fax: (705) 324-9374
Contact: Julie Mather

Sample Identification					Analyses Requested											Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-09-12	07:10	FINAL EFFLUENT	79313	18°C	✓				✓							✓		1 x 2 3L

For Lab Use Only
Received By: NM/AJS
Date: 2023-09-13
Time: 13:00
Storage Location:
Storage Temp.(°C)

Please list any special requests or instructions:

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 253373
Sample Number : 80431

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-11-21
Location :	Bobcaygeon ON	Sampling Time :	08:22
Substance :	Final Effluent	Date Received :	2023-11-22
Sampling Method :	Grab	Time Received :	12:45
Sampled By :	M. James	Temperature at Receipt :	13 °C
Sample Description :	Clear, yellow.	Date Tested :	2023-11-22

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	7.8 days
Organism Batch :	Dm23-22	Average Brood Size :	35.9
Culture Mortality :	1.0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-11-21	LC50 :	6.7 g/L
Organism Batch :	Dm23-22	95% Confidence Limits :	6.4 - 7.0 g/L
Analyst(s) :	MEP, FM	Historical Mean LC50 :	6.3 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.7 - 7.1 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 253373
Sample Number : 80431

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	6.9	7.3	599	20	83	160 mg/L

0 HOURS

Date & Time : 2023-11-22 13:30
Analyst(s) : FM (PG)/PG

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	6.9	7.3	599	20	83	160
100	B	0	0	6.9	7.3	599	20	83	160
100	C	0	0	6.9	7.3	599	20	83	160
Control	A	0	0	8.3	8.8	461	20	100	130
Control	B	0	0	8.3	8.8	461	20	100	130
Control	C	0	0	8.3	8.8	461	20	100	130

Notes:

24 HOURS

Date & Time : 2023-11-23 13:30
Analyst(s) : PG

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2023-11-24 13:30
Analyst(s) : FM (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	8.0	7.6	614	21
100	B	0	0	8.0	7.7	612	21
100	C	0	0	8.0	7.7	611	21
Control	A	0	0	8.2	7.9	454	21
Control	B	0	0	8.2	8.0	453	21
Control	C	0	0	8.2	8.0	453	21

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-11-28

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13

Work Order : 253373
Sample Number : 80431

SAMPLE IDENTIFICATION

Company :	Ontario Clean Water Agency, Kawartha Hub	Sampling Date :	2023-11-21
Location :	Bobcaygeon ON	Sampling Time :	08:22
Substance :	Final Effluent	Date Received :	2023-11-22
Sampling Method :	Grab	Time Received :	12:45
Sampled By :	M. James	Temperature at Receipt :	13 °C
Sample Description :	Clear, yellow.	Date Tested :	2023-11-23

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	36.5 mm
Organism Batch :	T23-25	Range of Fork Lengths :	33 - 40 mm
Control Sample Size :	10	Mean Wet Weight :	0.4 g
Cumulative stock tank mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.2 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T23-25	LC50 :	3370 mg/L
Date Tested :	2023-11-15	95% Confidence Limits :	3197 - 3551 mg/L
Analyst(s) :	AJS, PG	Historical Mean LC50 :	3509 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	2938 - 4189 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 253373
Sample Number : 80431

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	6.8	7.5	619	15	76
After 30 min pre-aeration :	6.9	7.6	601	15	78

0 HOURS

Date & Time 2023-11-23 8:50
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	6.9	7.6	601	15	78
Control	0	0	8.4	9.6	739	15	100

Notes:

24 HOURS

Date & Time 2023-11-24 8:50
Analyst(s) : DT (NM)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

48 HOURS

Date & Time 2023-11-25 8:50
Analyst(s) : NM

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2023-11-26 8:50
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2023-11-27 8:50
Analyst(s) : JW

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	7.9	8.8	629	15
Control	0	0	8.3	8.7	681	15

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2023-11-28

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 253373

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number: 6005 (Kawartha - Bobcaygeon WWTP)

Field Sampler Name (print): MIKE JAMES

Signature:

Affiliation: Ontario Clean Water Agency

Sample Storage (prior to shipping): N/A

Custody Relinquished by:

Date/Time Shipped:

Client: Ontario Clean Water Agency
Lindsay WWTP
48 Lagoon St
Lindsay, ON
K9V4R3

Phone: (705) 731-9125

Fax: (705) 324-9374

Contact: Julie Mather

Sample Identification					Analyses Requested												Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	RBT Single Conc. pH Stabilization	RBT LC50 pH Stabilization	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Pseudokirchneriella subcapitata* Growth	Ammonia	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023/11/21	08:22	FINAL EFFLUENT	80431	13°C	✓		X		✓							✓		1 x 2.3L
						(*)												

For Lab Use Only

Received By: JW

Date: 2023-11-22

Time: 12:45

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:

(*) No pH stabilization as per client email. CW 2023-11-22

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix III:
Maintenance Summary

Work Order	Description
3108771	ESA Inspection Defects, Repair
2822603	Blower 1, Service, and Repair Pressure Gauge Output Line
2822605	Blower 2, Service, and Replace Air Filter, Repair Motor Tension Bolt
2822607	Blower 3, Service, and Replace Air Filter
3206895	Raw Composite Sampler Installation
3288634	Aerobic Digester Interior/Exterior Inspection and Anode Installation
3385989	Radio and Network Troubleshooting, Reinstall Antenna, Radio & Server Relocation
3386106	After Hours Barscreen Cleaning
3433307	Waste Activated Sludge (WAS) Valve Actuator Replacement
3433475	Train 1 North DO Probe, Replacement
3575193	SPS 5, Pump Submersible 01, Replacement
3662042	Aeration 1 Blower, Blowing Belts, Ventilation Clogged
3662702	Alum Line Leaking, Repair
3664076	Backflow Preventer Leaking, Repair
3665446	Train 2 Sampler Heat Trace, Replace
3705165	Emergency Lighting Fail, Repair

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix IV:
Calibration Reports

Franklin Empire Inc,
550 Braidwood Ave. Unit 4.
Peterborough ON K9J 1W1, CANADA

Tel: (705) 745-1626
Fax: (705) 745-3493

OCWA Kawartha

2023 Calibrations Bobcaygeon WWTP

CALIBRATION REPORT

Report No.: OCWA 2023 FIT 402

Date: 24-Aug-23

SITE:	Bobcaygeon WWTP	**SERVICE DATE:**	24-Aug-23
PROCESS AREA:	WWTP Train 2 Outfall		
INSTR. TAG:	FIT 402	**TECHNICIAN:**	M Manley
MANUFACTURER:	Toshiba		
MODEL:	LF424	**JOB REFERENCE:**	OCWA 2023
SERIAL No.:	54241656		
OCWA CODE:	0000208987		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	%		**Type or EGU:**	mA	m3/d
Min:	0.00		**Min:**	4.00	0.00
Max:	100.00		**Max:**	20.00	3500.00
Size	12"	12 hz			
Ex Curr	0.1664A				

			Before Calibration		**After Calibration**	
%	**mA**	**Calculated**	**mA**	**m3/day**	**mA**	**m3/day**
0	4.00	0	4.00	6.6	4.00	6.6
50	12.00	1750	12.00	1757.2	12.00	1757.2
100	20.00	3500	20.00	3500.0	20.00	3500.0

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
Model:	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: No available velocity simulator for these mag flowmeters, performend internal flow cal using transmitter. Excitation 0.1663A.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: OCWA 2023 FIT 202

Date: 24-Aug-23

SITE:	Bobcaygeon WWTP	**SERVICE DATE:**	24-Aug-23
PROCESS AREA:	WWTP RAS/WAS Train 2	**TECHNICIAN:**	M Manley
INSTR. TAG:	FIT 202	**JOB REFERENCE:**	OCWA 2023
MANUFACTURER:	Toshiba		
MODEL:	LF424		
SERIAL No.:	54241658		
OCWA CODE:	0000208986		

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	%		**Type or EGU:**	mA	m3/d
Min:	0.00		**Min:**	4.00	0.00
Max:	100.00		**Max:**	20.00	6000.00
Size	6"	24 hz			
Ex Curr	0.1732A				

			Before Calibration		**After Calibration**	
%	**mA**	**Calculated**	**mA**	**m3/day**	**mA**	**m3/day**
0	4.00	0	4.00	10.6	4.00	10.60
50	12.00	3000	12.00	3008.0	12.00	3008.0
100	20.00	6000	20.00	6000.0	20.00	6000.0

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
Model:	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: No available velocity simulator for these mag flowmeters, performend internal flow cal using transmitter.
Excitation 0.1731A.
TOT 2373660 m3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: OCWA 2023 FIT 201

Date: 24-Aug-23

SITE:	Bobcaygeon WWTP
PROCESS AREA:	WWTP RAS/WAS Train 1
INSTR. TAG:	FIT 201
MANUFACTURER:	Toshiba
MODEL:	LF424
SERIAL No.:	54241659
OCWA CODE:	0000208985

SERVICE DATE:	24-Aug-23
TECHNICIAN:	M Manley
JOB REFERENCE:	OCWA 2023

Input	**(Test)**
Type:	%
Min:	0.00
Max:	100.00
Size	6"
Ex Curr	0.1038A

Output	**(Signal)**	**(Process)**
Type or EGU:	mA	m3/d
Min:	4.00	0.00
Max:	20.00	6000.00

			Before Calibration		**After Calibration**	
%	**mA**	**Calculated**	**mA**	**m3/day**	**m3/day**	**m3/day**
0	4.00	0	4.00	11.4	4.00	11.4
50	12.00	3000	12.00	3007.1	12.00	3007.1
100	20.00	6000	19.99	6000.0	19.99	6000.0

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
Model:	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: No available velocity simulator for these mag flowmeters, performend internal flow cal using transmitter. Excitation 0.1037A.

TOT 2346030 m3

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

CALIBRATION REPORT

Report No.: OCWA 2023 FIT 401

Date: 24-Aug-23

SITE:	Bobcaygeon WWTP
PROCESS AREA:	WWTP Outfall Train 1
INSTR. TAG:	FIT 401
MANUFACTURER:	Toshiba
MODEL:	LF424
SERIAL No.:	54241660
OCWA CODE:	0000208984

SERVICE DATE:	24-Aug-23
TECHNICIAN:	M Manley
JOB REFERENCE:	OCWA 2023

Input	**(Test)**		**Output**	**(Signal)**	**(Process)**
Type:	%		**Type or EGU:**	mA	m3/d
Min:	0.00		**Min:**	4.00	0.00
Max:	100.00		**Max:**	20.00	3500.00
Size	12"	24 hz			
Ex Curr	0.1606A				

			Before Calibration		**After Calibration**	
%	**mA**	**Calculated**	**mA**	**m3/day**	**m3/day**	**m3/day**
0	4.00	0	4.00	6.0	4.00	6.0
50	12.00	1750	12.01	1758.0	12.01	1758.0
100	20.00	3500	20.01	3500.0	20.01	3500.0

Calibration Equipment			
Type:	DMM		
Manufacturer:	Fluke		
Model:	Model 87		
Serial No.:	13440128		
Last Cal. Date:	Feb. 17, 2023		

Comments: No available velocity simulator for these mag flowmeters, performend internal flow cal using transmitter. Excitation 0.1605A.

AS FOUND: PASS **AS LEFT:** PASS

CERTIFIED BY:

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix V:
Biosolids Summary

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: AEROBIC
Solids and Nutrients

Facility: BOBCAYGEON WASTEWATER TREATMENT PLANT
Works: 6005
Period: 01/01/2023 to 12/01/2023

Facility Works Number:
Facility Name: *BOBCAYGEON WASTEWATER TREATMENT PLANT*
Facility Owner: *Municipality: City of Kawartha Lakes*
Facility Classification: *Class 2 Wastewater Treatment*
Receiver: *Big Bob Channel*
Service Population: *2472.0*
Total Design Capacity: *10440.0 m3/day*
Period Being Reported: 01/01/2023 12/01/2023

Note: all parameters in this report will be derived from the Bslq Station

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	**BOBCAYGEON WASTEWATER TREATMENT PLANT**									
Station	**Bslq Station only**									
Parameter Short Name	**HauledVol**	**TS**	**VS**	**TP**	**NH3p_NH4p_N**	**NO3-N**	**NO2-N**	**TKN**	**calculation in report - no T/S**	**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**		**Lab Published Month Mean**
Jan	676.540	23,900.000	19,600.000	280.000	39.200	0.300	0.600	1,780.000	19.750	83.000
Feb	532.750	26,300.000	22,600.000	440.000	103.000	0.300	1.800	2,160.000	51.650	150.000
Mar	544.650	31,300.000	27,500.000	400.000	124.350	0.300	0.200	2,310.000	62.325	125.000
Apr	582.000	37,750.000	31,400.000	442.250	209.250	0.300	5.550	2,612.500	104.775	137.000
May	525.300	37,200.000	31,100.000	582.000	203.000	0.300	4.200	2,670.000	101.650	142.000
Jun	905.700	20,900.000	17,300.000	317.000	211.000	3.000	3.000	1,525.000	107.000	74.500
Jul	616.500	15,766.667	13,100.000	215.333	122.667	3.000	3.000	1,133.333	62.833	53.000
Aug	1,156.500	17,900.000	14,800.000	251.333	97.833	3.000	3.000	1,383.333	50.417	68.333
Sep	1,027.360	12,700.000	11,000.000	151.000	75.400	3.000	3.000	1,020.000	39.200	50.000
Oct	454.630	15,600.000	13,500.000	246.000	135.000	3.000	3.000	1,290.000	69.000	61.000
Nov	1,114.990	28,000.000	23,500.000	425.000	180.000	3.000	3.000	1,560.000	91.500	86.000
Dec	489.200	36,500.000	30,600.000	646.000	97.100	3.000	3.000	2,490.000	50.050	184.000
Average	718.843	25,318.056	21,333.333	366.326	133.150	1.875	2.779	1,827.847	67.513	101.153
Total	8,626.120	303,816.667	256,000.000	4,395.917	1,597.800	22.500	33.350	21,934.167	810.150	1,213.833

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: AEROBIC
Metals and Criteria

Facility: BOBCAYGEON WASTEWATER TREATMENT PLANT
Works: 6005
Period: 01/01/2023 to 12/01/2023

Note: all parameters in this report will be derived from the Bslq Station

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	**BOBCAYGEON WASTEWATER TREATMENT PLANT**										
Station	**Bslq Station only**										
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	0.005	0.010	0.080	1.600	0.003	0.070	0.100	0.100	0.100	2.000
Feb	0.100	0.005	0.020	0.220	2.300	0.003	0.090	0.170	0.100	0.100	3.000
Mar	0.100	0.007	0.020	0.215	12.500	0.006	0.075	0.205	0.300	0.100	6.500
Apr	0.100	0.006	0.020	0.228	2.200	0.005	0.090	0.175	0.100	0.100	3.250
May	0.100	0.007	0.030	0.360	3.000	0.006	0.130	0.270	0.100	0.100	4.000
Jun	0.100	0.010	0.010	0.160	1.750	0.006	0.060	0.120	0.100	0.100	2.500
Jul	0.100	0.005	0.010	0.120	1.067	0.003	0.050	0.087	0.100	0.100	2.000
Aug	0.100	0.005	0.010	0.147	2.167	0.003	0.050	0.107	0.100	0.100	3.333
Sep	0.100	0.005	0.010	0.060	1.500	0.002	0.050	0.060	0.100	0.100	2.000
Oct	0.100	0.005	0.010	0.080	1.200	0.002	0.050	0.070	0.100	0.100	3.000
Nov	0.100	0.007	0.020	0.150	2.000	0.010	0.090	0.140	0.100	0.100	4.000
Dec	0.100	0.012	0.030	0.260	2.800	0.006	0.130	0.210	0.100	0.100	5.000
Average	0.100	0.007	0.017	0.173	2.840	0.005	0.078	0.143	0.117	0.100	3.382
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)	3.950	0.257	0.658	6.843	112.184	0.179	3.078	5.639	4.608	3.950	133.578

Ontario Clean Water Agency
Biosolids Quality Report - Liquid - Based on Last 4 Samples
Digestor Type: AEROBIC

Facility: BOBCAYGEON WASTEWATER TREATMENT PLANT
Works: 6005
Period: 01/01/2023 to 12/01/2023

Note: all parameters in this report will be derived from the Bslq Station

Parameter Short Name	Time Series	09/21/2023	10/12/2023	11/22/2023	12/18/2023	Average	Metal Concentrations in Sludge (mg/kg):	Max. Permissible Metal Concentrations (mg/kg of Solids):
As (mg/L)	Lab Published	0.100	0.100	0.100	0.100	0.100	4.310	170.000
Cd (mg/L)	Lab Published	0.005	0.005	0.007	0.012	0.007	0.302	34.000
Co (mg/L)	Lab Published	0.010	0.010	0.020	0.030	0.017	0.733	340.000
Cr (mg/L)	Lab Published	0.060	0.080	0.150	0.260	0.138	5.948	2,800.000
Cu (mg/L)	Lab Published	1.500	1.200	2.000	2.800	1.875	80.819	1,700.000
Hg (mg/L)	Lab Published	0.002	0.002	0.010	0.006	0.005	0.216	11.000
Mo (mg/L)	Lab Published	0.050	0.050	0.090	0.130	0.080	3.448	94.000
Ni (mg/L)	Lab Published	0.060	0.070	0.140	0.210	0.120	5.172	420.000
Pb (mg/L)	Lab Published	0.100	0.100	0.100	0.100	0.100	4.310	1,100.000
Se (mg/L)	Lab Published	0.100	0.100	0.100	0.100	0.100	4.310	34.000
Zn (mg/L)	Lab Published	2.000	3.000	4.000	5.000	3.500	150.862	4,200.000
E. Coli: Dry Wt (cfu/g)	Lab Published	503,937.000	217,949.000	135,714.000	197,260.000	232,862.042	E.Coli average is the GMD	
TS (mg/L)	Lab Published	12,700.000	15,600.000	28,000.000	36,500.000	23,200.000		
VS (mg/L)	Lab Published	11,000.000	13,500.000	23,500.000	30,600.000	19,650.000		
TP (mg/L)	Lab Published	151.000	246.000	425.000	646.000	367.000		
NO2-N (mg/L)	Lab Published	3.000	3.000	3.000	3.000	3.000		
TKN (mg/L)	Lab Published	1,020.000	1,290.000	1,560.000	2,490.000	1,590.000		
K (mg/L)	Lab Published	50.000	61.000	86.000	184.000	95.250		
NH3p_NH4p_N (mg/L)	Lab Published	75.400	135.000	180.000	97.100	121.875		
NO3-N (mg/L)	Lab Published	3.000	3.000	3.000	3.000	3.000		

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix VI:
Bypass, Overflow, Spills or Abnormal Events

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

Brad Jackson
Drinking Water Supervisor (A)
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

May 1, 2023

Dear Mr. Jackson:

Re: Bobcaygeon WWTP 2023 Q1 Bypass and Plant Overflow Event Report

Amended Environmental Compliance Approval #3028-AEUKDQ Sections 4(5) and 5(5) issued April 10, 2017 and Amended Environmental Compliance Approval #4705-AFRJQM Section 4(5) issued April 10, 2017 for the Bobcaygeon WWTP require a quarterly Bypass and Overflow report be submitted to the Water Supervisor no later than February 15, May 15, August 15, and November 15 each year.

There were no incidents of a Plant Overflow Event or Bypass Event at the Bobcaygeon WWTP during the first quarter of 2023 (January, February, and March).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Wesley Henneberry, OCWA - SPC Manager
Geoff Redden, OCWA – General Manager
Amber Hayter, City of Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Jacqueline Fuller, MECP – Drinking Water Supervisor (On Leave)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

Brad Jackson
Drinking Water Supervisor (A)
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

August 1, 2023

Dear Mr. Jackson:

Re: Bobcaygeon WWTP 2023 Q2 Bypass and Plant Overflow Event Report

Amended Environmental Compliance Approval #3028-AEUKDQ Sections 4(5) and 5(5) issued April 10, 2017 and Amended Environmental Compliance Approval #4705-AFRJQM Section 4(5) issued April 10, 2017 for the Bobcaygeon WWTP require a quarterly Bypass and Overflow report be submitted to the Water Supervisor no later than February 15, May 15, August 15, and November 15 each year.

There were no incidents of a Plant Overflow Event or Bypass Event at the Bobcaygeon WWTP during the second quarter of 2023 (April, May, and June).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, City of Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator
Jacqueline Fuller, MECP – Drinking Water Supervisor (On Leave)

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
Lindsay, ON K9V 4R3

Tel: 705-738-9734
www.ocwa.com

Brittney Wielgos
Drinking Water Supervisor
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

November 7, 2023

Dear Ms. Wielgos:

Re: Bobcaygeon WWTP 2023 Q3 Bypass and Plant Overflow Event Report

Amended Environmental Compliance Approval #3028-AEUKDQ Sections 4(5) and 5(5) issued April 10, 2017 and Amended Environmental Compliance Approval #4705-AFRJQM Section 4(5) issued April 10, 2017 for the Bobcaygeon WWTP require a quarterly Bypass and Overflow report be submitted to the Water Supervisor no later than February 15, May 15, August 15, and November 15 each year.

There were no incidents of a Plant Overflow Event or Bypass Event at the Bobcaygeon WWTP during the third quarter of 2023 (July, August, and September).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, City of Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

48 Lagoon Rd
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Brittney Wielgos
Drinking Water Supervisor
Peterborough District Office
Ministry of the Environment, Conservation and Parks
300 Water Street, 2nd Floor, South Tower
Peterborough, ON
K9J 3C7

February 1, 2024

Dear Ms. Wielgos:

Re: Bobcaygeon WWTP 2023 Q4 Bypass and Plant Overflow Event Report

Amended Environmental Compliance Approval #3028-AEUKDQ Sections 4(5) and 5(5) issued April 10, 2017 and Amended Environmental Compliance Approval #4705-AFRJQM Section 4(5) issued April 10, 2017 for the Bobcaygeon WWTP require a quarterly Bypass and Overflow report be submitted to the Water Supervisor no later than February 15, May 15, August 15, and November 15 each year.

There were no incidents of a Plant Overflow Event or Bypass Event at the Bobcaygeon WWTP during the fourth quarter of 2023 (October, November, and December).

Please contact me if you have any questions or comments.

Best regards,

Julie Mather
Process & Compliance Technician
Ontario Clean Water Agency
Kawartha Hub
(705) 731-9125

CC: Brent Martin, OCWA - Operations Manager
Julie Mulligan, OCWA - SPC Manager (A)
Geoff Redden, OCWA – General Manager
Amber Hayter, City of Kawartha Lakes – Manager, Water & Wastewater
Michelle Flaherty, Kawartha Lakes – Contract Coordinator