City of Brantford Wastewater System

Brantford Wastewater Treatment Plant

2023 Annual Performance Report

ECA #1860-9Q7LK9

Date: March 21, 2024

Table of Contents

Table of Tables

Table of Figures

1. Background

This report has been prepared in accordance with the terms and requirements set out in the City of Brantford's Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) #1860-9Q7LK9 issued on November 4, 2014 for the Brantford Wastewater Treatment Plant (WWTP). It covers the period from January 1 to December 31, 2023.

2. Description of Wastewater System

The WWTP is located at 385 Mohawk Street, Brantford, Ontario and is a Class IV conventional activated sludge facility that services a population of 104,688 residents, receiving a mixture of residential, industrial, commercial and institutional wastewater.

Raw sewage enters the plant via 2 trunk sewers and passes through influent channels into a two celled wet well with isolation sluice gates within the Raw Sewage Pumping Station. Four dry pit submersible pumps discharge raw sewage through recently installed magnetic flow meters to the top floor of the Preliminary Treatment Building. The Preliminary Treatment Building consists of two mechanically raked bar screens and one bypass screening channel. Two vortex grit removal systems allow for the removal of grit before flowing by gravity to Process Module 1 (PM #1) and Process Module 2 (PM #2). The screenings and grit are conveyed to dumpsters which are hauled to the landfill for disposal.

PM #1 consists of four circular primary clarifiers, two three-pass rectangular fine bubble aeration tanks and six circular secondary clarifiers. PM #2 consists of two rectangular primary clarifiers, two three-pass rectangular fine bubble aeration tanks and two circular secondary clarifiers. Air is delivered to the aeration systems by two 300HP turbo blowers, one 200HP turbo blower and one 300HP centrifugal blower. Ferric chloride is added near the end of the aeration basins for phosphorus precipitation. Secondary effluent from each PM flows through a Parshall flume with an ultrasonic flow measuring device before combining and entering a chlorine contact chamber for disinfection with Sodium Hypochlorite. De-chlorination with Sodium Bisulfite is completed downstream of the chlorine contact chamber before being discharged to the Grand River.

Waste activated sludge and primary sludge are co-thickened in the primary clarifiers before being pumped to two primary anaerobic digesters. Digested sludge overflows to a secondary digester for decanting before being pumped to three biosolids storage tanks prior to land application. The biosolids storage tanks are also equipped with decanting capability.

3. Monitoring Data

3.1. Flow Measurement

Both the raw sewage and effluent wastewater flow are measured by continuous on-line flow meters. The influent flow is measured by magnetic (MAG) flow meters (commissioned in April 2022) which are installed on the two forcemains between the RSPS and the PTB. The effluent flow is measured by Parshall flumes in the effluent of PM #1 and PM #2. For the purpose of this report the influent MAG meters are used to determine the raw loadings while the Parshall flumes are used to determine the final effluent loadings.

3.2. Raw Sewage Concentrations and Loadings

Raw sewage concentrations and loadings for each month of 2023 are summarized in Table 1.

Table 1 - Summary of Monthly Average Raw Sewage Concentrations and Loadings

Month	Average Daily Flows m^3/d	TSS mg/L	TSS kg/d	BOD_5 mg/L	BOD_5 kg/d	TP mg/L	TP kg/d	TKN mg/L	TKN kg/d
January	37598	240	9010	203.8	7663	5.3	198	41.6	1565
February	38625	287	11066	184.25	6882	5.2	202	44.6	1724
March	44488	206	9176	152	7355	4.0	179	35.6	1582
April	58136	201	11685	155.25	6181	2.9	170	27.0	1568
May	46334	189	8757	184.4	6862	3.8	174	29.9	1384
June	40572	206	8338	186.25	7543	4.3	175	32.0	1297
July	42060	214	9009	162.4	7732	3.5	145	34.8	1463
August	41926	218	9150	140.2	9186	4.6	193	37.6	1577
September	38556	234	9022	203	8933	4.3	165	35.6	1371
October	36619	264	9667	212	7677	4.3	158	40.0	1464
November	35674	287	10230	224	7591	5.5	195	46.5	1660
December	38503	295	11368	251.25	6714	6.3	242	49.7	1915
Average	41591	237	9707	188	7527	4.5	183	38	1547

3.3. Final Effluent Concentrations and Loadings

The final effluent concentrations and loadings are compared to the ECA objectives and limits to determine compliance. The City has also committed to meeting more stringent voluntary targets for total phosphorus (TP) and total ammonia nitrogen (TAN) established through the Grand River Water Management Plan (WMP). If all municipal WWTPs discharging into the Grand River achieve the voluntary targets, water quality in the Grand River and ultimately Lake Erie will be greatly improved.

Through the WMP, the Watershed-wide Wastewater Optimization Program (WWOP) was established, which the City is a partner in with other municipalities that discharge to the Grand River. The WWOP partners utilize optimization principles to make best use of municipal resources with a goal of achieving improved performance. The program also provides support to its municipal partners through technical assistance.

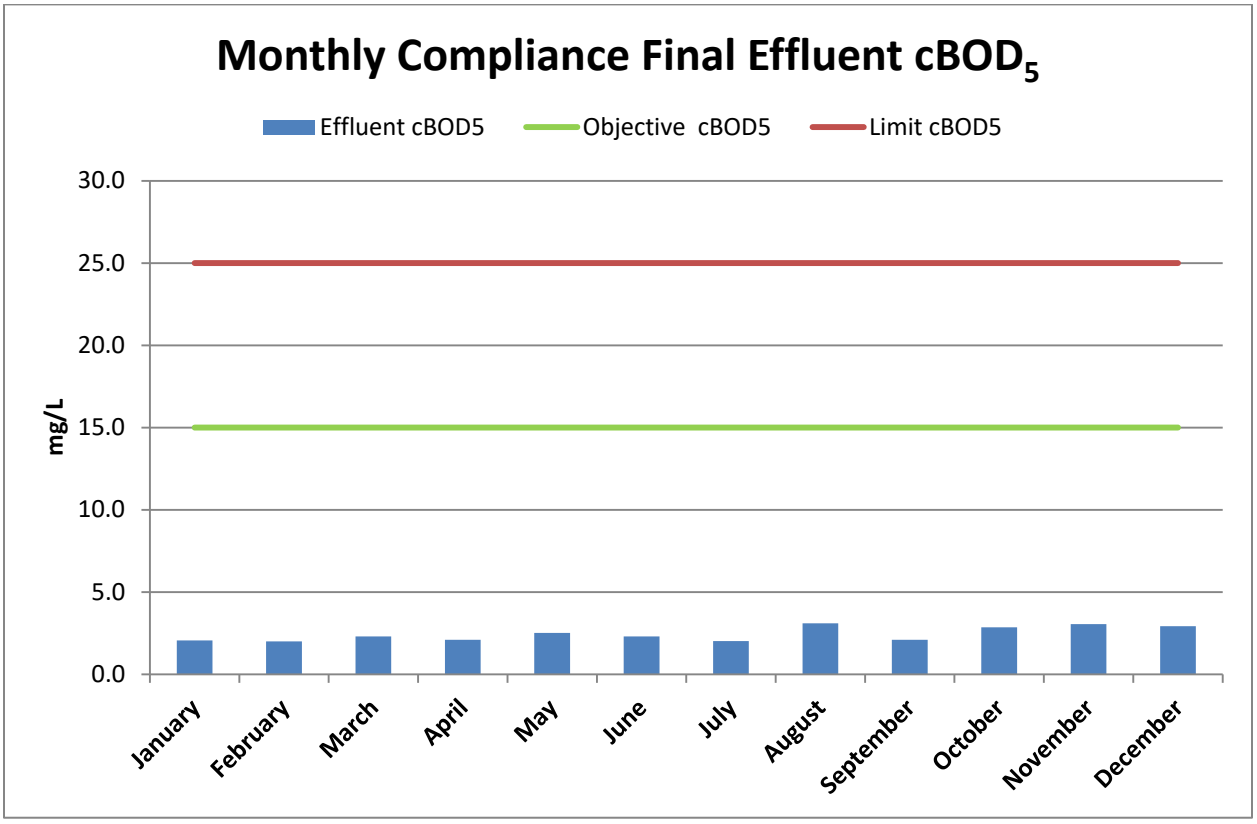
Required sampling parameters are summarized for each month of 2023 in Table 2.

Table 2 - Summary of Monthly Average Final Effluent Concentrations and Loadings

	TSS mg/L	TSS Loading kg/d	cBOD5 mg/L	cBOD5 Loading kg/d	TP mg/L	TP Loading kg/d	Total Ammonia Nitrogen mg/L	Calculated Unionized Ammonia mg/L	E. Coli (Geometric Mean Density) CFU/100mL	Total Chlorine Residual mg/L	Sodium Bisulfite Residual mg/L	pH No Units	Temp. Degrees Celsius
Objective	15		15		0.8					0			
Limit	25	2045	25	2045	1	81.8			200	0.02		6.00-9.5	
January	6.0	191	2.1	65	0.20	6.2	0.34	0.0016	7.7	0	2.5	6.89-7.52	11.7
February	6.8	224	2.0	66	0.21	6.8	0.45	0.0020	1.9	0	2.9	7-7.82	11.1
March	7.5	290	2.3	89	0.22	8.3	0.99	0.0040	3.6	0	2.0	7.07-7.61	11.6
April	6.3	321	2.1	108	0.14	7.1	0.31	0.0025	35.7	0	1.6	7.38-7.69	14.8
May	5.8	231	2.5	100	0.23	9.1	0.09	0.0011	24.0	0	2.2	7.42-7.75	17.1
June	4.8	163	2.3	79	0.25	8.6	0.10	0.0008	6.6	0	1.7	7.2-7.71	20.0
July	7.4	263	2.0	72	0.26	9.2	0.13	0.0026	16.9	0	2.0	7.3-7.75	21.7
August	7.8	273	3.1	109	0.23	8.2	0.10	0.0015	7.0	0	2.4	7.2-7.74	21.3
September	10.8	357	2.1	70	0.21	6.9	0.12	0.0011	11.2	0	1.8	7.06-7.71	20.7
October	9.8	325	2.9	95	0.21	7.0	0.31	0.0030	24.8	0	2.0	7.3-7.78	18.0
November	7.8	261	3.1	103	0.20	6.8	0.11	0.0016	43.6	0	2.2	7.47-7.93	15.8
December	6.8	231	2.9	100	0.16	5.6	0.10	0.0010	51.1	0	2.8	7.32-7.79	13.6
Average	7.3	261	2.4	88.0	0.21	7.5	0.26	0.0019	19.5	0.0	2.2	6.89-7.93	16.5

As identified in Table 2, all parameters with ECA limits and objectives were in compliance. The Total Residual Chlorine objective of 0.00 mg/L was achieved in all months. The detection limit for the HACH low-range pocket Colorimeter II (used at the WWTP) is from 0.02 to 2.00 mg/L for total and free chlorine. Therefore consistently measuring any values below the low range value of 0.02 mg/L is difficult. Operations staff measures the sodium bisulfite residual in the same final effluent sample. The presence of sodium bisulfite indicates the absence of total chlorine in the final effluent. For all 12 months, there was a sodium bisulfite residual present to ensure adequate removal of any total residual chlorine in the final effluent (Table 2).

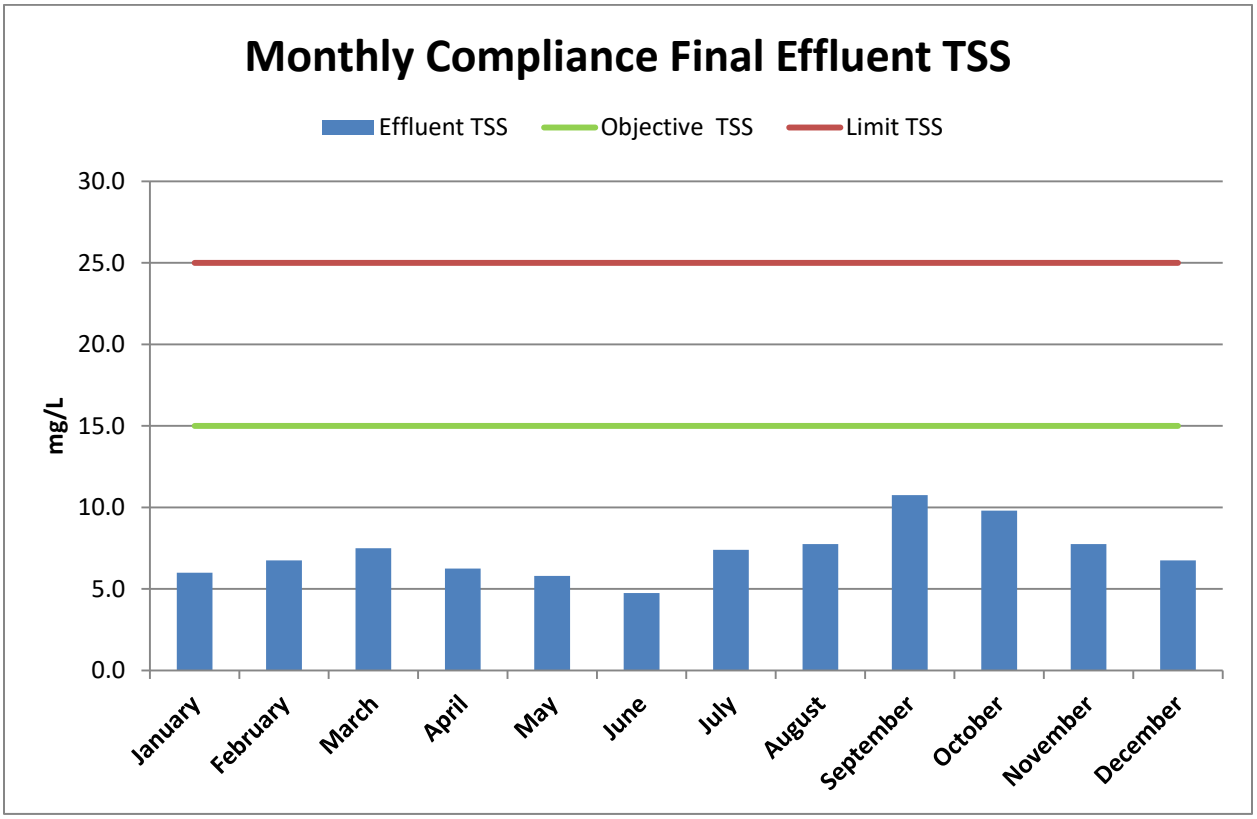
Figure 1 - Monthly Average Final Effluent cBOD5



Comments:

- Figure 1 is a trend of the monthly average final effluent $cBOD_5$.
- The monthly average final effluent $cBOD_5$ concentrations met the ECA limit and objective in 2023.
- All monthly average results were less than 5 mg/L.

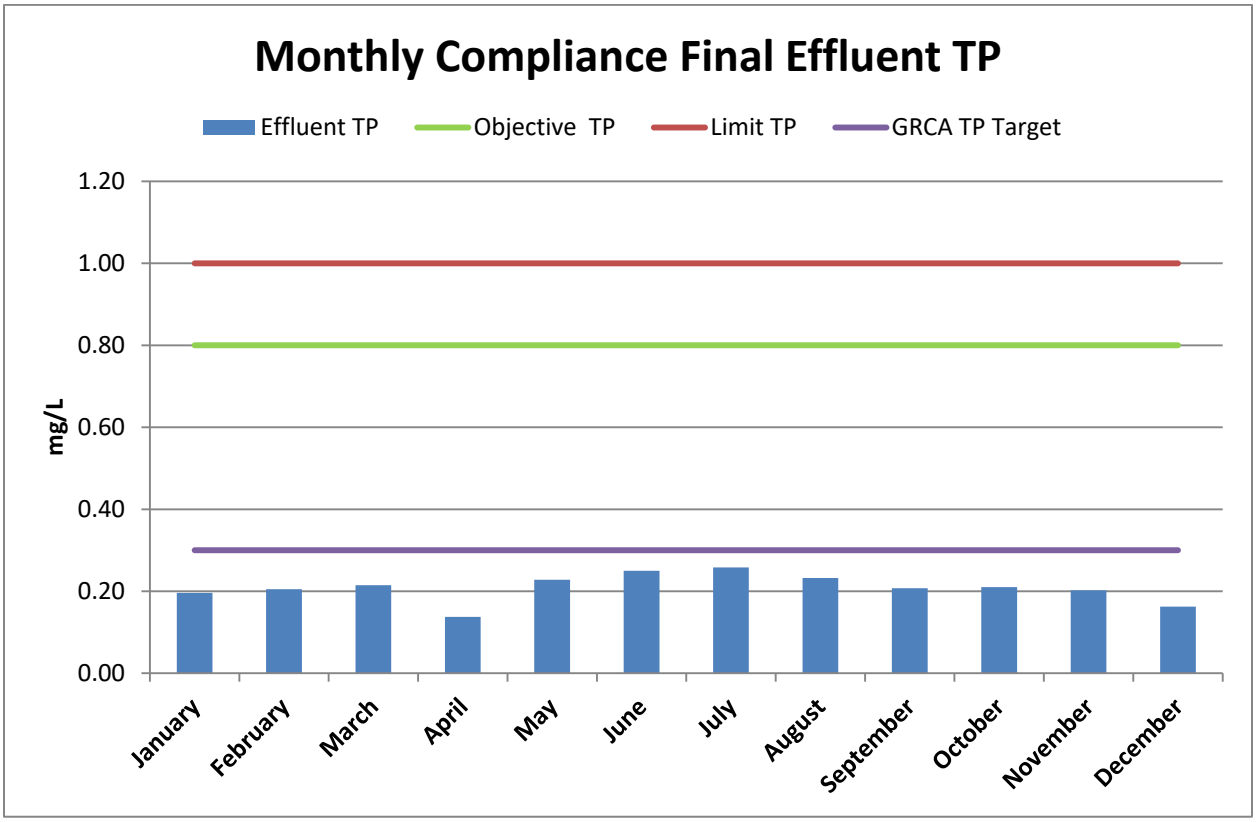
Figure 2 - Monthly Average Final Effluent TSS



Comments:

- Figure 2 is a trend of the monthly average final effluent TSS.
- The monthly average final effluent TSS concentrations met the ECA limit and objective in 2023.
- All monthly average results were less than 15 mg/L.

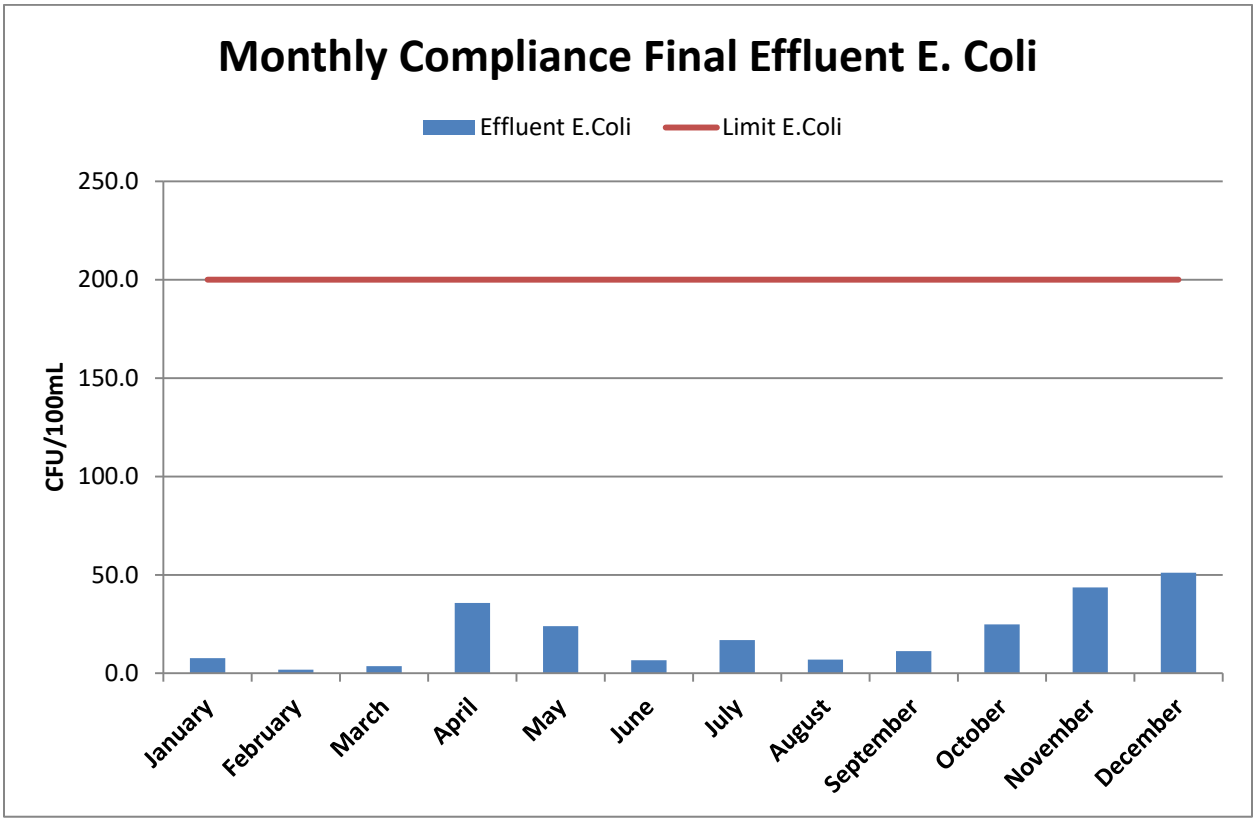
Figure 3 - Monthly Average Final Effluent TP



Comments:

- Figure 3 is a trend of the monthly average final effluent TP.
- The monthly average final effluent TP concentrations met the ECA limit and objective in 2023.
- The monthly average TP concentrations did achieve the voluntary target of 0.3 mg/L in 2023.

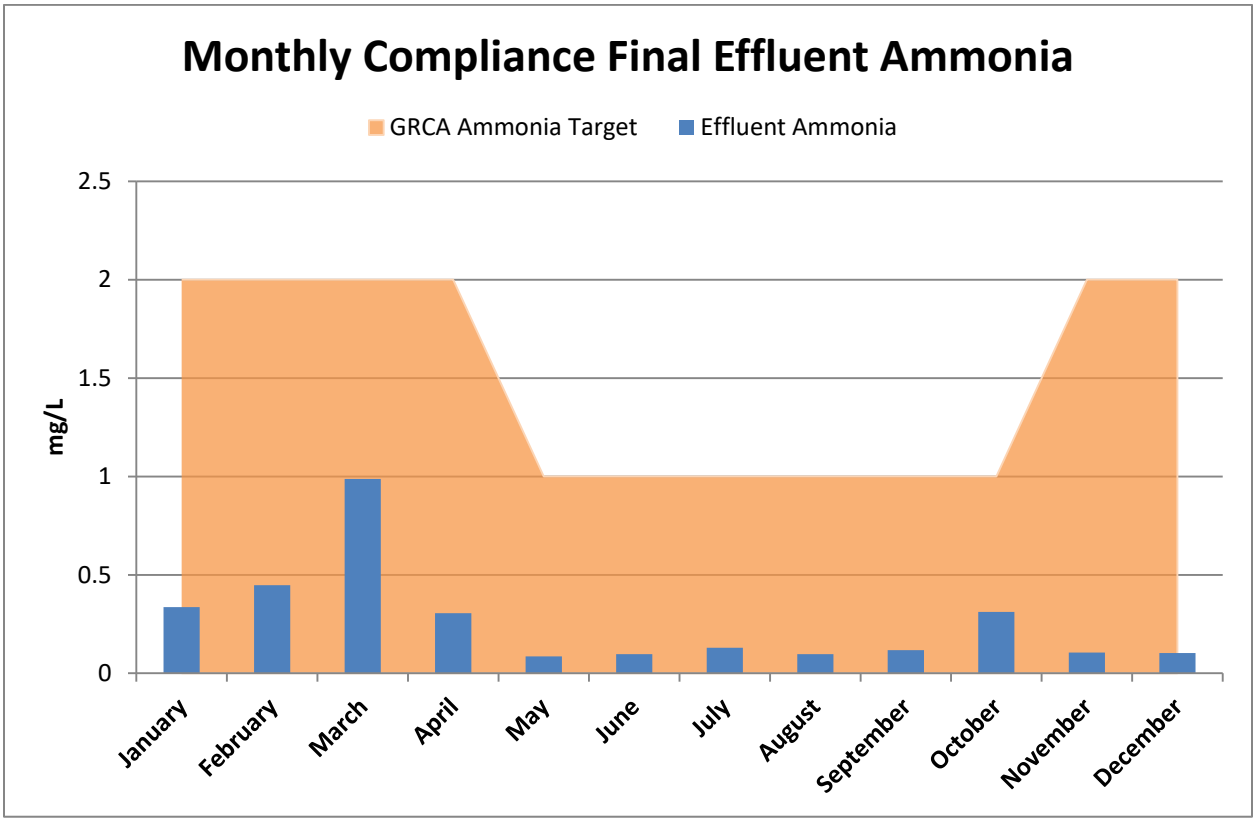
Figure 4 - Monthly Geometric Mean Density for Final Effluent E. Coli



Comments:

- Figure 4 is a trend of the monthly geometric mean density for final effluent E. Coli in CFU / 100 mL.
- The monthly geometric mean density for final effluent E. Coli met the ECA limit in 2023.

Figure 5 - Monthly Average Final Effluent Total Ammonia Nitrogen



Comments:

- Figure 5 is a trend of the monthly average final effluent total ammonia nitrogen (TAN).
- There is no limit or objective identified in the ECA for TAN.
- The monthly average final effluent TAN voluntary targets:
  - 1 mg/L - May to Oct.
  - 2 mg/L – Nov. to Apr.
- The final effluent TAN achieved the voluntary targets in all 12 months of 2023.

The City continues to strive to achieve the best possible performance from the WWTP by employing total mass control as a process control method and the use of other optimization tools. As a result, the plant achieved the voluntary target for TP and the voluntary target for TAN in all months of 2023.

4. Per Capita Flows and Loadings

The raw sewage per capita flows, loadings and ratios are calculated and compared to typical values to determine if the raw sewage received represents typical wastewater or if it is influenced by other sources in the collection system. Table 3 is a summary of the per capita flows, loadings and ratios for the Brantford WWTP.

Table 3 - Brantford WWTP Per Capita Flows and Loadings

Parameter	2022	2023	Typical
Population	104,688	104,688	--
WWTP Rated Capacity (m^3/d)	81,800	81,800	--
Average Daily Influent Flow (m^3/d)	36,185	41,924	--
Peak Daily influent Flow (m^3/d)	59,310	78,473	--
Annual Average Influent BOD_5 (mg/L)	208	188	--
Annual Average Influent TSS (mg/L)	252	237	--
Annual Average Influent TKN (mg/L)	37.7	37.9	--
Annual Average Influent TP (mg/L)	4.6	4.5	--
Per Capita Wastewater Flow (L/person/day)	346	400	294 – 351
Per Capita BOD_5 Loading (g/person/day)	71	73	63 – 77
Per Capita TSS Loading (g/person/day)	86	93	69 – 93
Per Capita TKN Loading (g/person/day)	13	15	13 – 14
Per Capita TP Loading (g/person/day)	1.6	1.8	1.6 – 2.0
Average Daily Flow as % of Rated Capacity	44.24%	51.25%	--
Max Flow Day / Annual Average Flow	1.64	1.87	2.25 – 3.06
Influent TSS/BOD_5	1.21	1.26	1.01 – 1.25
Influent TKN/BOD_5	0.18	0.20	0.17 – 0.23

All of the calculated per capita flows, loadings and ratios are close to typical values or within the typical ranges. The typical values are the median values for the Grand River Watershed-wide Wastewater Optimization Program (2012 to 2020). Therefore, it can be concluded that the data used for this analysis is representative of typical municipal wastewater in the Grand River watershed.

Additionally, since influent flows are now based on the new MAG meters, many of the values in Table 3 are higher in 2023 compared to the same values in 2022.

5. Operational Challenges

As per the ECA, this section's purpose is to provide a summary of significant operational problems encountered and any associated corrective actions that were implemented.

- PM #1 Secondary Clarifiers #1 to #4 – Secondary clarifiers #1 to #4 were originally built when the WWTP was commissioned in 1960. Due to their age and condition, they are almost unusable and left out of service at all times. The City is currently undergoing a condition assessment of all secondary clarifiers followed by specific rehabilitation work. Upon completion of the project, secondary clarifiers #1 to #4 will be able to be placed back in service.
- PM #2 Secondary Clarifier #8 – Secondary clarifier #8 has been out of service since 2019 due to its condition and cannot be placed back into service. This leaves PM #2 with no redundancy for its secondary clarifiers. The City is currently undergoing a condition assessment of all secondary clarifiers followed by specific rehabilitation work. Upon completion of this project, secondary clarifier #8 will be completely replaced which will provide redundancy again.
- PM #2 Primary Clarifier #6 Bridge Failure – PM #2 was without primary clarifier #6 due to electrical issues with the travelling bridge mechanism. The travelling bridge performs sludge and scum collection. Once repairs were made, the primary clarifier was returned to service.
- Digester P5 Out of Service – Digester P5 has been out of service since spring of 2022 for cleaning, condition assessment and repairs as part of an on-going capital program. It is expected that the rehabilitation work will commence in 2024.
- PM #1 Primary Clarifier #1, #2, and #4 Upgrades – As a result of the upgrades to primary clarifiers #1, #2 and #4, the tanks were individually taken out of service to complete the rehabilitation work which caused a reduction in treatment capacity. However, the ECA limits and objectives as well as the voluntary targets for TP and TAN were still met during this time.

6. Sludge Generation

6.1. Sludge Accountability

A sludge accountability analysis compares the amount of sludge reported to be removed from the plant (the sum of raw sludge pumped to the digesters and effluent TSS) to the amount of sludge projected to be produced by the plant (the sum of solids removed in the primary clarifiers, BOD_5 converted to solids in the aeration basins and the chemical added for phosphorus removal) to determine if monitoring data is truly representative and accurate. If the difference between the projected and reported masses is within +/- 15%, then the reported

data is likely accurate. Table 4 is a summary of the sludge accountability analysis for the Brantford WWTP.

Table 4 - Summary of Sludge Accountability

Parameter	Reported Sludge (kg/d)	Parameter	Projected Sludge (kg/d)	Accountability
Intentional Wasting	8,963.2	**Primary Sludge**	4,538.8	6.8%
Unintentional Wasting	302.3	**Biological Sludge**	4,115.0	
Total Reported Sludge	9,265.6	**Chemical Sludge**	1,290.0	
		Total Projected Sludge	9,943.8	

The sludge accountability analysis closed within +/-15%, which means that the data is accurate and representative.

6.2. Sludge Removal

Digested sludge (biosolids) produced at the Brantford WWTP is pumped to three on-site storage tanks prior to removal for liquid land application. Table 5 is a monthly summary of the biosolids removed for land application in 2023 compared to 2022.

Table 5 - Summary of Monthly Biosolids Removal

Month	2022 m^3	2023 m^3	% Change
January	0	0	
February	0	0	
March	0	0	
April	5,282.90	11,590.26	
May	9,358.40	4,641.50	
June	0	0.00	
July	6,861.30	572.70	
August	1,583.60	4,305.40	
September	6,761.30	6,564.90	
October	11,045.00	0.00	
November	10,999.30	17,110.60	
December	0	0	
Total	51,891.80	44,785.36	-13.7%

The total volume of sludge removed in 2023 was 44,785.36 m^3 which represented a decrease of 13.7% over 2022. This can be attributed to effective decanting of the storage tanks because of the installation of new plug valves in January 2023.

6.3. Biosolids Analytical Data

The analytical data for the anaerobic biosolids is summarized in Table 6 (total solids, nutrients and pathogens) and in Table 7 (metals).

Table 6 - Summary of Total Solids, Nutrients and Pathogens for Anaerobic Biosolids

Month	TS (%)	TKN (mg/kg)	NH_3-N (mg/kg)	NO_3-N (mg/kg)	TP (mg/kg)	K (mg/kg)	E. Coli (CFU/g)
January	2.76	78,874	33,893	1.70	28,845	3,732	41,860
February	2.85	79,582	34,649	1.65	26,196	3,062	11,175
March	2.73	81,051	36,968	1.48	30,838	3,620	38,950
April	2.93	77,764	34,683	1.40	32,988	3,679	31,525
May	2.74	81,324	34,166	1.47	35,969	3,810	17,980
June	2.28	90,308	36,288	1.77	36,625	3,608	33,300
July	2.73	73,853	27,905	1.48	33,812	2,926	59,600
August	2.96	67,729	22,336	1.36	33,833	2,487	66,700
September	2.88	65,151	21,304	1.39	31,746	2,274	44,725
October	2.56	55,556	25,472	1.42	30,661	2,515	27,780
November	2.60	72,613	25,847	1.55	31,138	2,768	69,850
December	2.75	72,630	21,655	1.46	30,954	2,950	40,750
Average	2.73	74,703	29,597	1.51	31,967	3,119	40,350

Table 7 - Summary of Regulated Metals for Anaerobic Biosolids

Month	As (mg/kg)	Cd (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Hg (mg/kg)	Mo (mg/kg)	Ni (mg/kg)	Pb (mg/kg)	Se (mg/kg)	Zn (mg/kg)
CM1	1.7	0.34	3.4	28	17.0	0.11	0.94	4.2	11	0.34	42
CM2	170	34	340	2,800	1,700.0	11	94	420	1,100	34	4,200
Jan.	7.3	0.44	5.7	87.1	745.0	3.67	17.45	21.1	30.6	7.34	766.2
Feb.	10.3	0.43	4.8	69.3	578.1	3.52	12.25	16.4	23.5	7.04	604.0
Mar.	6.0	0.36	4.8	81.3	675.3	3.74	12.27	18.8	23.0	7.49	652.9
Apr.	7.0	0.35	5.3	87.0	1,326.7	3.49	16.03	20.7	33.7	6.98	727.2
May	7.4	0.35	4.9	80.9	708.7	1.63	15.52	18.5	29.2	4.71	738.1
Jun.	8.9	0.29	5.0	90.1	820.5	1.55	20.75	15.5	35.0	5.12	906.6
Jul.	7.4	0.23	4.8	86.8	799.0	0.72	20.92	19.0	36.6	3.35	874.5
Aug.	6.8	0.25	4.7	94.3	1,338.0	1.08	21.90	21.1	40.3	4.00	949.0
Sep.	7.0	0.21	4.6	90.1	797.4	0.80	19.16	20.0	71.3	4.01	891.9
Oct.	7.9	0.27	4.2	93.1	787.0	1.51	18.93	23.1	179.0	4.91	866.3
Nov.	7.7	0.25	4.3	93.8	762.3	0.77	19.32	21.1	168.8	3.00	786.4
Dec.	7.3	0.18	4.1	93.3	713.8	1.17	16.77	21.7	128.1	3.83	766.3
Avg.	7.6	0.3	4.8	87.3	837.7	2.0	17.6	19.8	66.6	5.1	794.1

Metal Concentrations for the anaerobic sludge were converted from mg/L to mg/kg (as per the regulations) to compare with the limits in the Nutrient Management Act, O. Reg. 267/03 Section 98 Table 1 “Standards for Regulated Metals in Materials Applied to Land that are Sewage Biosolids.” The metals met the CM2 limit in all months in 2023.

6.4. Biosolids Land Application Sites

The following table summarizes the application sites that the City’s contracted biosolids hauler (Enviroland Services Inc.) utilized for biosolids haulage in 2023 for the Brantford WWTP. All biosolids is hauled to certified agricultural land by Enviroland (registered as a biosolids handling company through the Ministry of the Environment, Conservation and Parks #7937-AMQNUB). Table 8 is a summary of the conditioning sites used for biosolids from the Brantford WWTP.

Table 8 - Summary of Conditioning Sites Used for Brantford WWTP Biosolids

Site #	Volume Applied (m^3)	Site #	Volume Applied (m^3)
22861	0.0	24790	5,624.8
24206	2,252.3	24931	11,590.3
24559	0.0	24932	0.0
24641	0.0	25047	2,625.8
24665	0.0	60002	8,346.3
24691	0.0	60012	11,149.0
24717	0.0	60498	1,653.0
24721	0.0	60904	1,543.9
Brantford Landfill	0.00	25120	0.0
		Total	**44,785.36**

7. Septage Receiving

The following section provides a summary of the daily volumes and analytical data for the septage received at the Brantford WWTP.

7.1. Septage Volumes

Volume of septage received at the facility in 2023 totaled 8,690 m^3 which is similar to the volume received in 2022 (8,589 m^3). The volumes received are summarized per quarter in Table 9.

7.2. Analytical Data

Table 9 is a summary of the average volumes received and the analytical data for the quarterly septage sampling conducted at the facility.

Table 9 - Summary of Quarterly Septage Volumes Received and Sampling Analysis

Quarter	Average Daily Volume Received (m^3/d)	Total Volume Received (m^3)	% of WWTP Flows	BOD_5 (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)
Q1 (January – March)	16.43	1,462	0.04%	4,080	2,500	133.00	2,470
Q2 (April – June)	28.14	2,533	0.06%	4,900	5,510	145.00	1,950
Q3 (July – September)	26.73	2,433	0.06%	6,810	5,820	177.00	5,820
Q4 (October – December)	24.86	2,263	0.07%	2,830	20,800	134.00	2,830
Annual	24.04	8,690	0.06%	4,655	8,658	147.25	3,267.50

8. Maintenance

The following section provides an overview of some of the major maintenance activities and capital upgrades carried out at the facility in 2023.

8.1. Summary of Major Maintenance Activities

- Replacement of the effluent flow meters for both process modules 1 and 2;
- Completed electrical repairs to primary clarifier no.6;
- Replaced multiple chemical storage tanks; and
- Installed new biosolids supernatant isolation valves.

8.2. Summary of Completed Capital Upgrades

- Upgrades to primary clarifiers 1, 2 and 4; and
- The condition assessment of all the secondary clarifiers.

8.3. Summary of Capital Projects in Progress:

- Rehabilitation of primary digester P5 and clean out of secondary digester S3, which is planned to be completed in Q4 of 2024;
- Design of the secondary clarifier upgrades will be completed in 2024;

- Construction of Empey St. WWPS upgrades began in November 2023 and is anticipated to be completed by Q4 2025;
- Environmental assessment of the Effluent Pumping Station at the WWTP;
- Design of a new UV disinfection system is estimated to be completed by Q2 of 2024.

9. Calibrations

This section provides a summary of calibrations performed on all effluent monitoring equipment. All calibration reports are included in this report as Appendix A.

9.1. Influent and Effluent Flow Meters

Calibration tests were performed on September 12th, 2023 for the final effluent meters (PM #1 and PM #2). Both meters are operating to within +/- 15% error. New influent flow meters are now operational.

10. Complaints

As per the ECA this section is to provide a summary of any complaints received and any steps taken to address the complaint. There were no complaints reported to the City regarding the WWTP in 2023.

11. Bypass, Spills, and Abnormal Discharge Events

As per the ECA this section is to provide a summary of all by-pass, spill or abnormal discharge events.

The WWTP experienced the release of digester gas through the waste gas flare, which had failed on February 15, 2023. The waste flare was restored on February 16, 2023 and approximately 2,300 m3 of digester gas was released.

12. Bypasses Due to Grand River High Water Levels

As per the ECA this section is to provide a summary of all bypasses due to high water level events in the Grand River and an update on the implementation plan for provision of effluent pumping to eliminate such bypasses. There were no bypass events due to high water levels in the Grand River from the WWTP.

The City is in the preliminary stages of the Environmental Assessment in and design of an effluent pumping station.

13. Notice of Modifications to Sewage Works

The following is an update to the one (1) outstanding modification initiated under the ECA's Limited Operational Flexibility in 2020, including the following:

- Upgrades to the PM #1 primary clarifiers (sludge and scum collectors, pumping and piping modifications, etc.). Construction completed in Q4 2022.

14. Other Information

No additional information was requested by the District Manager.

Appendix A – Flow Meter Calibration Records

Figure 6 - PM #1 Effluent Flow Meter Calibration Certificate

FRANKLIN EMPIRE

CALIBRATION REPORT

TAG NO.:	FIT- PM1
REPORT NO.:	Brant 23
DATE:	12-Sep-23

SITE:	Brantford WWTP	DATE:	12-Sep-23
PROCESS AREA:	Effluent Flow		
INSTR. TAG:	FIT- PM1	TECHNICIAN:	Mike Humphries
MANUFACTURER:	Siemens		
MODEL:	SITRANS LUT 440/XRS5C	REPORT NO.:	Brant 23
SERIAL No.:	PBD/L0160038/PBD/L0096510		
INSTR. RANGE:	0 - 1209 m3/d		

PRIMARY DEVICE:	36" Parshall Flume	
MAX FLOW:	1209	m^3/day
MAX HEAD:	75.28	cm
CONSTANT:	1886	
EXPONENT:	1.566	

Output:	mA	Flow
Zero:	4	0.00
Max:	20	1209.0

OCM Flow Table

Head Applied (cm)	Head Displayed (cm)	Error (%)	Calculated Flow (m^3/day)	Flow Displayed (m^3/day)	Error (%)	Calculated mA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
25.00	24.92	-0.32	215	214	-0.53	6.85	6.84	-0.10
50.00	50.04	0.08	637	638	0.16	12.43	12.45	0.16
65.00	65.03	0.05	961	961	0.04	16.71	16.73	0.10

Totalizer As Found		m^3
Totalizer As Left		m^3
Zero As Found	100.4	cm
Zero As Left	100.4	cm
Change in Zero	0.0	cm

Comments

New Install

AS FOUND: PASS AS LEFT: PASS CERTIFIED BY: Mike Humphries

Figure 7 - PM #2 Effluent Flow Meter Calibration Certificate

FRANKLIN EMPIRE

CALIBRATION REPORT

TAG NO.:	FIT- PM2
REPORT NO.:	Brant 23
DATE:	12-Sep-23

SITE:	Brantford WWTP	DATE:	12-Sep-23
PROCESS AREA:	Effluent Flow		
INSTR. TAG:	FIT- PM2	TECHNICIAN:	Mike Humphries
MANUFACTURER:	Siemens		
MODEL:	SITRANS LUT 440/XRS5C	REPORT NO.:	Brant 23
SERIAL No.:	PBD/L0160026/PBD/L00965		
INSTR. RANGE:	0 - 1209 m3/d		

PRIMARY DEVICE:	36" Parshall Flume	
MAX FLOW:	1209	m^3/day
MAX HEAD:	75.28	cm
CONSTANT:	1886	
EXPONENT:	1.566	

Output:	mA	Flow
Zero:	4	0.00
Max:	20	1209.0

OCM Flow Table

Head Applied (cm)	Head Displayed (cm)	Error (%)	Calculated Flow (m^3/day)	Flow Displayed (m^3/day)	Error (%)	Calculated mA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
25.00	24.97	-0.12	215	215	-0.06	6.85	6.84	-0.10
50.00	49.91	-0.18	637	635	-0.31	12.43	12.40	-0.24
65.00	64.87	-0.20	961	958	-0.28	16.71	16.66	-0.32

Totalizer As Found		m^3
Totalizer As Left		m^3
Zero As Found	103.6	cm
Zero As Left	103.6	cm
Change in Zero	0.0	cm

Comments

New Install

AS FOUND: PASS AS LEFT: PASS CERTIFIED BY: Mike Humphries