Corporation de la ville de of the Town of HAWKESBURY

600, rue Higginson Street, Hawkesbury, ON K6A 1H1

2019

WASTEWATER TREATMENT PLANT ANNUAL PERFORMANCE REPORT

Prepared by the Environmental Service
January 1, 2019 to December 31, 2019 reporting period

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Introduction

The Corporation of the Town of Hawkesbury owns and operates the Wastewater Treatment Plant (WWTP) located at 815, Main East street. The WWTP has a rated capacity of 13,800 m^3/d and is designated a Class IV Wastewater Treatment Facility.

The wastewater collection system consists of over 45 km of sanitary sewers, 6 km of combined sewers, a raw sewage pumping station and a wastewater treatment plant that treats approximately 3,917 sanitary services.

Wastewater is conveyed through gravity to the RSPS located near the WWTP. Under normal dry weather conditions, sewage that enters the RSPS is pumped to the WWTP for treatment and discharge to the Ottawa River. However, during significant wet weather events, the RSPS influent channel overflow into a tank where a large capacity pumps it into two equalization tanks to be treated by the WWTP.

The WWTP consists of two vortex grit removal screens of 6 mm in diameter, three primary clarifiers, three aeration tanks, four secondary clarifiers and an ultra-violet disinfection before discharge into the Ottawa River. Sludge handling consists of two aerobic digester and one sludge stabilizer. Digested sludge is thickened by two centrifuges and bio-solid is disposed of on approved farmlands.

The following 2019 Annual Performance Report has been prepared and submitted to meet the requirements of the Ministry of the Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval (ECA) #4692-8DVQTW for the design and operation of the Corporation of the Town of Hawkesbury Waterwater Treatment Plant (WWTP).

Interpretation of Monitoring and Analytical Data

In 2019, no effluent sample results exceeded the Monthly Average Effluent Limits outlined in Condition 7(1) to 7(4) of the amended ECA. Please refer to *Appendix A* for a detailed summary of monthly concentrations and waste loadings. *Table 1* (below) compares the Average Monthly Effluent Concentration range and Loading range with ECA criteria Effluent Compliance Limits, whereas *Table 2* summarizes the individual Notification of Non-Compliance with the ECA issued during the year.

Pursuant to condition 9(5) of the ECA, un-ionized ammonia was calculated on weekly total ammonia nitrogen, temperature and pH sample results and ranged from 0.0010 mg/L to 0.0373 mg/L with an annual average of 0.0104 mg/L during 2019. Please refer to *Appendix C* for the detailed monthly results. We also tested for acute lethality for Rainbow trout and Daphnia magna with Pollutech Enviroquatics Limited. The certificate of analysis from the lab showed 0% mortality, meaning no lethality for Rainbow trout and Daphnia magna.

TABLE 1

Average Monthly Effluent Concentration Range and Waste Loading Range compare with the amended ECA criteria

Effluent Parameter	Average Monthly Effluent Concentration Range in mg/L	ECA Monthly Effluent Concentration Limit in mg/L	Average Monthly Effluent Waste Loading Range in kg/day	ECA Monthly Effluent waste Loading Limit in kg/day
CBOD-5	3.0 – 3.8	**25.0**	14.5 – 61.5	**345**
Total Suspended Solid	3.3 – 12.6	**25.0**	16.3 – 204	**345**
Total Phosphorous	0.04 – 0.27	**0.89**	0.20 – 3.10	**12.3**
E.coli (ct/100ml)	2.0 – 67.5	**200 ct/100ml**	**n/a**	**n/a**
Total Ammonia	0.16 – 0.45	**12.0 (June 1 to Sept 30)**	0.90 – 2.41	**166 (June 1 to Sept 30)**
Total Ammonia	0.15 – 3.74	**20.0 (Oct. 1 to May 31)**	1.16 – 32.37	**276 (Oct. 1 to May 31)**
pH	7.3 to 7.8	**6.0 to 9.5**	**n/a**	**n/a**

n/a - not an ECA requirement

TABLE 2

Notification of Effluent Quality Non-Compliance

Month	Parameter & Limit	Result
January	No effluent quality non-compliance	n/a
February	No effluent quality non-compliance	n/a
March	No effluent quality non-compliance	n/a
April	No effluent quality non-compliance	n/a
May	No effluent quality non-compliance	n/a
June	No effluent quality non-compliance	n/a
July	No effluent quality non-compliance	n/a
August	No effluent quality non-compliance	n/a
September	No effluent quality non-compliance	n/a
October	No effluent quality non-compliance	n/a
November	No effluent quality non-compliance	n/a
December	No effluent quality non-compliance	n/a

Operating Problems Encountered and Correction Actions Taken

There were no breakdown or operating problems.

Maintenance Summary

Regular preventive maintenance of existing and new equipment were perform throughout the year.

Effluent Quality Assurance and Control Measures Undertaken

All sampling were performed by competent Certified Operators in accordance with the Terms and Conditions of the Amended Environmental Compliance Approval (ECA). Samples were submitted to an accredited laboratory (Caduceon Laboratories) for analysis. Additionally, analysis were performed on the dewatered cake (biosolids) for land application and toxicity analysis (Acute Lethality) was performed on final effluent.

Calibration and Inspection

The following calibrations were performed:

-Flowmeters and level sensors by Capital Controls and Instrumentation Inc.
-Gas sensors from every building by CDTEC Calibrations Inc. (two times, every six month)

The following inspections were performed:

-Backflow preventers by Backflow Preventer and Plumbing
-Lifting devices by Corbett & Corbett Inc.
-Extinguishers by Champlain Fire Protection
-Fire alarm system by Chubb Edwards

Effluent Objectives

Table 3 (below) illustrates the 2019 annual average effluent quality ranges compared to the effluent objectives outlined in Conditions 6(1) and 6(2) (a), (b) and (c) of the amended ECA. There were no effluent objective results exceedance for 2019.

TABLE 3
Comparison of Annual Average Effluent Vs Monthly ECA Average Effluent Objectives

Effluent Objectives Parameter	Annual Average Effluent Conc. (mg/L)	Monthly ECA Avg. Effluent Objectives
CBOD-5	3.2	15.0
Total Suspended Solids	5.9	15.0
Total Phosphorus	0.11	0.5
Total Ammonia (June 1 to Sept 30)	0.33	8.0
Total Ammonia (Oct 1 to May 31)	1.86	12.0
pH	7.6	6.5 to 8.5
E. Coli (ct/100ml)	12.3	100 ct/100ml
Rated Capacity	7,235m^3/day	13,800 m^3/day

Biosolids Generation

During 2019, the Hawkesbury WWTP hauled 220.10 dry Tons of Organic Waste (biosolids) to the transfer site (Ferme A.G.L. Malette, ECA # 8311-8UZJ8K). The *Table 4* (below) summarizes the amounts and locations of the soil conditioning activities in 2019. We anticipate the volume of sludge to be 228 dry tons for 2020.

TABLE 4
Location of Spreading the Organic Waste

Hawkesbury Organic Soil Conditioning Summary			
Organic Soil Conditioning Location	**NASM plan**	**Field #**	**Dry Ton (kg)**
Ferme A.G.L. Malette	23299	n/a	220.10
HAWKESBURY WWTP TOTAL ORGANIC WASTE GENERATED			220.10

Summary of Complaints

There were no complaints reported in 2019.

By-passing / Spills / Abnormal Discharges

There were 17 Combined Sewer Overflow (CSO) in 2019. Please refer to *Appendix F*, 2019 Bypass Event Report and *Appendix G*, 2019 Annual Bypass Report. All CSO bypasses were reported to the Spill Action Center and the Ministry of the Environment, Conservation and Parks (MECP) and we communicated the laboratory results of the bypasses to our MECP Environmental Officer by email. These bypasses represent 0.318% of the total annual treated wastewater. There were no spills or abnormal discharge events to report during this year.

Additional Information Requested

On-going communication with the MECP has occurred throughout the reporting year, addressing the MUMP's data to Ottawa and Etobicoke area offices. There were no additional information requested during this reporting period. We trust this satisfies the Ministry of the Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval (ECA) #4692-8DVQTW for the design and operation of the Corporation of the Town of Hawkesbury Wastewater Treatment Plant (WWTP).

Availability of Report

This report is available at the following locations:

1. ***Environmental Service Department***
   Corporation of the Town of Hawkesbury
   815 Main East
   Hawkesbury (Ontario) K6A 1B5
   (613) 632-4770

2. ***Hawkesbury Public Library***
   550 Higginson Street
   Hawkesbury, Ontario
   K6A 1H1

3. ***Town's website*** www.hawkesbury.ca

If the format of this document is inadequate, please contact the Clerk's office at 613-632-0106 extension 2226 and the municipality will provide, to the best of its abilities, the required assistance.

This 2019 Annual Report has been prepared on March 5, 2020 and has been endorsed by the Corporation of the Town of Hawkesbury Municipal Council on March 30, 2020.

Nancy Beks

Prepared by
Nancy Beks
DWQMS rep.
Corporation of the Town of Hawkesbury

Martin Perron

Approved by
Martin Perron
Environmental Service Superintendent
Corporation of the Town of Hawkesbury

Appendix A
2019 Monthly Performance Assessment Report

Raw Flow Summary (m^3)	January	February	March	April	May	June	July	August	September	October	November	December
Raw Total Monthly Flow	149,332	140,177	268,297	485,672	280,348	220,553	174,039	158,776	161,444	246,426	238,518	164,672
Raw Avg. Daily Flow	4,817	5,006	8,655	16,189	9,043	7,352	5,614	5,122	5,381	7,949	7,951	5,312
Raw Max. Daily Flow	5,888	6,601	20,118	34,779	18,977	13,119	12,184	9,225	7,886	18,250	28,211	7,958
Raw Min. Daily Flow	4,347	4,405	4,826	8,884	6,406	5,101	4,547	4,174	4,308	4,708	5,116	3,971

Total Annual Raw Flow (m^3) = 2,688,254

Average Annual Daily Flow (m^3) = 7,366

Effluent Flow Summary (m^3)	January	February	March	April	May	June	July	August	September	October	November	December
Effluent Total Monthly Flow	144,691	136,656	263,673	481,731	277,145	216,807	169,758	155,164	157,248	242,426	234,386	160,601
Effluent Avg. Daily Flow	4,667	4,881	8,506	16,058	8,940	7,227	5,476	5,005	5,242	7,820	7,813	5,181
Effluent Max. Daily Flow	5,760	6,491	19,959	34,708	18,862	12,996	12,019	9,037	7,755	18,105	28,032	7,837
Effluent Min. Daily Flow	4,206	4,273	4,719	8,829	6,299	4,975	4,416	4,089	4,175	4,575	4,972	3,851

Total Annual Raw Flow (m^3) = 2,640,286

Average Annual Daily Flow (m^3) = 7,235

Biochemical Oxygen Demand	January	February	March	April	May	June	July	August	September	October	November	December
Raw Avg. CBOD (mg/L)	78.2	86.8	62.5	28.0	52.5	54.5	88.6	128.8	112.0	88.8	114.3	65.2
Effluent Avg. CBOD (mg/L)	3.0	3.3	3.0	3.8	3.5	3.0	3.0	3.3	3.0	3.0	3.0	3.0
CBOD Loading (kg/d)	14.5	16.3	26.0	61.5	31.7	22.1	16.8	16.9	16.1	23.8	23.9	15.9
Percent Removal	96.2	96.3	95.2	86.4	93.3	94.5	96.6	97.4	97.3	96.6	97.4	95.4

Suspended Solids	January	February	March	April	May	June	July	August	September	October	November	December
Raw Avg. SS (mg/L)	212.0	255.0	126.3	84.0	98.8	158.8	206.0	377.5	325.0	187.0	177.5	198.0
Effluent Avg. SS (mg/L)	3.8	3.3	6.8	12.6	9.5	7.8	4.6	5.3	3.8	4.2	5.3	4.2
SS Loading (kg/d)	18.3	16.3	58.4	204.0	85.9	57.3	25.8	27.1	20.4	33.4	41.7	22.3
Percent Removal	98.2	98.7	94.7	85.0	90.4	95.1	97.8	98.6	98.8	97.8	97.0	97.9

Phosphorous	January	February	March	April	May	June	July	August	September	October	November	December
Raw Avg. PHOS (mg/L)	3.30	3.29	1.02	0.81	3.91	2.43	2.38	4.97	4.11	3.38	2.53	2.25
Effluent Avg. PHOS (mg/L)	0.08	0.13	0.13	0.19	0.27	0.12	0.04	0.10	0.07	0.07	0.08	0.07
PHOS Loading (kg/d)	0.40	0.63	1.08	3.08	2.44	0.88	0.22	0.51	0.38	0.52	0.64	0.37
Percent Removal	97.52	96.20	87.75	76.54	93.09	95.06	98.32	97.99	98.30	98.05	96.83	96.89

Nitrogen Series	January	February	March	April	May	June	July	August	September	October	November	December
Raw Avg. NH3 as N (mg/L)	14.98	14.15	11.15	4.70	9.00	10.4	12.8	17.4	17.80	19.28	13.7	18.06
Effluent Avg. NH3 as N (mg/L)	2.17	2.46	3.74	1.30	1.70	0.30	0.16	0.40	0.45	0.15	0.40	2.93
NH3 Loading (kg/d)	10.44	12.32	32.37	21.05	15.37	2.21	0.90	2.05	2.41	1.16	3.18	15.54
Percent Removal	85.53	82.61	66.46	72.34	81.11	97.12	98.75	97.70	97.49	99.24	97.08	83.80

Disinfection	January	February	March	April	May	June	July	August	September	October	November	December
Effluent Geo. Mean E. Coli / 100mL	4.3	2.0	3.7	7.2	11.3	22.6	5.8	4.4	67.5	5.8	3.9	9.3

pH	January	February	March	April	May	June	July	August	September	October	November	December
Effluent Avg. pH	7.4	7.4	7.3	7.7	7.7	7.6	7.6	7.3	7.5	7.7	7.8	7.6

Temperature	January	February	March	April	May	June	July	August	September	October	November	December
Effluent Avg. Temp.	7.9	8.1	8.0	7.2	11.5	16.1	21.2	22.7	21.0	17.3	13.1	9.6

Appendix B
2019 Monthly Raw Sewage Data Report

Flow Summary (m^3)	January	February	March	April	May	June	July	August	September	October	November	December
Raw Total Monthly Flow	149,332	140,177	268,297	485,672	280,348	220,553	174,039	158,776	161,444	246,426	238,518	164,672
Raw Avg. Daily Flow	4,817	5,006	8,655	16,189	9,043	7,352	5,614	5,122	5,381	7,949	7,951	5,312
Raw Max. Daily Flow	5,888	6,601	20,118	34,779	18,977	13,119	12,184	9,225	7,886	18,250	28,211	7,958
Raw Min. Daily Flow	4,347	4,405	4,826	8,884	6,406	5,101	4,547	4,174	4,308	4,708	5,116	3,971

TKN (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	25.32	23.53	11.88	6.24	18.48	20.13	19.72	29.00	28.83	29.94	20.53	25.26
Maximum	34.00	31.90	16.50	10.70	27.50	29.60	22.70	37.50	49.80	39.20	34.30	42.40
Minimum	19.50	17.90	2.20	1.80	13.00	14.10	14.20	24.10	17.80	18.30	12.10	16.30

Total Phosphorous (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	3.30	3.29	1.02	0.81	3.91	2.43	2.38	4.97	4.11	3.38	2.53	2.25
Maximum	3.75	4.54	2.05	1.41	5.17	3.21	3.05	6.64	8.79	4.51	4.36	3.58
Minimum	2.86	2.36	0.19	0.21	2.40	1.51	1.27	3.17	1.70	1.32	1.12	1.65

pH	January	February	March	April	May	June	July	August	September	October	November	December
Average	7.5	7.3	7.3	7.7	7.6	7.6	7.4	7.2	7.3	7.5	7.4	7.5
Maximum	7.9	7.6	7.4	7.8	7.8	7.7	7.8	7.5	7.3	7.7	7.7	7.7
Minimum	7.1	7.1	7.1	7.5	7.4	7.4	7.2	7.0	7.2	7.3	7.3	7.4

Suspended Solids (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	212.0	255.0	126.3	84.0	98.8	158.8	206.0	377.5	325.0	187.0	177.5	198.0
Maximum	300.0	420.0	185.0	130.0	120.0	240.0	280.0	530.0	640.0	310.0	260.0	280.0
Minimum	160.0	140.0	95.0	40.0	70.0	75.0	90.0	260.0	120.0	65.0	95.0	140.0

CBOD - 5 (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	78.2	86.8	62.5	28.0	52.5	54.5	88.6	128.8	112.0	88.8	114.3	65.2
Maximum	118.0	158.0	112.0	49.0	86.0	64.0	204.0	196.0	167.0	136.0	140.0	78.0
Minimum	47.0	50.0	31.0	12.0	36.0	42.0	15.0	93.0	92.0	54.0	88.0	39.0

Appendix C
2019 Monthly Effluent Data Report

Flow Summay (m^3)	January	February	March	April	May	June	July	August	September	October	November	December
Effluent Total Monthly Flow	144,691	136,656	263,673	481,731	277,145	216,807	169,758	155,164	157,248	242,426	234,386	160,601
Effluent Avg. Daily Flow	4,667	4,881	8,506	16,058	8,940	7,227	5,476	5,005	5,242	7,820	7,813	5,181
Effluent Max. Daily Flow	5,760	6,491	19,959	34,708	18,862	12,996	12,019	9,037	7,755	18,105	28,032	7,837
Effluent Min. Daily Flow	4,206	4,273	4,719	8,829	6,299	4,975	4,416	4,089	4,175	4,575	4,972	3,851

TKN (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	3.68	4.18	5.25	3.06	3.40	1.48	1.18	1.50	1.50	1.18	1.53	4.54
Maximum	5.40	6.10	6.90	4.60	5.20	2.10	1.40	2.30	2.30	1.60	2.10	5.70
Minimum	1.90	3.10	3.60	1.90	2.10	1.10	1.00	1.20	1.00	0.80	0.90	2.90

NH3 as N (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	2.17	2.46	3.74	1.30	1.70	0.30	0.16	0.40	0.45	0.15	0.40	2.93
Maximum	3.93	3.84	5.30	2.28	3.28	0.74	0.26	1.24	1.17	0.31	0.82	4.07
Minimum	0.75	1.72	2.46	0.84	0.73	0.12	0.10	0.09	0.15	0.05	0.06	1.76

Un-Ionized Ammonia (NH3) mg/L	January	February	March	April	May	June	July	August	September	October	November	December
Average	0.0115	0.0115	0.0148	0.0125	0.0216	0.0049	0.0032	0.0040	0.0079	0.0032	0.0069	0.0229
Maximum	0.0330	0.0202	0.0188	0.0285	0.0373	0.0102	0.0040	0.0117	0.0202	0.0081	0.0113	0.0328
Minimum	0.0032	0.0067	0.0107	0.0053	0.0089	0.0017	0.0024	0.0012	0.0027	0.0010	0.0015	0.0167

Total Phosphorous (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	0.08	0.13	0.13	0.19	0.27	0.12	0.04	0.10	0.07	0.07	0.08	0.07
Maximum	0.10	0.26	0.15	0.44	0.44	0.19	0.05	0.16	0.10	0.15	0.09	0.09
Minimum	0.05	0.08	0.08	0.05	0.11	0.07	0.04	0.07	0.02	0.04	0.07	0.05

Suspended Solids (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	3.8	3.3	6.8	12.6	9.5	7.8	4.6	5.3	3.8	4.2	5.3	4.2
Maximum	7.0	4.0	10.0	28.0	22.0	12.0	8.0	9.0	5.0	9.0	7.0	6.0
Minimum	3.0	3.0	3.0	4.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0

CBOD - 5 (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average	3.0	3.3	3.0	3.8	3.5	3.0	3.0	3.3	3.0	3.0	3.0	3.0
Maximum	3.0	4.0	3.0	6.0	5.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0
Minimum	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

pH	January	February	March	April	May	June	July	August	September	October	November	December
Average	7.4	7.4	7.3	7.7	7.7	7.6	7.6	7.3	7.5	7.7	7.8	7.6
Maximum	7.7	7.4	7.5	7.9	7.8	7.7	7.9	7.5	7.6	7.8	7.9	7.7
Minimum	7.1	7.2	7.3	7.4	7.6	7.6	7.4	7.2	7.5	7.5	7.7	7.4

Temperature	January	February	March	April	May	June	July	August	September	October	November	December
Average	7.9	8.1	8.0	7.2	11.5	16.1	21.2	22.7	21.0	17.3	13.1	9.6
Maximum	8.5	14.3	8.1	8.7	13.8	19.2	23.4	23.6	22.1	19.3	15.3	11.0
Minimum	6.5	5.0	8.0	5.6	8.5	13.0	19.6	21.9	19.5	13.9	11.0	7.9

Appendix D
2019 Monthly Chemical Data Report

Disinfection \ Effluent E. Coli (cfu / 100 mL)	January	February	March	April	May	June	July	August	September	October	November	December
Average	4.3	2.0	3.7	7.2	11.3	22.6	5.8	4.4	67.5	5.8	3.9	9.3
Maximum	24.0	2.0	12.0	34.0	46.0	44.0	400.0	12.0	208.0	400.0	10.0	148.0
Minimum	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	24.0	2.0	2.0	2.0

Phosphorous Removal \ Chem. Add Coagulant (kg)	January	February	March	April	May	June	July	August	September	October	November	December
Average	181	186	322	611	340	277	208	188	198	299	280	160
Total	5,605	5,201	9,977	18,319	10,531	8,298	6,449	5,830	5,933	9,255	8,399	4,955

Coagulant Dosage (mg/L)	January	February	March	April	May	June	July	August	September	October	November	December
Average (dry)	20.0	19.0	19.2	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	16.0
Maximum (dry)	21.0	22.0	20.4	20.0	20.0	20.0	21.0	20.0	20.0	20.0	20.0	16.0
Minimum (dry)	19.0	16.0	17.7	19.0	19.0	19.0	18.0	18.0	17.0	19.0	15.0	15.0

Polymer	January	February	March	April	May	June	July	August	September	October	November	December
Total (kg)	767.5	544.9	646.4	760.1	527.7	592.8	796.9	823.2	615.4	652.7	667.1	466.5

Appendix E
2019 Monthly Cake Analysis

Month	Cake Hauled (Dry Ton)	pH	Total Solids (%)	NH_3 (µg/g)	TKN (µg/g)	NO_2 (µg/g)	NO_3 (µg/g)	P (µg/g)	K (µg/g)	Al (µg/g)	As (µg/g)	Ca (µg/g)	Cd (µg/g)	Cr (µg/g)	Co (µg/g)	Cu (µg/g)	Pb (µg/g)	Hg (µg/g)	Mo (µg/g)	Ni (µg/g)	Se (µg/g)	Zn (µg/g)
January	19.74	6.57	25.4	639	51800	1	47	27200	1340	53300	4	20400	0.6	39	4	935	15	0.230	4	20	2	1190
February	14.14	6.62	33.5	773	49900	1	12	27400	1410	57900	4		0.7	42	4	904	16	0.220	4	21	2	1220
March	16.48	6.20	25.2	5	38800	1	218	33900	1340	70200	4	22700	0.6	44	4	861	16	0.22	3	20	2	1310
April	18.44	6.08	34.2	286	38200	5	1150	33400	1280	64400	4	28900	0.7	49	4	515	188	0.250	3	22	2	1280
May	16.64	6.57	27.6	16	31800	10	721	29900	1230	71300	4	27500	0.6	53	6	520	21	0.190	3	26	2	1180
June	19.70	5.91	28.4	5	22200	10	2050	16400	2510	58400	4	29200	0.8	52	6	1010	21	0.230	1	25	2	1000
July	22.86	5.92	25.6	373	39100	1	433	29900	1070	56000	4	26600	0.8	51	5	1280	21	0.200	3	24	2	1030
August	23.43	6.86	22.9	43	24600	42	1230	38100	2130	56500	3	29300	0.7	43	4	825	19	0.310	2	20	2	948
September	17.70	7.27	25.7	142	46800	2	749	23800	1950	51300	4	20500	0.6	46	4	958	19	0.230	4	22	2	968
October	18.07	7.24	26.8	245	44400	10	53	26700	1940	50000	4	19700	0.5	44	4	940	19	0.36	4	21	2	973
November	17.38	6.64	24	406	44900	3	677	23000	2060	53000	4	24200	0.6	42	4	739	18	0.170	3	21	2	1040
December	15.52	6.87	15	390	38300	1	174	12800	2230	55200	4	21900	0.7	40	4	688	19	0.280	4	20	2	1030

Total Cake Hauled (dry ton) = 220.10

Appendix F
2019 Bypass Event Report

Date of Event	Location	Type	Duration (time)	Estimate volume m^3	Reason (code)
April 15, 2019	Main East & Cameron Street intersection	CSO	4 hours 1 minute and 21 seconds	1440	1
April 19, 2019	Main East & Cameron Street intersection	CSO	2 minutes	12	1
April 20, 2019	Main East & Cameron Street intersection	CSO	9 hours 17 minutes and 8 seconds	3342.8	1
May 10, 2019	Main East & Cameron Street intersection	CSO	6 minutes and 42 seconds	40.2	1
May 20, 2019	Main East & Cameron Street intersection	CSO	14 minutes and 11 seconds	85.1	1
May 23, 2019	Main East & Cameron Street intersection	CSO	44 minutes and 42 seconds	268.2	1
June 2, 2019	Main East & Cameron Street intersection	CSO	41 minutes and 35 seconds	249.5	1
June 25, 2019	Main East & Cameron Street intersection	CSO	4 minutes 28 seconds	26.8	1
July 5, 2019	Main East & Cameron Street intersection	CSO	5 minutes 31 seconds	33.1	1
July 11, 2019	Main East & Cameron Street intersection	CSO	3 minutes 53 secondes	23.3	1
July 11, 2019	Main East & Cameron Street intersection	CSO	24 minutes 6 secondes	144.6	1
July 20, 2019	Main East & Cameron Street intersection	CSO	6 minutes 27 seconds	38.7	1
August 9, 2019	Main East & Cameron Street intersection	CSO	7 minutes 34 seconds	45.4	1
September 23, 2019	Main East & Cameron Street intersection	CSO	9 minutes 22 secondes	56.2	1
October 1, 2019	Main East & Cameron Street intersection	CSO	52 minutes	312	1
October 31, 2019	Main East & Cameron Street intersection	CSO	23 minutes 11 secondes	139.1	1
November 1, 2019	Main East & Cameron Street intersection	CSO	5h58 minutes 34 secondes	2151.4	1

Type
PB (Primary Bypass)
SB (Secondary Bypass)
STPO (Sewage Treatment Plant Overflow)
PSO (Pumping Station Overflow)
CSO (Combined Sewer Overflow)

Reason Codes	
1 : Heavy Precipitation	5 : Sewer Problems
2 : Snow Melt	6 : Power Failure
3 : Equipment Failure	7 : Exceed Design Capacity
4 : Maintenance/upgraded	O : Others

Appendix G
2019 Annual Bypass Summary Report

Month	WasteWater Treatment Plant Primary Bypass		
	Number (days)	Duration (minutes)	Estimated Volume (m^3)
January	0	0	0.0
February	0	0	0.0
March	0	0	0.0
April	3	799	4794.8
May	3	66	393.5
June	2	46	276.3
July	4	40	239.7
August	1	7	45.4
September	1	9	56.2
October	2	75	451.1
November	1	359	2151.4
December	0	0	0.0
Total	17	1401	8408.4
Volume of Bypass as % of Average Daily			0.318%