Township of
SEVERN

Wastewater Treatment and Collection System

Coldwater
2020 Annual Report

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Introduction

The Township of Severn prepared the 2020 annual summary report for the Coldwater Water Pollution Control Plant (WPCP).

This report summarizes notable operating events, repairs and maintenance, non-compliance issues, effluent quality, sludge quantity, and flow data for 2020. This report is based on operating data collected and compiled by the Township of Severn.

Summary of Monitoring Requirements

Table 6 lists the parameters that must be monitored, and the monitoring frequency as stated in Amended Certificate of Approval (C of A) No. 3832-6S2QCH, issued by the Ministry of the Environment, Conservation and Parks (MECP) on March 6, 2009.

Raw Sewage Quality

Table 1 illustrates the monthly and annual average raw sewage quality results..

Table 1: 2020 Monthly Raw Influent Quality

	$CBOD_5$ (mg/L)	**TSS** (mg/L)	**Total Phosphorus** (mg/L)	**TKN** (mg/L)
January	127	127	2.00	21.0
February	105	94	2.46	26.6
March	64	63	1.16	13.1
April	72	70	1.76	18.2
May	83	65	2.16	22.3
June	67	66	2.03	23.7
July	135	99	2.96	29.9
August	113	71	2.81	25.9
September	114	92	2.60	27.1
October	98	67	2.04	23.7
November	69	47	1.84	21.3
December	72	56	1.65	21.2
Average	93	76	2.15	22.8

Effluent Quality

Tables 2 & 3 illustrate the monthly and annual average effluent quality results. All exceedances of limits and objectives are outlines in section 10.

Table 2: 2020 Monthly Average Effluent Quality

	TKN *(as Nitrogen)* (mg/L)	**Alkalinity** *(as $CaCO_3$)* (mg/L)	**Temperature** (°C)	**Unionized Ammonia** *(as Nitrogen)* (mg/L)	**Nitrite** *(as Nitrogen)* (mg/L)	**Nitrate** *(as Nitrogen)* (mg/L)
January	3.1	212	11.4	0.009	0.6	12.9
February	0.7	155	10.3	0.001	0.5	23.6
March	4.0	212	11.4	0.021	0.9	9.5
April	1.7	188	9.7	0.003	1.7	14.4
May	2.0	149	15.8	0.001	0.11	23.1
June	0.6	162	19.4	0.002	0.15	20.8
July	1.5	151	23.2	0.003	0.16	18.8
August	0.9	144	22.5	0.002	0.03	23.1
Septemb	0.7	187	21.2	0.002	0.03	20.2
October	0.5	195	19.3	0.002	0.03	20.5
Novembe	1.5	193	16.5	0.001	0.04	21.6
Decembe	2.7	231	14.4	0.015	0.40	14.1

Table 3: 2020 Monthly Average Effluent Quality - Continued

	Effluent ADF	$CBOD_5$		TSS		Total Phosphorus		Total Ammonia (Nitrogen)				pH	E. Coli
	m^3/day	mg/l	kg/d	mg/l	kg/d	mg/l	kg/d	mg/L	kg/d	mg/L	kg/d		CFU/100mL
								May 15 - Oct		Oct 16 - May			
Effluent		10	9.21	10	9.21	0.3	0.28	1	0.92	3	2.76	6.0 -	
Effluent Limit		15	13.8	15	13.8	0.5	110	--	--	--	--	6.0 -	<200
January	768	3.6	2.76	12.0	9.22	0.15	0.12			2.1	1.61	7.6	2
February	477	2.5	1.19	5.5	2.62	0.10	0.05			0.10	0.05	7.6	1.5
March	1064	4.3	4.58	12.3		0.10	0.11			3.4	3.62	7.5	4.0
April	731	2.2	1.61	7.2	5.26	0.07	0.05			1.1	0.80	7.1	2.0
May	562	2.0	1.12	5.5	3.10	0.10	0.06	0.10	0.06			7.3	2.0
June	603	2.0	1.21	4.5	2.71	0.10	0.06	0.20	0.12			7.3	2.0
July	577	2.0	1.15	7.4	4.27	0.11	0.06	0.50	0.29			7.1	125.5
August	600	2.0	1.20	5.5	3.30	0.08	0.05	0.1	0.06			7.4	2.5
September	598	2.0	1.20	6.4	3.83	0.11	0.07	0.1	0.06			7.8	11.6
October	611	1.8	1.10	6.5	3.97	0.12	0.07			0.1	0.06	7.8	3.5
November	624	2.0	1.25	4.5	2.81	0.06	0.04			0.1	0.06	7.8	10.5
December	831	3.6	2.99	7.8	6.48	0.06	0.05			1.5	0.25	7.7	2.8

Influent Flows

The rated capacity of the Coldwater WPCP is 921 m3/day (average daily flow) with a peak flow rate of 3,420 m3/day, as listed in the C of A

Table 4: Summary of Influent Flows

	Total Monthly Flow (m^3)	**Average Daily Flow** (m^3/day)	**Average Daily Flow** (Percentage of Rated Capacity)	**Peak Daily Flow** (m^3/day)	**Peak Daily Flow** (Percentage of Rated Capacity)	**Peak Daily Flow** (Percentage of Rated Peak Flow)
January	23809	768	83%	1376	149%	40%
February	13828	477	52%	687	75%	20%
March	31910	1064	115%	1801	196%	53%
April	21935	731	79%	1181	128%	35%
May	17432	562	61%	702	76%	21%
June	18075	603	65%	1496	162%	44%
July	17892	577	62%	748	81%	22%
August	18615	600	65%	1035	112%	30%
September	17934	598	65%	939	102%	27%
October	18935	611	66%	795	86%	23%
November	18726	624	68%	1027	112%	30%
December	25764	831	90%	1079	117%	32%
Average	20404	671	73%	1072	116%	31%
Max	31910	1064	115%	1801	196%	53%
Total	244855					

Figure 1: Coldwater WPCP 2020 Total Monthly Flow (m3)

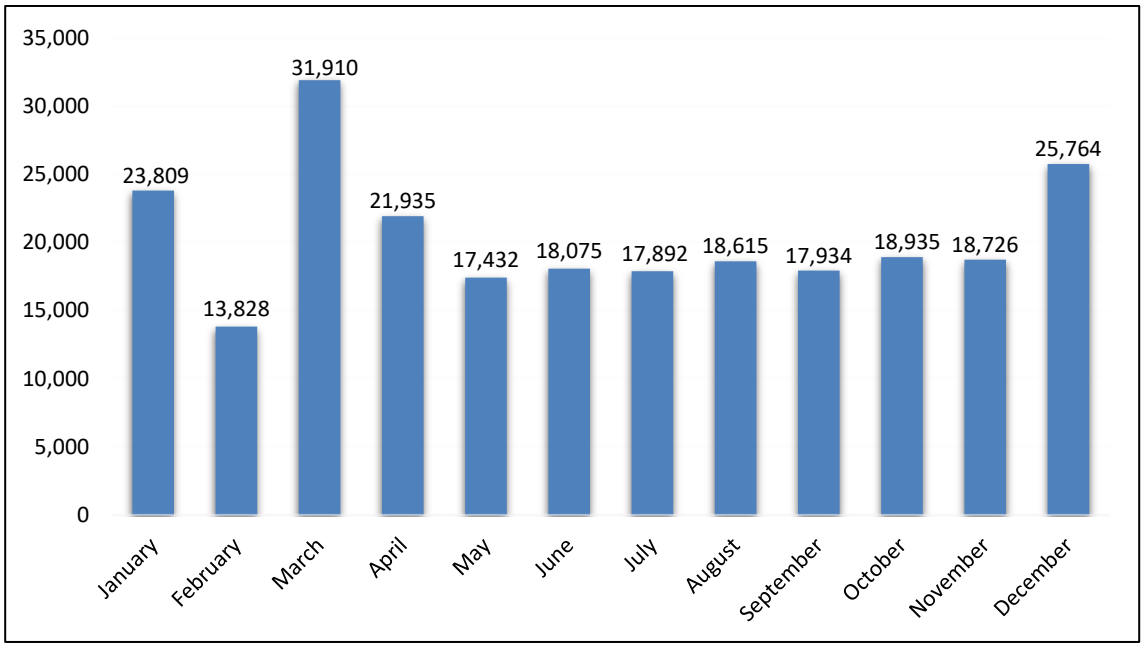
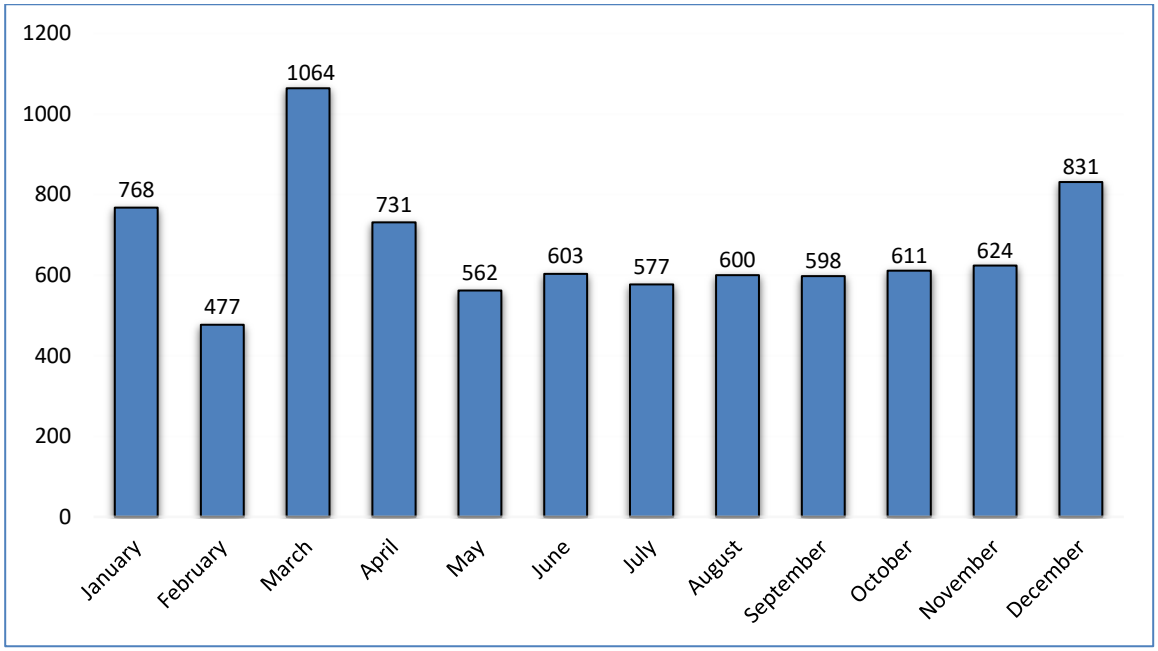


Figure 2: Coldwater WPCP 2020 Average Daily Flow (m3)



Sludge Analysis

The results of the sludge analysis are summarized in Table 5.

Table 5: Sludge Analysis

Parameter	Limits	Annual Average	
Units	Metal Concentration (mg/kg)	Sludge Concentration (mg/L)	Metal Concentration
Total Solids	-	20013	-
Ammonia +	-	7.0	-
TKN	-	642	-
Nitrate + Nitrite	-	27	-
Phosphorus	-	588	-
Arsenic	170	0.2	7
Cadmium	34	0.012	1
Cobalt	340	0.030	2
Chromium	2,800	0.483	47
Copper	1,700	7	408
Mercury	11	0.023	4
Potassium	-	53	-
Molybdenum	94	0.091	5
Nickel	420	0.330	27
Lead	1,100	0.327	19
Selenium	34	0.100	6
Zinc	4,200	10.54	535
E. Coli (cfu/1g	<2,000,000	129673	

1-Limits for metal concentration in sludge are listed in MECP publication "Guideline for the Utilization of Bio solids and other wastes on Agricultural Lands" as referenced in the Certificate of Approval No. 7383-4LAHXD

Operational Issues and Corrective Actions

There were three operational objective exceedances in 2020. Operational exceedances are outlined in section 10. There were NO corrective actions in 2020.

Maintenance Summary

All maintenance that was completed in 2020 on major structures, apparatus and/or mechanical equipment is summarized below.

Water Pollution Control Plant

The following is a list of preventative and emergency maintenance completed at the WPCP in 2020:

- All critical alarms were tested on a monthly basis.
- All floats were inspected and cleaned on a monthly basis.
- The backup generator was tested monthly under load.
- The blowers and air compressor were serviced yearly to check belts, alignment, motor function and lubrication.
- Replaced U.V bulbs and sleeves.
- Repaired motor on comminutor and clarifier
- Rebuilt clarifier drive.

Collection System

The following is a list of preventative and emergency maintenance completed on the collection system in 2020:

- Sewage Pump stations were cleaned to remove grease, grit and other debris.
- All sewage pumping station alarms were tested on a monthly basis.
- All floats in the sewage pumping stations were inspected and cleaned on a monthly basis.
- Debris was removed from several pumps in the sewage pumping stations as warranted.
- Flushed approximately 3754 m of sewer main.
- Inspected 2,207 m of sewer main by video camera to identify any necessary repairs.
- Approximately 25% of the manholes were inspected.
- Replaced guide rails on pump station (hardware)
- Replaced guide rails on pump station (Main)

Summary of Effluent Quality Assurance or Control Measures

Table 1 summarizes which effluent parameters are analyzed by the accredited laboratory, SGS Lakefield Research, Aquatic Laboratories or Caduceon Laboratories, and which parameters are analyzed in-house.

The results of the sludge analysis are summarized in Table 6.

Table 6: Summary of Monitoring Requirements

**Note: SGS Lakefield & Caduceon are both MECP approved accredited laboratories

Source	Parameter	Required	Method
Raw Influent	$CBOD_5$	Monthly	SGS Lakefield or Caduceon
	Total Suspended Solids	Monthly	SGS Lakefield or Caduceon
	Total Phosphorus	Monthly	SGS Lakefield or Caduceon
	Total Kjeldahl	Monthly	SGS Lakefield or Caduceon

Table 1: Summary of Monitoring Requirements

**Note: SGS Lakefield & Caduceon are both MECP approved accredited laboratories

Source	Parameter	Required Frequency	Method
Final Effluent	Flow	Daily	SGS Lakefield or Caduceon
	$CBOD_5$	Weekly	SGS Lakefield or Caduceon
	Total Suspended Solids	Weekly	SGS Lakefield or Caduceon
	Total Phosphorus	Weekly	SGS Lakefield or Caduceon
	Total Ammonia Nitrogen	Weekly	SGS Lakefield or Caduceon
	Nitrate Nitrogen	Weekly	SGS Lakefield or Caduceon
	E. Coli	Weekly	SGS Lakefield or Caduceon,
	Total Chlorine Residual	Weekly	N/A (UV disinfection)
	pH	Weekly	In House Grab Sample
	Temperature	Weekly	In House Grab Sample
	Unionized Ammonia	Weekly	SGS Lakefield or Caduceon

In-house tests are conducted by licensed operators for monitoring purposes. Standard Methods are used by the operators and the test results are utilized for process control. All in-house monitoring equipment is calibrated based on the manufacturer's recommendations.

Efforts and Results in Meeting Effluent Objectives of Certificate of Approval

The WPCP is operated and maintained such that all effluent quality objectives are strived for. Objectives and limits are based on a monthly average.

The TSS objective is 10mg/L and Total Ammonia is 3mg/L from Oct. 16 to May 14. The following objectives were not:

TSS- January-12.0mg/L

TSS-March-12.3mg/L

Total Ammonia-March-3.4mg/L

All other effluent quality parameters were maintained within the compliance limits of the C of A.

Sludge Volume and Disposal

Table 7 below summarizes the sludge volume generated in 2020, the anticipated volume to be generated next year, and the sludge disposal location.

Table 7: Sludge Generated and Disposal

Sludge Generated in 2020 (m^3)	Anticipated Volume for 2021 (m^3)	Sludge Disposal Location
756	1100	Lot 20 NASM Plan 23112

Summary of Complaints

There were no sewer complaints received in 2020.

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a qualified Contractor on March 4, 2020.

All in-house monitoring equipment is calibrated based on manufacturer's recommendations.

Summary of By-Pass, Spills or Abnormal Discharge Events

There were no bypasses, spills, or abnormal discharge events in 2020