



— Township of —

**SEVERN**

Wastewater Treatment and Collection System

# **Coldwater 2021 Annual Report**

# Table of Contents

Introduction .....	2
Summary of Monitoring Requirements.....	2
Raw Sewage Quality .....	2
Effluent Quality .....	3
Influent Flows.....	6
Sludge Analysis.....	8
Operational Issues and Corrective Actions .....	9
Maintenance Summary .....	9
Water Pollution Control Plant .....	9
Collection System .....	9
Summary of Effluent Quality Assurance or Control Measures .....	10
Efforts and Results in Meeting Effluent Objectives of Certificate of Approval .....	11
Sludge Volume and Disposal.....	11
Summary of Complaints .....	11
Summary of Calibration and Maintenance on Effluent Monitoring Equipment.....	12
Summary of By-Pass, Spills or Abnormal Discharge Events.....	12

# Introduction

The Township of Severn prepared the 2021 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 2021. 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: 2021 Monthly Raw Influent Quality

Month	CBOD <sub>5</sub> (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	68	64	3.19	26.3
February	71	94	3.94	25.4
March	53	164	3.11	25.0
April	40	92	3.05	28.2
May	48	93	3.59	30.4
June	108	188	6.20	53.7
July	96	142	4.22	35.3
August	126	176	3.29	41.6
September	152	135	3.91	37.0
October	68	72	2.60	27.2
November	67	66	1.98	19.6
December	66	75	2.36	23.0
Average	82	119	3.50	31.7

## Effluent Quality

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

Table 2: 2021 Monthly Average Effluent Quality

<b>Month</b>	<b>TKN</b> <i>(as Nitrogen)</i> (mg/L)	<b>Alkalinity</b> <i>(as CaCO<sub>3</sub>)</i> (mg/L)	<b>Temperature</b> (°C)	<b>Unionized Ammonia</b> <i>(as Nitrogen)</i> (mg/L)	<b>Nitrite</b> <i>(as Nitrogen)</i> (mg/L)	<b>Nitrate</b> <i>(as Nitrogen)</i> (mg/L)
January	1.1	153	11.3	0.008	1.18	21.48
February	2.0	137	9.6	0.010	4.53	20.85
March	4.1	192	10.7	0.020	6.38	9.26
April	1.2	162	13.8	0.010	0.15	20.95
May	4.0	168	14.3	0.020	0.65	21.08
June	1.1	111	19.6	0.010	0.18	30.02
July	2.0	119	18.6	0.010	0.10	25.43
August	0.9	85	22.8	0.008	0.86	30.28
September	0.5	108	21.0	0.001	0.03	27.70
October	1.3	163	19.9	0.001	0.03	20.70
November	1.0	208	16.5	0.001	0.03	17.93
December	0.5	2130	12.6	0.001	0.03	16.10

Table 3: 2021 Monthly Average Effluent Quality - Continued

Month	Effluent ADF	CBOD <sub>5</sub>		TSS		Total Phosphorus		Total Ammonia (Nitrogen)				pH	E. Coli
	m <sup>3</sup> /day	mg/l	kg/d	mg/l	kg/d	mg/l	kg/d	mg/L	kg/d	mg/L	kg/d		CFU/100
								May 15 - Oct 15	Oct 16 - May 14				
Effluent Objective		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	694	2.8	1.94	8	5.55	0.11	0.08	--	--	0.14	0.10	7.6	74.5
February	542	3.5	1.90	8.5	4.61	0.19	0.10	--	--	0.42	.23	7.5	30
March	973	3.4	3.31	8	7.78	0.17	0.17	--	--	2.46	2.39	7.5	22
April	761	3.0	2.28	7.5	5.70	0.10	0.08	--	--	0.07	0.05	7.4	13
May	531	3.0	1.59	6.8	3.61	0.09	0.05	1.71	0.90	--	--	7.4	9.5
June	389	3.0	1.17	4.8	1.87	0.11	0.05	0.08	0.03	--	--	7.3	12
July	543	5.8	3.15	10.5	5.70	0.19	0.10	0.21	0.11	--	--	7.3	15.5
August	461	2.8	1.29	4.8	2.21	0.06	0.03	0.05	0.02	--	--	7.4	13
September	581	2.0	1.16	5	2.91	0.06	0.03	0.10	0.06	--	--	7.5	2
October	643	2.0	1.29	3.8	2.44	0.10	0.06	0.10	0.06	--	--	7.5	53
November	793	2.0	1.59	5.3	4.20	0.07	0.06	--	--	0.10	0.08	7.5	2
December	991	2.6	2.58	3.8	2.58	0.05	0.05	--	--	0.10	0.10	7.7	2.8

## Influent Flows

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

Table 4: Summary of Influent Flows

<b>Month</b>	<b>Total Monthly Flow (m<sup>3</sup>)</b>	<b>Average Daily Flow (m<sup>3</sup>/day)</b>	<b>Average Daily Flow (Percentage of Rated Capacity)</b>	<b>Peak Daily Flow (m<sup>3</sup>/day)</b>	<b>Peak Daily Flow (Percentage of Rated Capacity)</b>	<b>Peak Daily Flow (Percentage of Rated Peak Flow)</b>
January	21526	694	75%	865	94%	25%
February	15169	542	59%	761	83%	22%
March	30168	973	106%	2005	218%	59%
April	22823	761	83%	965	105%	28%
May	15412	531	58%	862	94%	25%
June	11679	389	42%	644	70%	19%
July	16831	543	59%	700	76%	20%
August	14286	461	50%	580	63%	17%
September	17415	581	63%	1490	162%	44%
October	19938	643	70%	854	93%	25%
November	23780	793	86%	1055	115%	31%
December	30733	991	108%	1699	184%	50%
Average	19980	661	72%	1040	113%	30%
Max	30733	991	108%	2005	218%	59%
Total	239762					

Figure 1: Coldwater WPCP 2021 Total Monthly Flow (m3)

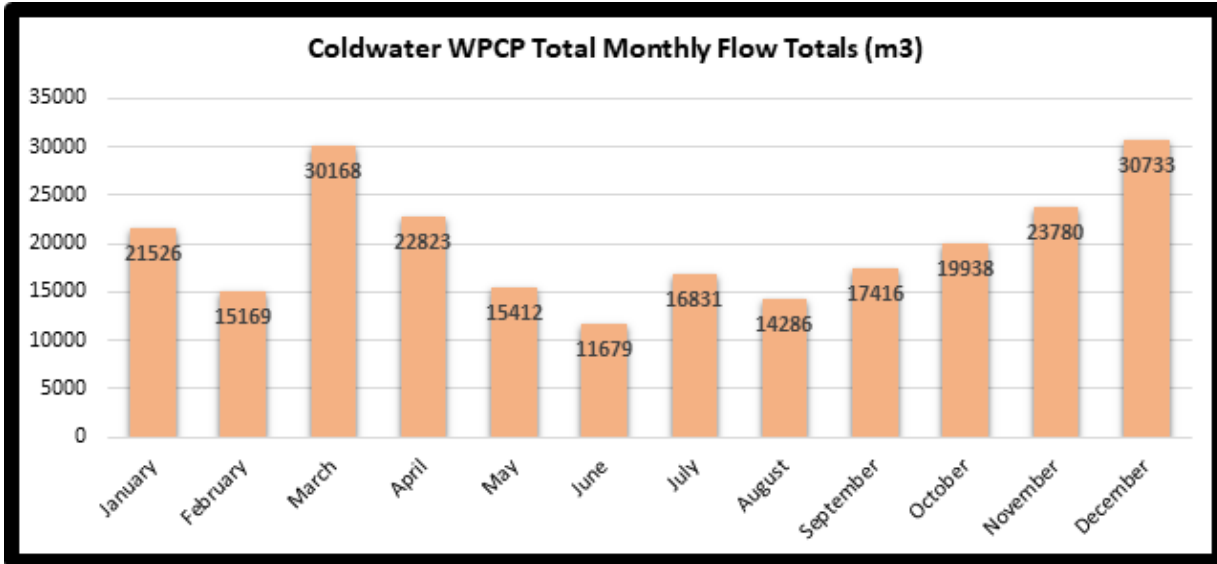
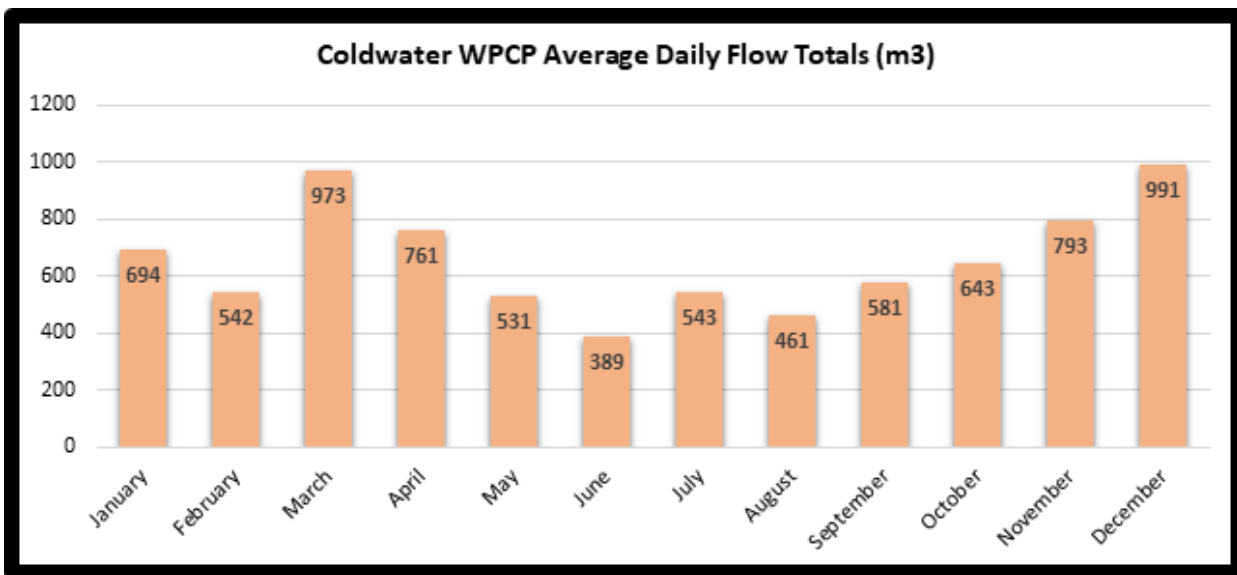


Figure 2: Coldwater WPCP 2021 Average Daily Flow (m3)



# Sludge Analysis

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

Table 5: Sludge Analysis

<b>Parameter</b>	<b>Limits</b>	<b>Annual Average</b>	
<b>Units</b>	<b>Metal Concentration</b>	<b>Sludge Concentration (mg/L)</b>	<b>Metal Concentration</b>
Total Solids	--	14142	--
Ammonia +	--	3	--
TKN	--	610	--
Nitrate + Nitrite	--	27	--
Phosphorus	--	392	--
Arsenic	170	0.1	7
Cadmium	34	0.02	1
Cobalt	340	0.028	2
Chromium	2,800	0.638	45
Copper	1,700	4.7	333
Mercury	11	0.01	0.73
Potassium	--	50	--
Molybdenum	94	0.596	42
Nickel	420	0.343	24
Lead	1,100	0.175	12
Selenium	34	0.100	7
Zinc	4,200	7.6	534
E. Coli (cfu/1g)	<2,000,000	65571	

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 two (2) operational objective exceedances in 2021. Operational exceedances are outlined in section 10. There were NO corrective actions in 2021.

## Maintenance Summary

All maintenance that was completed in 2021 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 2021:

- 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.
- Replaced roof on MCC and sludge buildings
- Rebuilt clarifier skimmer arms and waste channel.
- Environmental Assessment started for plant expansion.

### Collection System

The following is a list of preventative and emergency maintenance completed on the collection system in 2021:

- 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 5010 m of sewer main.

- Inspected 2240 m of sewer main by video camera to identify any necessary repairs.
- Approximately 25% of the manholes were inspected.

## 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 <sub>5</sub>	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	Method
Final Effluent	Flow	Daily	SGS Lakefield or Caduceon
	CBOD <sub>5</sub>	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 1mg/L from May 15 to Oct 15. The following objectives were exceeded:

TSS- July-10.5mg/L

Total Ammonia-May-1.71mg/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 2021, the anticipated volume to be generated next year, and the sludge disposal location.

Table 7: Sludge Generated and Disposal

Sludge Generated in 2021 (m <sup>3</sup> )	Anticipated Volume for 2022 (m <sup>3</sup> )	Sludge Disposal Location
1176	1200	Lot 10, 11 NASM Plan 24760
		ROHES Lagoon 4
		ROHES Lagoon 5 and 7

## Summary of Complaints

There were two sewer complaints received in 2021.

- On December 11, 2021, received 2 sewer back-up complaint. Back-ups caused from power outages from major storm.

# Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a qualified Contractor on March 1, 2021.

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 2021.