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SEVERN

Wastewater Treatment and Collection System

Westshore

2022 Annual Report

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Introduction

The Township of Severn prepared the 2022 annual summary report for the Westshore Wastewater Treatment Plant (WWTP).

This report summarizes notable operating events, repair and maintenance, non-compliance issues, effluent quality, sludge quantity and flow data for 2022. 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 the Certificate of Approval (C of A) No. 6791-62EJW5, issued by the Ministry of the Environment, Conservation and Parks (MECP) on June 29, 2004.

Raw Sewage Quality

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

Table 1: 2022 Monthly Raw Influent Quality

	CBOD5 (mg/L)	TSS (mg/L)	Total Phosphorus (mg/L)	TKN (mg/L)
January	191	206	5.09	47.1
February	100	154	2.48	19.8
March	49	280	2.70	25.5
April	101	154	2.63	26.4
May	127	173	4.01	40.3
June	174	218	5.54	50.7
July	161	148	4.00	38.8
August	198	127	6.89	79.8
September	217	210	5.84	59.4
October	170	234	6.56	61.1
November	225	156	3.00	40.8
December	156	122	3.45	35.6
Average	156	182	4.35	43.8

Effluent Quality

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

Table 2: 2022 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	1.0	86	10.9	0.001	0.72	16.40
February	6.2	145	11.0	0.023	0.89	7.62
March	3.2	166	8.9	0.014	0.09	9.25
April	1.2	179	10.9	0.003	0.05	6.97
May	0.7	122	12.9	0.002	0.14	8.64
June	0.5	121	15.9	0.002	0.05	7.74
July	1.2	105	18.8	0.001	0.04	4.22
August	0.8	94	19.9	0.001	0.07	4.97
Septemb	1.7	74	19.1	0.002	0.06	10.96
October	0.5	67	16.3	0.001	0.06	14.43
Novembe	0.8	68	14.7	0.001	0.05	17.50
Decembe	0.7	90	12.5	0.001	0.11	18.15

Table 3: 2022 Monthly Average Effluent Quality - Continued

	Effluent ADF	CBOD5		TSS		Total Phosphorus		Total Ammonia (Nitrogen)				pH	E. Coli
	m3/day	mg/	kg/d	mg/	kg/d	mg/l	kg/d	mg/L	kg/d	mg/l	kg/d		CFU/100m
								May 1 – Nov.	Dec. 1 – Apr.				
Objective		5.0		5.0		0.12		2.0		5.0		6 - 9.5	
Limit		10.0		10.0		0.15		3.0		7.0		6 - 9.5	<200
January	759	6.3	4.78	5.0	3.80	0.11	0.08	--	--	0.1	0.08	7.38	3
February	815	3.5	2.85	6.8	5.54	0.12	0.10	--	--	5.6	4.56	7.30	2
March	1096	3.4	3.73	7.0	7.67	0.09	0.10	--	--	2.8	3.07	7.50	3
April	1105	2.0	2.21	3.5	3.87	0.04	0.04	--	--	0.30	0.33	7.55	2
May	784	3.2	2.51	2.6	2.04	0.06	0.05	0.20	0.16	--	--	7.62	2
June	839	2.0	1.68	2.5	2.10	0.05	0.04	0.10	0.08	--	--	7.75	2
July	720	2.0	1.44	4.3	3.10	0.05	0.04	0.10	0.07	--	--	7.73	2
August	729	2.0	1.46	2.0	1.46	0.06	0.04	0.10	0.07	--	--	7.60	2
September	683	2.3	1.57	2.0	1.37	0.05	0.03	0.10	0.07	--	--	7.73	2
October	716	2.0	1.43	2.3	1.65	0.05	0.04	0.10	0.07	--	--	7.60	1.5
November	709	2.0	1.42	3.4	2.41	0.04	0.03	0.10	0.07	--	--	7.58	2
December	829	2.3	1.91	2.3	1.91	0.05	0.04	--	--	0.10	0.08	7.73	1.5

Influent Flows

The rated capacity of the Westshore WWTP is 1,390 m³/day (ADF - average daily flow), with a peak flow rate of 4,768 m³/day, as listed in the C of A.

As shown in Table 4 and Figures 1 and 2, all flows were below the ADF rated capacity and the peak flow capacity of the plant during 2022.

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	19670	635	45%	724	52%	15%
February	19594	700	50%	1152	83%	24%
March	29860	963	69%	1385	100%	29%
April	28976	966	69%	1183	85%	25%
May	21140	682	49%	851	61%	18%
June	21392	713	51%	971	70%	20%
July	17890	577	42%	661	48%	14%
August	17670	570	41%	706	51%	15%
September	16215	541	39%	646	46%	14%
October	18295	590	42%	769	55%	16%
November	17678	589	42%	902	65%	19%
December	22040	711	51%	1371	99%	29%
Average	20868	686	49%	943	68%	20%

Figure 1: Westshore 2022 Total Monthly Flow (m3)

Westshore WPCP Monthly Flow Average Totals (m³)

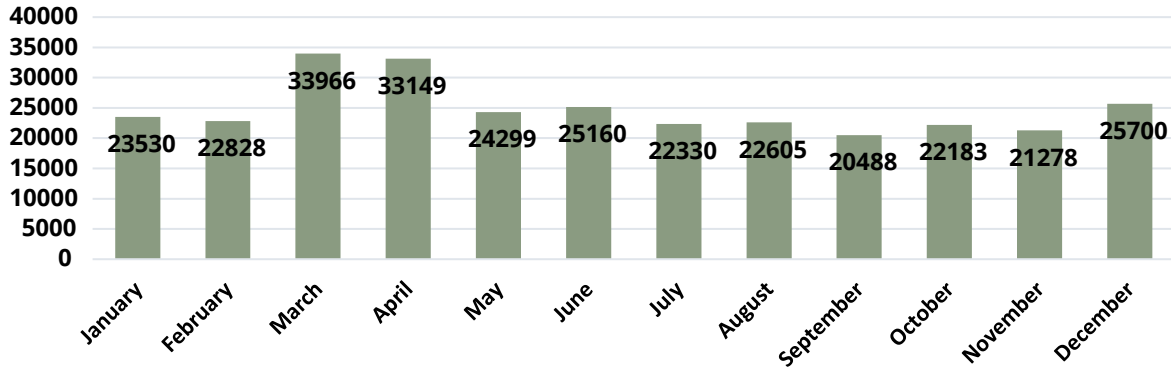
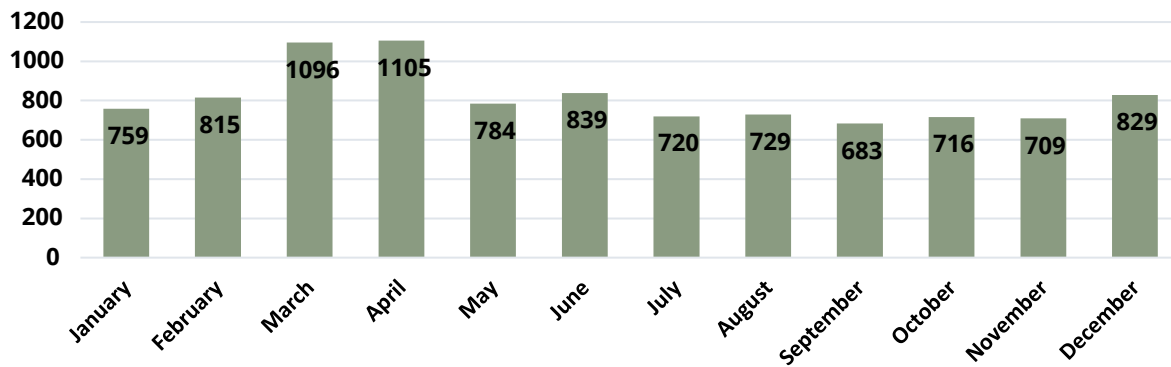


Figure 2: Westshore 2022 Daily Average Flow (m3)

Westshore Daily Flow Average Totals (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	-	10917	-
Ammonia +	-	6.8	-
TKN	-	483	-
Nitrate + Nitrite	-	67	-
Phosphorus	-	269	-
Arsenic	170	0.1	10
Cadmium	34	0.007	1
Cobalt	340	0.02	2
Chromium	2800	0.11	10
Copper	1700	2.7	246
Mercury	11	0.003	0
Potassium	-	40	-
Molybdenum	94	0.05	6
Nickel	420	0.12	11
Lead	1100	0.1	11
Selenium	34	0.1	11
Zinc	4,200	4.3	362
E.Coli (cfu/1 gm)	<2,000,000	170980	

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 no operational issues in 2022 as outlined in section 10. There were NO corrective actions in 2022.

Maintenance Summary

All maintenance completed in 2022 on major structures, apparatus and/or mechanical equipment is summarized below.

Wastewater Treatment Plant

The following is a list of preventative and emergency maintenance completed at the WWTP in 2022:

- All critical alarms were tested monthly.
- All floats were inspected and cleaned monthly.
- The backup generator was tested monthly under load.
- The blowers and air compressor were serviced yearly to check belts, alignment, motor function and lubrication. The standby blower was run once a week.
- Equalization and reject tanks were drawn down and cleaned as needed.
- Plant headworks and Parkson filter headworks were drawn down and cleaned as needed.
- Replaced Parkson filter air feed tubes.
- Maintained filter media.
- New blower installed.
- Installed back-up air compressor for parkson filters.
- Cleaned SBR 1.

Collection System

The following is a list of preventative and emergency maintenance completed on the sewer system in 2022:

- Sewage pump stations were cleaned to remove grease, grit, and other debris.
- All sewage pumping station alarms were tested monthly.
- All floats in the sewage pumping stations were inspected and cleaned monthly.

- Debris was removed from several pumps in the sewage pumping stations as warranted.
- Flushed approximately 8709 m of sewer main.
- Inspected 2518 m of sewer main by video camera to identify any necessary repairs.
- Approximately 25% of the manholes were inspected. Repairs were made as required.
- Replaced sewage pumps at Timberline, Grayshott and Bramshott pump stations.

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.

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.

Table 6: Summary of Monitoring Requirements

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

Source	Parameter	Required Frequency	Method
Raw Influent	CBOD5	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
Final Effluent	Flow	Daily	SGS Lakefield or Caduceon
	CBOD5	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
	Total Kjeldahl Nitrogen	Weekly	SGS Lakefield or Caduceon
	Nitrate	Weekly	SGS Lakefield or Caduceon
	Nitrite	Weekly	SGS Lakefield or Caduceon
E.Coli	Weekly	SGS Lakefield or Caduceon	

	PH	Weekly	In House Grab Sample
	Alkalinity	Weekly	SGS Lakefield or Caduceon
	Temperature	Weekly	SGS Lakefield or Caduceon
	Unionized Ammonia	Weekly	SGS Lakefield or Caduceon

Efforts and Results in Meeting Effluent Objectives of Certificate of Approval

The WWTP is operated and maintained such that all effluent quality objectives are strived for. Objectives and limits are based on a monthly average. There were four monthly average lab results that exceeded the plant objective in 2022.

- January CBOD (Carbonaceous biochemical oxygen demand) exceeded the objective of 5mg/L. January monthly CBOD average was 6.3 mg/L.
- February TSS (Total suspended solids) exceeded the objective of 5 mg/L. February monthly average was 6.8 mg/L.
- March TSS exceeded the objective of 5mg/L. March monthly average was 7.0 mg/L.
- February Total Ammonia exceeded the objective of 5 mg/L. February monthly average was 5.6 mg/L.

Sludge Volume and Disposal

Table 7 below summarizes the sludge volume generated in 2022, the anticipated volume to be generated next year, and the sludge disposal location.

Table 7: Sludge Generated and Disposal

Sludge Generated in 2022 (m3)	Anticipated Volume for 2023 (m3)	Sludge Disposal Location
313	--	NASM #24503 Parker Beauchenim Con. 13, Lot 2 Essa
597	--	NASM #23920 Hoffman Con. 3 Lot 9 Oro-Medonte
1846.80	4000(m3)	--Rohes lagoon #4 and #7

Summary of Complaints

The were no complaints in 2022 related to Municipal infrastructure.

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a certified technician on March 23, 2022.

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 2022.