Township of SEVERN

Wastewater Treatment and Collection System

Westshore

2024 Annual Report

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Introduction

The Township of Severn prepared the 2024 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 2024. 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: 2024 Monthly Raw Influent Quality

Month	**$CBOD_5$** (mg/L)	**TSS** (mg/L)	**Total Phosphorus** *(mg/L)*	**TKN** *(mg/L)*
January	131	204	3.43	30.8
February	114	184	3.75	36.0
March	92	120	2.4	25.6
April	129	194	3.46	44.6
May	83	116	2.72	29.8
June	114	153	4.73	47.8
July	145	157	3.75	43.6
August	93	110	3.56	36.1
September	151	344	4.39	38.4

Month	$CBOD_5$ (mg/L)	TSS (mg/L)	Total Phosphorus *(mg/L)*	TKN *(mg/L)*
October	183	210	5.63	52.2
November	200	228	5.63	52.4
December	107	151	3.94	39.8
Average	**129**	**181**	**3.95**	**39.8**

Effluent Quality

Tables 2 and 3 illustrate the monthly and annual average effluent quality results.

Table 2: 2024 Monthly Average Effluent Quality

Month	TKN (as Nitrogen) (mg/L)	Alkalinity (as CaCO3) (mg/L)	Temperature (°C)	Unionized Ammonia (as Nitrogen) (mg/L)	Nitrite (as Nitrogen) (mg/L)	Nitrate *(as Nitrogen) (mg/L)*
January	0.7	125	11.2	0.001	0.06	12.90
February	1.7	127	11.3	0.001	0.10	13.13
March	1.3	146	11.5	0.001	0.15	9.52
April	2.0	146	12.2	0.006	0.17	6.80
May	0.9	135	14.3	0.001	0.03	7.51
June	0.8	118	17.0	0.001	0.04	7.69
July	1.1	123	18.4	0.001	0.04	5.83
August	1.2	100	20.1	0.001	0.05	4.72
September	0.8	73	21.0	0.001	0.11	8.65
October	2.8	39	17.4	0.002	0.07	15.42
November	5.1	46	15.2	0.002	0.10	13.46

Month	TKN (as Nitrogen) (mg/L)	Alkalinity (as CaCO3) (mg/L)	Temperature (°C)	Unionized Ammonia (as Nitrogen) (mg/L)	Nitrite (as Nitrogen) (mg/L)	Nitrate *(as Nitrogen) (mg/L)*
December	4.1	86	10.7	0.003	0.09	13.52
Average	**1.9**	**105**	**15.0**	**0.002**	**0.08**	**9.93**

Table 3: 2024 Monthly Average Effluent Quality

Month	Effluent ADF	CBOD		TSS		Total Phosphorus	
	m³/day	*mg/L*	*kg/d*	*mg/L*	*kg/d*	*mg/L*	*kg/d*
Effluent Objective	1390	5	6.95	5	6.95	0.12	0.17
Effluent Limit	1390	10	13.9	10	13.9	0.15	0.21
January	987	2.8	2.76	4.4	4.34	0.04	0.04
February	983	4.0	3.93	3.8	3.74	0.07	0.07
March	1188	3.5	4.16	4.3	5.11	0.05	0.06
April	1318	2.8	3.69	5.2	6.85	0.06	0.08
May	992	2.0	1.98	3.3	3.27	0.06	0.06
June	903	2.0	1.81	3.0	2.71	0.05	0.05
July	938	2.0	1.88	4.4	4.13	0.06	0.06
August	744	2.0	1.49	3.8	2.83	0.07	0.05
September	720	2.0	1.40	3.0	2.16	0.06	0.04
October	699	2.0	1.40	5.2	3.63	0.08	0.06
November	702	2.3	1.61	3.8	2.67	0.08	0.06
December	1058	3.0	3.17	5.2	5.50	0.07	0.07

Table 3: 2024 Monthly Average Effluent Quality - Continued

Month	Total Ammonia (Nitrogen)				pH	E. Coli
	mg/L	*kg/d*	*mg/L*	*kg/d*		
	May 15 - Oct 15		Oct 16 - May14			
Effluent Objective	2.0	2.78	5.0	6.95		
Effluent Limit	3.0	4.17	7.0	9.73		
January			0.1	0.09	6.82	2
February			0.2	0.19	6.58	4
March			0.2	0.23	6.63	3
April			1.5	1.97	6.80	18
May	0.1	0.09			6.48	6
June	0.1	0.09			6.38	2
July	0.2	0.18			6.64	4
August	0.3	0.22			6.68	65
September	0.2	0.14			6.33	4
October	2.4	1.67			6.30	3
November			4.5	3.15	6.23	2
December			3.7	3.91	6.50	32

Influent Flows

The rated capacity of the Westshore WWTP is 1,390 m^3/day (ADF - average daily flow), with a peak flow rate of 4,768 m^3/day, as listed in the C of A.

As shown in Table 4 and Figures 1 & 2, all flows were below the ADF rated capacity and the peak flow capacity of the plant during 2024.

Table 4: Summary of Influent Flows

Month	Total Monthly Flow (m^3)	Average Daily Flow (m^3/day)	Average Daily Flow (% of Rated Capacity)	Peak Daily Flow (m^3/day)	Peak Daily Flow (% of Rated Capacity)	Peak Daily Flow (% of Rated Peak Flow)
January	26362	850	61%	1116	80%	23%
February	24406	842	60%	1182	85%	24%
March	30324	978	70%	1322	95%	27%
April	34843	1161	83%	1649	118%	34%
May	26420	852	61%	1260	90%	26%
June	23037	768	55%	1035	74%	21%
July	23967	773	55%	1383	99%	29%
August	18825	607	43%	682	49%	14%
September	17269	576	41%	726	52%	15%
October	17923	578	41%	653	46%	13%
November	17717	591	42%	693	49%	14%
December	28729	927	66%	1532	110%	32%
Max		**1161**	**83%**	**1649**	**118%**	**34%**
Total	**289822**					

Charts

Figure 1: Westshore WWTP 2024 Average Daily Flow total values are in (m^3)

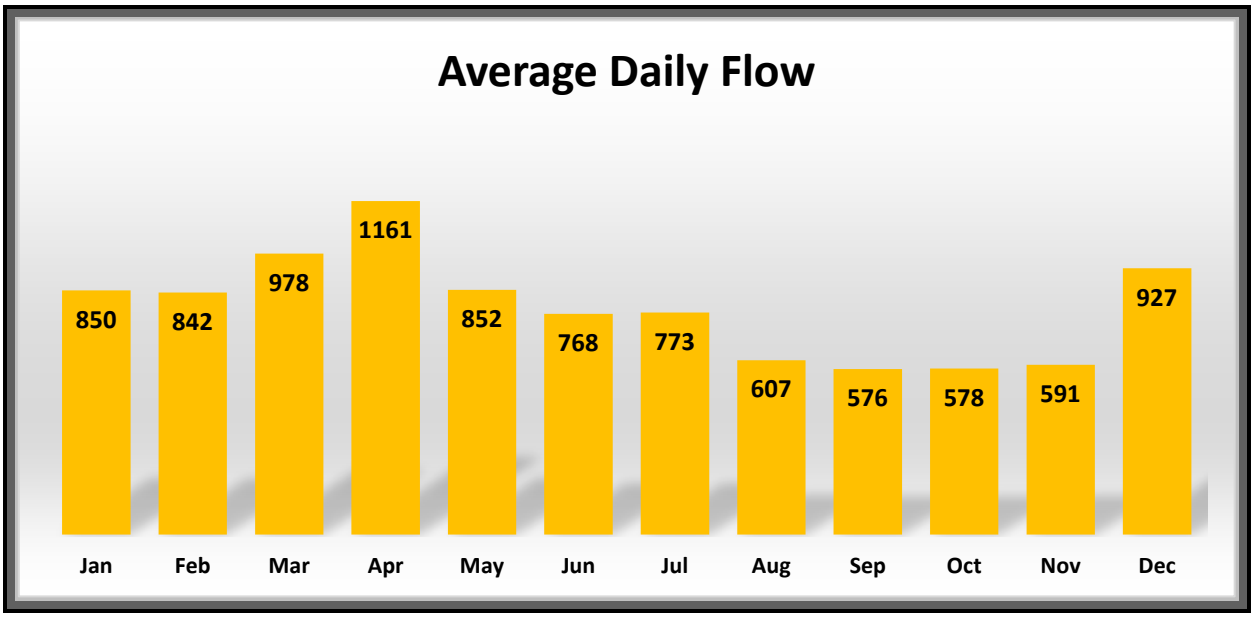
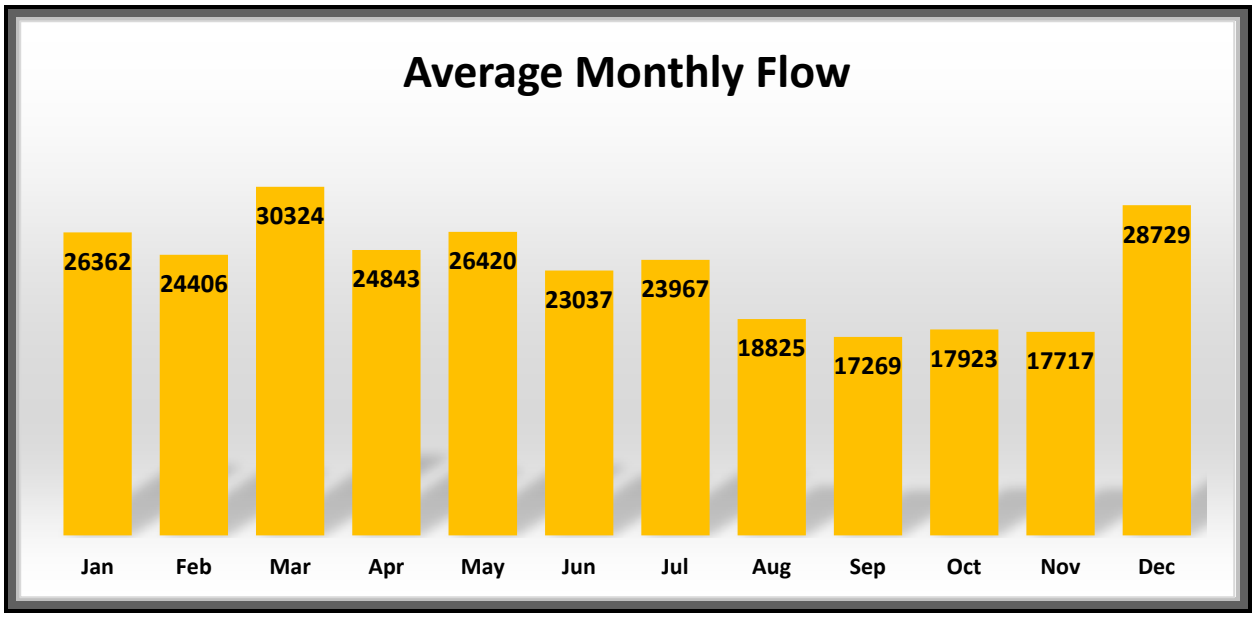


Figure 2: Westshore WWTP 2024 average monthly flow total values are in (m3)



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** *(mg/kg)*
Total Solids	-	15129	-
Ammonia +	-	5.5	-
TKN	-	615	-
Nitrate + Nitrite	-	82	-
Phosphorus	-	319	-
Arsenic	170	0.10	7
Cadmium	34	0.007	0
Cobalt	340	0.03	2
Chromium	2800	0.15	10
Copper	1700	3.2	209
Mercury	11	0.003	0
Potassium	-	39	2628
Molybdenum	94	0.06	4
Nickel	420	0.17	11
Lead	1100	0.11	8
Selenium	34	0.1	7
Zinc	4,200	5.3	308

E.Coli (cfu/1g)	< 2,000,000	110733

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

Operational issues in 2024 are listed below:

- Operational objectives for TSS were not achieved in April, October and December.
- Operational objectives for Total Ammonia were not achieved in October.

Operational objectives that exceeded C of A are highlighted in Table 3.

Westshore WPCP had three limit exceedances in 2024. Exceedances are listed below.

- In November, Total Ammonia exceeded the limit of 3.0 mg/l. Monthly average for November was 4.5 mg/l.

Operational limits that exceeded the C of A are highlighted in Table 3.

Maintenance Summary

All maintenance completed in 2024 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 2024:

- 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 compressors 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.
- SBR1 mixture pump replaced
- Supernate pump replacement.
- Reject pump replacement.
- A new alum feed system was installed.
- Rebuilt one blower.

Collection System

The following is a list of preventative and emergency maintenance completed on the sewer system in 2024:

- 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 5725 m of sewer main.
- Inspected 1475 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 Bramshott pump stations.
- Installed 45 Kw generators at Aldershott, Greyshott and Wood Ave pump stations.

Summary of Effluent Quality Assurance or Control Measures

Tables 6 and 7 summarize which 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 Raw Influent Monitoring Requirements

Source	Parameter	Required	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

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

Table 7: Summary of Effluent Monitoring Requirements

Source	Parameter	Required	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	Weekly	SGS Lakefield or Caduceon
	Nitrate	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
	Alkalinity	Weekly	SGS Lakefield or Caduceon
	Unionized Ammonia	Weekly	SGS Lakefield or Caduceon

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

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. Operational objective exceedances and limit exceedances are referenced in operational Issues and Corrective Actions section. Objectives and limits are also highlighted in table 3.

Sludge Volume and Disposal

Table 8 below summarizes the sludge volume generated in 2024, the anticipated volume to be generated next year, and the sludge disposal location.

Table 8: Sludge Generated and Disposal

Sludge Generated in 2024 *(m^3)*	**Anticipated Volume for 2025** *(m^3)*	**Sludge Disposal Location**
750.4	3500	NASM 24490 Uncle Kens, Con 8, Lot 16 Springwater
534.8		NASM 61806 Cornelius/McGann Con 10ESR Clearview
368		Rohes 4 Lagoon
336		Rohes 7 Lagoon
1218		Rohes 9 Lagoon
Total Volume – 2871.2 m^3		

Summary of Complaints

The were four complaints in 2024 related to Municipal infrastructure.

- 1 residential sewage back-up.
- 6 odor complaints.

Summary of Calibration and Maintenance on Effluent Monitoring Equipment

Magnetic flow meters were calibrated by a certified technician on February 27, 2024.

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 2024.