Meaford Wastewater Treatment Plant Annual Report for the year 2025

Environmental Compliance Approval: 9036-AZFPV6

This 2025 Report for the above-referenced facility summarizes the performance and related activities in accordance with ECA; Condition 11 (4) a through m as follows;

Table 1: Sampling Type and Frequency

Source (Composite)	Parameter	Frequency	Method
Influent	Flow (m3)	Daily	Flow Meter
	CBOD5, TSS, TP, TKN, Ammonia Nitrogen, Nitrite & Nitrate Nitrogen, Alkalinity, pH	Monthly	External Analysis
Effluent	Flow (m3)	Daily	Open Channel Flow Meter
	CBOD5, TSS, TP, TKN, Ammonia Nitrogen, Nitrite & Nitrate Nitrogen	Weekly	External Analysis
	E. Coli	Weekly	External Analysis
	pH	Weekly	In-House & External Analysis
	Temperature	Weekly	In-House & External Analysis

Introduction

The Municipality of Meaford is pleased to provide the Ministry of the Environment, Conservation and Parks (MECP) with the 2025 Annual Report for the Meaford Wastewater Treatment Plant (WWTP). In 2025 the Meaford WWTP operated under the Environmental Compliance Approval Number 9036-AZFPV6 dated October 10, 2018.

The Report is designed to inform the MECP of the quality of effluent being discharged from this plant. The entire treatment process at the Meaford Water Pollution Control Plant can best be described as a “transformation”.

A transformation from harmful wastewater into two useful end products:

a) A disinfected treated effluent
b) An agricultural liquid fertilizer

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System Description

The Meaford WWTP is a high-rate plant consisting of three remote and one onsite sewage pumping stations. The facility is located in a residential area, which is susceptible to noise and odour complaints. The facility has received significant improvements over the past several years, including the addition of a leachate/septic receiving facility during 2005. Also, during this upgrade, the headworks was upgraded with the addition of a fine screen and auger system, the mechanical aeration was replaced with fine air diffusers/blowers, and the chlorine disinfection system was replaced with a UV disinfection system. Past upgrades include the Bighead Pumping station (#1) replacement in 1991, the #3 Station (highway 26 West) was replaced in 1994, and in 1996 the additional biosolids storage facility was completed. In 2014, the existing generator at the main plant was replaced with a new 120kW generator.

- Capacity: 3,910 m3/day
- Classification: Class 3 Wastewater Collection, Class 2 Wastewater Plant
- Service Area: Municipality of Meaford
- Service Population: 4,749
- In Service Date: 1970
- Effluent Receiver: Georgian Bay
- Major Plant Processes: High-Rate Process with Continuous Effluent Discharge
  Continuous Ultraviolet Disinfection (new in 2005)
  No Phosphorus Removal
  Aerobic Digestion with agricultural land disposal of biosolids

Sampling Procedures

Table 2: Raw Sewage Monitoring

Parameters	Sample Type	Frequency
CBOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly
Ammonia Nitrogen	Composite	Monthly
Nitrite + Nitrate Nitrogen	Composite	Monthly
Alkalinity, pH	Composite	Monthly

Table 3: Effluent Monitoring

Parameters	Sample Type	Frequency
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
Total Kjeldahl Nitrogen	Composite	Weekly
Ammonia Nitrogen	Composite	Weekly
Nitrite + Nitrate Nitrogen	Composite	Weekly
pH	Grab	Weekly
Escherichia Coli	Grab	Weekly
Temperature	Grab	Weekly

Aerobic sludge is collected and tested as per the sampling requirements found in Schedule D in ECA #9036-AZFPV6

All chemical and bacteriological sample analyses are conducted by an accredited lab, SGS Lakefield Research Ltd.

Flows

The total flow treated in 2025 was 879,963 m3, this is up 144,467 m3 from 2024. The 2025 annual average daily flow was 2,418 m3 per day, operating at approximately 62% of the design capacity. The Maximum peak daily flow of 165 L/s occurred in March & April 2025 which was caused by heavy rain and snow melt.

Table 4: 2024 and 2025 Daily Flow Data

	Average Day 2025 m3	Average Day 2024 m3	Peak Day 2025 L/s	Peak Day 2024 L/s	Total Month 2025 m3	Total Month 2024 m3
January	2,575	2,445	116	102	79,830	75,793
February	1,983	2,343	93	112	51,545	67,943
March	5,525	2,117	165	130	171,267	65,642
April	4,340	3,079	165	136	130,208	92,370
May	2,394	2,001	152	154	74,220	62,023
June	2,127	1,554	138	126	63,804	46,628
July	1,878	1,727	115	134	58,221	53,542
August	1,580	1,578	108	124	48,974	48,933
September	1,472	1,478	116	98	44,154	44,343
October	1,389	1,422	106	109	43,053	42,667
November	1,723	1,526	112	114	51,692	45,772
December	2,032	2,898	165	165	62,995	89,840
				Totals	879,963	735,496

Plant Performance & Effluent Quality

There were no operating problems encountered or corrective actions required at the Meaford Wastewater Treatment Plant.

Detailed (daily) analytical data is available at the Meaford WWTP administrative office. The annual and monthly averages and loadings are summarized below.

Although the Meaford WWTP is designed as a High Rate Activated Sludge Plant, it continues to perform well, being operated as an activated sludge plant. During 2025, the Total Phosphorus was above the Monthly Average Concentration Objective from July to November inclusive and over the Monthly Average Concentration Limit for September due to the fact there is no Phosphorus removal in the plant (MECP was notified), as well the Final Effluent E.coli Monthly Geometric Mean Density Objective was exceeded in May, all other annual loading limits and monthly average concentration limits were met as per the ECA.

All lab analysis for the Meaford WWTP were tested by an accredited lab, SGS Lakefield, and collected as per Guidelines set by the Ministry of Environment, Conservation and Parks.

Table 5: Treatment Efficiency and Loading Limits

	Annual Average Raw	Annual Average Effluent	Annual Average Loading Limits	Efficiency %
CBOD	111.58	4.65	11.19	95.8
T.S.S	101.67	8.53	20.52	91.6
Total Phosphorus	2.48	2.26	5.43	9.1
Ammonia Nitrogen	20.87	0.85		95.9
Loading Limits	CBOD Monthly Average Effluent Loading Limit (Limit 78.2kg/d)	TSS Monthly Average Effluent Loading Limit (Limit 78.2kg/d)	Total Phosphorus Monthly Average Effluent Loading Limit (Limit 15.6kg/d)	Total Ammonia Nitrogen Monthly Average Effluent (Oct 1 - May 14 Limit 19.6kg/d) (May 15 - Sep 30 Limit 11.7kg/d)
January	10.943	14.806	3.186	2.511
February	10.124	19.787	2.664	2.025
March	22.097	16.572	5.966	9.529
April	18.227	27.775	3.420	9.721
May	12.568	19.750	3.561	1.077
June	8.506	13.610	4.177	0.553
July	8.920	13.145	5.451	0.469
August	7.108	15.796	5.402	0.987
September	7.947	15.894	8.391	0.736
October	5.902	15.275	4.267	0.347
November	7.753	22.397	3.549	1.034
December	10.566	20.319	3.877	2.520

Final Effluent Objectives and Limits

The Final Effluent from the Facility did not meet the Monthly Average Concentration Objective for Total Phosphorus from July to November inclusive 2025 and did not meet the Monthly Average Concentration Limit for September due to the fact there is no Phosphorus removal in the plant (MECP was notified). The Final Effluent E.coli Monthly Geometric Mean Density Objective was not met in May.

By-passing, Overflow and Abnormal Conditions

There were no bypass events at the Meaford WWTP during 2025.
There were 3 instances of overflow conditions as defined in the Wastewater Plant ECA Number

9036-AZFPV6 during 2025 at the WWTP, summarized in the table below.

EVENT # (YYYY-##)	LOCATION	RECEIVING WATER	VOLUME (m3)	APPROX. START	APPROX. END	DURATION (HRS)
2025-01	WWTP	Georgian Bay	12,717	Mar 15 @ 15:24	Mar 17 @ 09:30	42hrs 6min
2025-02	WWTP	Georgian Bay	8, 228	Mar 29 @ 18:46	Mar 31 @ 04:45	33hrs 59min
2025-03	WWTP	Georgian Bay	10,804	Apr 2 @ 23:13	Apr 4 @ 06:55	31hrs 42 min

Maintenance and Calibration Activities

Plant maintenance, including non-scheduled maintenance, is monitored using a manual workorder system. Completed maintenance reports are available onsite. All routine and preventative maintenance was conducted as scheduled in 2025. All three (3) standby generators were tested monthly.

Repairs or improvements to equipment on the works were made or identified in 2025 as follows:

- Aeration Tank #1 Sand and Grit Cleaned Out, all fine bubble diffusers replaced.

Septage Receiving Works

The Meaford WWTP continued to only accept septage from within its Municipal Boundaries as previously agreed by council. In 2025, Meaford WWTP treated approximately 106,985 gallons (405m3) of septage/holding tank waste.

Table 6: Septage

Month	Portables Loads	Portables Gallons	Holding Tank Loads	Holding Tank Gallons	Septic Loads	Septic Gallons	Total Gallons
January	20	3,365			2	2,100	5,465
February	15	2,415	2	5,800			8,215
March	11	2,245	1	2,300	9	9,100	13,645
April	21	4,005	1	2,700	12	9,700	16,405
May	21	3,595					3,595
June	33	6,565					6,565
July	27	5,955					5,955
August	20	4,565					4,565
September	21	5,125			4	5,100	10,225
October	26	6,690			3	3,500	10,190
November	23	4,555	1	1,600	4	3,800	9,955
December	18	3,205	1	2,600	4	6,400	12,205
					Overall	**Total**	**106,985**

Biosolids Facility

Digested sludge produced at the Meaford WWTP was land-applied in accordance with the Nutrient Management Act 2002 and Ontario Regulation 267/03.

Grab samples of digested (aerobic) sludge are collected as the sludge truck is being filled. In 2025 sludge sample analyses were carried out by SGS Lakefield Research Limited.

Region of Huronia Environmental Services Ltd (ROHES) was contracted to haul and spread sludge from the Meaford plant in 2025. A total volume of 1,885m3 of sludge was hauled in 2025.

Estimated allowable hauled sludge amounts are approximately 2,600 m3

The plant is achieving greater storage capacity than the 6-month storage capacity that is presently required by the Ministry of Environment, Conservation and Parks.

Monthly Haulage volumes from the plant were as follows:

Month	**Cubic Metres**	**Month**	**Cubic Metres**
January	0	July	0
February	0	August	0
March	0	September	0
April	0	October	787
May	0	November	0
June	1098	December	0

Inspections
There were no regulatory inspections during the 2025 review period.

Alarm Response
The Environmental Services staff responded without interruption or loss of service to all plant and pumping station alarms.

Complaint Summary
One odour complaint was received during this reporting period for the Meaford Wastewater Treatment Plant. The cause was identified as the temporary shutdown of the storage tank air diffusers, which was required to carry out operational tasks aimed at reducing the liquid volume and thickening the sludge prior to hauling.

Operational Objectives
The Meaford Water Pollution Control Plant continues to provide excellent wastewater treatment. Meaford and its operators will continue to strive through expertise and knowledge to meet all objectives and to continually improve and optimize the efficiency of the facility.

Discussion
The following are tables summarizing the results received for the period of January 2025 to December 2025 for the following parameters, with the maximum concentrations of the effluent parameters as outlined in the Terms and Conditions for ECA 9036-AZFPV6.

2025 Sewage Lab Results Monthly Averages

Month	Raw	Parameters	Effluent Sample Sets					Monthly Average Concentration	Monthly Average Concentration Objective	Monthly Average Concentration Limits	MIN	MAX	Monthly Geometric Mean Design Concentration Objective	Monthly Geometric Mean
			1	2	3	4	5							
January	68	CBOD5	4	5	4	4		4.3	15.0	20.0mg/L	4	5		
	44	T.S.S	4	6	7	6		5.8	15.0	20mg/L	4	7		
	1.71	Total Phosphorus	0.82	1.21	1.3	1.62		1.24	2.0	4mg/L	0.82	1.62		
	14.1	T.A.N-Freezing	1.1	0.7	0.9	1.2		1.0	3.0	Freezing Period-5mg/l	0.7	1.2		
		E-Coli	30	7	7	8		13.0	N/A	200 cfu/100mL	7	30	100 cfu/100mL	10.4
	17.3	TKN	2	1.7	1.5	2.1		1.8			1.5	2.1		
	7.57	pH	7.39	7.45	7.34	7.18		7.3	pH maintained between 6-9.5		7.18	7.45		
February	213	CBOD5	4	5	9	4		5.5	15.0	20.0mg/l	4	9		
	134	T.S.S	4	5	28	6		10.8	15.0	20mg/l	4	28		
	2.47	Total Phosphorus	1.72	1.13	1.57	1.37		1.45	2.0	4mg/l	1.13	1.72		
	18.6	T.A.N-Freezing	0.9	0.7	1.6	1.2		1.1	3.0	Freezing Period-5 mg/l	0.7	1.6		
		E-Coli	0.01	88	59	210		89.3	N/A	200 cfu/100mL	0.01	210	100 cfu/100mL	10.2
	22	TKN	1.6	1.4	2.4	2.2		1.9			1.4	2.4		
	7.36	pH	7.23	7.18	7.2	7.58		7.3	pH maintained between 6-9.5		7.18	7.58		
March	48	CBOD5	4	4	4	4		4.0	15.0	20.0mg/l	4	4		
	78	T.S.S	2	3	4	3		3.0	15.0	20mg/l	2	4		
	1.46	Total Phosphorus	0.6	2.92	0.27	0.53		1.08	2.0	4mg/l	0.27	2.92		
	14.3	T.A.N-Freezing	1.5	1.8	1.4	2.2		1.7	3.0	Freezing Period-5 mg/l	1.4	2.2		
		E-Coli	3	411	79	2		123.8	N/A	200 cfu/100mL	2	411	100 cfu/100mL	21.0
	16.5	TKN	1.5	1.7	2.1	2.6		2.0			1.5	2.6		
	7.65	pH	7.29	8.07	7.55	7.42		7.6	pH maintained between 6-9.5		7.29	8.07		

2025 Sewage Lab Results Monthly Averages

Month	Raw	Parameters	Effluent Sample Sets					Monthly Average Concentration	Monthly Average Concentration Objective	Monthly Average Concentration Limits	MIN	MAX	Monthly Geometric Mean Design Concentration Objective	Monthly Geometric Mean
			1	2	3	4	5							
April	38	CBOD5	4	4	4	5	4	4.2	15.0	20.0mg/l	4	5		
	14	T.S.S	4	6	6	9	7	6.4	15.0	20mg/l	4	9		
	0.64	Total Phosphorus	0.35	0.37	2.18	0.48	0.56	0.79	2.0	4mg/l	0.35	2.18		
	6.1	T.A.N-Freezing	1.6	2.4	5.4	1.2	0.6	2.2	3.0	Freezing Period-5mg/l	0.6	5.4		
		E-Coli	27	10	28	26	4	19.0	N/A	200 cfu/100mL	4	28	100 cfu/100mL	15.1
	7.6	TKN	2.3	2.5	6.7	1.8	1	2.9			1	6.7		
	7.83	pH	7.65	7.49	7.26	7.28	7.49	7.4	pH maintained between 6-9.5		7.26	7.65		
May	99	CBOD5	4	6	7	4		5.3	15.0	20.0mg/l	4	7		
	110	T.S.S	6	7	11	9		8.3	15.0	20mg/l	6	11		
	1.62	Total Phosphorus	1.3	1.44	2.02	1.19		1.49	2.0	4mg/l	1.19	2.02		
	11.7	T.A.N-Freezing Oct 1- May 14 NON-Freezing May 15-Sep 30	0.4	0.4	0.7	0.3		0.5	3.0	Freezing Period-5mg/L Non-Freezing Period- 3 mg/L	0.3	0.7		
		E-Coli	4	236	137	2420		699.3	N/A	200 cfu/100mL	4	2420	100 cfu/100mL	133.0
	15.4	TKN	1.4	1	1.6	0.9		1.2			0.9	1.6		
	7.47	pH	7.23	7.86	7.16	7.23		7.4	pH maintained between 6-9.5		7.16	7.86		
June	98	CBOD5	4	4	4	4	4	4.0	15.0	20.0mg/l	4	4		
	34	T.S.S	5	4	9	9	5	6.4	15.0	20mg/l	4	9		
	1.96	Total Phosphorus	1.65	2.07	2.42	1.57	2.11	1.96	2.0	4mg/l	1.57	2.42		
	18.4	T.A.N-NON-Freezing	0.5	0.2	0.1	0.4	0.1	0.3	3.0	Non-Freezing Period- 3 mg/l	0.1	0.5		
		E-Coli	43	2	1	1	28	15.0	N/A	200 cfu/100mL	1	43	100 cfu/100mL	4.7
	25.2	TKN	1.2	0.8	0.8	1.2	0.8	1.0			0.8	1.2		
	7.53	pH	7.25	7.84	7.51	7.31	7.87	7.6	pH maintained between 6-9.5		7.25	7.87		

3rd sample in April - high Ammonia due to Supernating

2025 Sewage Lab Results Monthly Averages

Month	Raw	Parameters	Effluent Sample Sets						Monthly Average Concentration	Monthly Average Concentration Objective	Monthly Average Concentration Limits	MIN	MAX	Monthly Geometric Mean Design Concentration Objective	Monthly Geometric Mean
			1	2	3	4	5	6							
July	103	CBOD5	4	4	4	7			4.8	15.0	20.0mg/l	4	7		
	109	T.S.S	5	8	4	11			7.0	15.0	20mg/l	4	11		
	2.64	Total Phosphorus	2.47	2.78	2.78	3.58			2.90	2.0	4mg/l	2.47	3.58		
	22.3	T.A.N-NON-Freezing	0.1	0.4	0.2	0.3			0.25	3.0	Non-Freezing Period-3mg/l	0.1	0.4		
		E-Coli	1	1	10	5			4.3	N/A	200 cfu/100mL	1	10	100 cfu/100mL	2.7
	23.2	TKN	1.6	1	0.6	1.1			1.08			0.6	1.6		
	7.45	pH	7.11	7.04	7.08	6.92			7.0	pH maintained between 6-9.5		6.92	7.11		
August	157	CBOD5	6	4	4	4			4.5	15.0	20.0mg/l	4	6		
	152	T.S.S	18	11	6	5			10.0	15.0	20mg/l	5	18		
	4.46	Total Phosphorus	3.45	3.87	3.56	2.8			3.42	2.0	4mg/l	2.8	3.87		
	31	T.A.N- NON-Freezing	0.9	0.5	0.2	0.9			0.63	3.0	Non-Freezing Period-3 mg/l	0.2	0.9		
		E-Coli	41	15	3	2			15.3	N/A	200 cfu/100mL	2	41	100 cfu/100mL	7.8
	34.2	TKN	4	2.4	0.5	1			1.98			0.5	4		
	7.34	pH	6.89	6.95	6.92	7.11			7.0	pH maintained between 6-9.5		6.89	7.11		
September	211	CBOD5	8	5	4	4		6	5.4	15.0	20.0mg/l	4	8		
	346	T.S.S	12	13	11	8		10	10.8	15.0	20mg/l	8	13		
	3.6	Total Phosphorus	3.18	3.73	9.68	2.69	11.4	3.53	5.70	2.0	4mg/l	2.69	11.4		
	29.1	T.A.N-NON-Freezing	0.7	0.5	1	0.1		0.2	0.50	3.0	Non-Freezing Period-3 mg/l	0.1	1		
		E-Coli	5	2	24	8		0.01	7.8	N/A	200 cfu/100mL	0.01	24	100 cfu/100mL	1.8
	32.9	TKN	2.4	1.4	1.1	1.9		0.5	1.46			0.5	2.4		
	7.39	pH	7.03	7.04	6.81	7		6.99	7.0	pH maintained between 6-9.5		6.81	7.04		

2025 Sewage Lab Results Monthly Averages

Month	Raw	Parameters	Effluent Sample Sets					Monthly Average Concentration	Monthly Average Concentration Objective	Monthly Average Concentration Limits	MIN	MAX	Monthly Geometric Mean Design Concentration Objective	Monthly Geometric Mean
			1	2	3	4	5							
October	148	CBOD5	4	5	4	4		4.3	15.0	20.0mg/l	4	5		
	115	T.S.S	14	22	4	4		11.0	15.0	20mg/l	4	22		
	3.96	Total Phosphorus	3.66	3.36	2.54	2.73		3.07	2.0	4mg/l	2.54	3.66		
	37.3	T.A.N- Freezing	0.2	0.4	0.2	0.2		0.25	3.0	Freezing Period-5mg/L	0.2	0.4		
		E-Coli	18	13	14	260		76.3	N/A	200 cfu/100mL	13	260	100 cfu/100mL	30.4
	41	TKN	0.9	1.7	1.1	1.3		1.25			0.9	1.7		
	7.76	pH	6.88	6.91	7.01	6.94		6.9	pH maintained between 6-9.5		6.88	7.01		
November	83	CBOD5	6	4	4	4		4.5	15.0	20.0mg/l	4	6		
	56	T.S.S	19	13	11	9		13.0	15.0	20mg/l	9	19		
	2.88	Total Phosphorus	1.92	2.37	1.83	2.12		2.06	2.0	4mg/l	1.83	2.37		
	25.6	T.A.N- Freezing	0.2	1.9	0.1	0.2		0.60	3.0	Freezing Period-5mg/l	0.1	1.9		
		E-Coli	549	10	115	1		168.8	N/A	200 cfu/100mL	1	549	100 cfu/100mL	28.2
	27.7	TKN	1.6	2.4	0.6	2.7		1.83			0.6	2.7		
	7.71	pH	6.89	6.97	7.05	6.9		7.0	pH maintained between 6-9.5		6.89	7.05		
December	73	CBOD5	5	7	4	4	6	5.2	15.0	20.0mg/l	4	7		
	28	T.S.S	10	11	10	9	10	10.0	15.0	20mg/l	9	11		
	2.38	Total Phosphorus	1.95	2.45	2.42	1.08	1.64	1.91	2.0	4mg/l	1.08	2.45		
	21.9	T.A.N-Freezing	0.5	2	3	0.2	0.5	1.24	3.0	Freezing Period-5mg/l	0.2	3		
		E-Coli	0.01	6	0.2	8	18	6.4	N/A	200 cfu/100mL	0.01	18	100 cfu/100mL	1.1
	24.3	TKN	1.5	2.8	1.8	1	1.8	1.78			1	2.8		
	7.63	pH	7.91	6.98	6.94	7.61	7.09	7.3	pH maintained between 6-9.5		6.94	7.91		