



CANTON
d'ARMSTRONG
TOWNSHIP
EARLTON

Village of Earlington Sewage System
Annual & Performance REPORT
FOR THE YEAR
2024

MOE ECA, NUMBER 1369-ALYHHP

COUNCIL MEMBERS SIGNATURES

MAYOR:

Jean Marc Boileau

COUNCILOR:

Donald P. J.

COUNCILOR:

R. N.

COUNCILOR:

Michelle B. Ward

COUNCILOR:



CANTON
d'ARMSTRONG
TOWNSHIP
EARLTON

Earlton Sewage System

January 07, 2025

ECA NUMBER 1369-ALYHHP

Annual & Performance Report

System Type; The system consists of three lagoon cells, (three [3] facultative lagoons {Cells #2 and 3} each with a SWD of 1.8 m and a freeboard of 0.6 m, having working volumes of 47,220 cub. m, and area of 3.38 ha. and one [1] {Cell #1} having working volumes of 47,620 cub. m, and area of 3.80 ha. respectively.) It also has one [1] aeration Cell 73 m by 58 m (top of berm) with a SWD of 2.85 m and a freeboard of 0.6 m having a working volume of 5,415 cubic meter, equipped with an air diffusion grid system, it is operated as a seasonal discharge system to coincide with higher receiving stream flows and create less of an impact on the environment. Allowable discharge periods on the ECA are April 01 to May 31, and September 15 to November 31 of each year, however, these entire periods are not necessarily required for discharge. The ECA for the system, limits the raw sewage flow into the lagoon to 743 m³/day (calculated on an average annual basis) and the

flow out of the lagoon to a maximum of 3,024 m³/day (35 L/s) during the discharge period.

We are introducing Alum Sulphate to the raw sewage coming in to the lagoon cells at a rate of .22 L/min, or per 4.5 m³ (approx.).

Pump Station is equipped with a generator back up, which is manually operated and tested to run the plant every week as part of a maintenance program. Pumps consist of two electric 30 HP, belt driven centrifugal pumps, pumping at a rated capacity of 80 to 85 L/sec. at a TDH of 15.0 meters. Pump automatically alternate at each start up. The pump station status is being checked daily (weekends and Holidays also). Periodically, as part of regular maintenance, (every 3 months) the raw sewage screening basket is inspected and debris is removed as required. Once every six months, an inspection in the wet well area is done and the control floats and the sample injection line are cleaned and inspected. Flow records and time pump runs are being checked daily and logged at the plant, and compared with the ones that come in on the SCADA system, at the office for accuracy references.

Raw Sewage sampling is done monthly, usually done mid-month; sampling location is at the pumping station, using a 24-hour programmable composite sampler. Parameter for raw sewage is CBOD₅, Total Suspended Solids, Total Phosphorous, and Total Kjeldahl Nitrogen. Sample data results can be viewed at the Water/Wastewater office, and page 8 of this Report.

Effluent Monitoring sampling normally consist of 4 grab samples prior to seasonal discharge, to be analyze for Hydrogen Sulphide and E-coli, CBOD5, Total Suspended Solids, Total Phosphorous, and Total Ammonia Nitrogen (Ammonia plus Ammonium). One sample is then taken at the start of the discharge process, then at 25%, 50%, 75%, and at the End of the discharge process. Samples are analyzed for CBOD5, Total Suspended Solids, Total Phosphorous, and Total Ammonia Nitrogen (Ammonia plus Ammonium), Hydrogen Sulphide, Un-ionized Ammonia and PH at 15°. Also pH and Temperature in the field at the time of sampling. Total amount of flow going out to the environment is to be monitored and logged at the time of each sampling.

Sample data result copies for the year 2024 can be viewed at the Water/Wastewater Office.

Post-Aeration System consist of an earthen cell with a working volume of 5415 m³, a small blower building, housing three positive displacement blowers, each rated to deliver 4.25 m³/min of air at 97.88 kPa absolute pressure; and piping and diffusers to deliver air into the effluent as it passes through the cell.

It is not intended that the post-aeration cell be used for storage, but rather, for retention time during discharge and, therefore, it should not be drained down except for maintenance purposes.

The aeration cell's sole purpose is to strip Hydrogen Sulphide (H₂S) prior to effluent discharge. Hydrogen Sulphide builds up under a lagoon's ice cover during the winter and is toxic to aquatic life, even at low concentrations, and, therefore, must be removed prior to discharge.

Flow meters are calibrated yearly and Alum Sulphate chemical pump flows are calibrated and logged monthly. The duty on the Alum sulphate pumps rotates after each start and Tank levels and pump percentages are logged daily in rounds sheets. Manhole near Alum building, where Alum sulphate is being injected, is being checked monthly to make sure it is working properly and not leaking.

The collection system is entirely flushed in three separate steps, in a three-year period. The entire collection system has been videoed by Ray Lachapelle (Private eye). Records of the sewer main section that has been flushed this year is kept in with the maintenance book records. Manholes are being inspected for structural damage in the summer months, and upgrade as needed.

**Note: Last Flushing + CCTV done October 7 & 8, 2024
On some of the most problematic lines.**

The collection system is a CLASS 2 System and requires Operators to write a Class 2 collection certification exam. Currently there are 3 operators who hold a Class 2 Collection and 1 Operator holds a Class 2 Treatment facility license.



2024 Spring Discharge Results

Total Discharge 149544 m³

- **Total Spring Discharge: 149544 m³**
- **Flow Duration was 1236 hours = 51.5 days**
- **Average Flow was 33.61 l/sec. = 2903.90 m³/day**

Loading = $\frac{\text{Flow (m}^3\text{/day)} \times \text{concentration (mg/l)}}{1000} = \text{kg/day}$

CBOD5 =16.49 kg/day

Total Suspended Solids = 52.27 kg/day

Total Phosphorous = 1.06 kg/day

Total Ammonia Nitrogen = 0.72 kg/day

One sample at the 50% mark indicated a small amount Of H₂S and was reported to proper authorities.

Over the summer cleaning of vegetation around all cells plus aeration cell was done with a contracted excavator. Aeration cell was also brought down to inspect blower pipe system. All in perfect condition.

2024 Fall Discharge Results

Total Fall Discharge 104214 m³

Flow Duration was 1536 hours. = 64 Days

Average Flow Rate was 18.84 l/sec. = 1628.34 m³/day

Loading = $\frac{\text{Flow (m³/day) x concentration (mg/l)}{1000} = \text{kg/day}$

CBOD5 =1.73 kg/day

Total Suspended Solids = 6.35 kg/day

Total Phosphorous = 0.65 kg/day

Total Ammonia Nitrogen = 0.81 kg/day

All Fall Samples were well below the Effluent Design Objectives, including H₂S.

2024 Monthly Raw Sewage

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec		
cBOD5 mg/l	430	280	21	16	34	52	51	200	51	62.9	50	78.4	1326.3	110.525
Total Phosphorous mg/l	14.1	4.63	2.09	0.433	1.4	3.39	1.51	2.85	1.21	1.63	0.651	3.53	37.424	3.118667
TSS mg/l	1100	237	24	20	47.5	184	36	79	48	73.5	34.5	168	2051.5	170.9583
Total Kjeldahl Nitrogen (TKN)	95.2	44.7	18.6	6.5	11.6	26.5	19.4	29.6	15.6	18.7	13.3	27	326.7	27.225
													Total	Average

Influent Samples taken from Raw sewage remains consistent to expected results as per recent years

Description of Design Objectives of ECA, NUMBER 1369-ALYHHP

DESIGN OBJECTIVES

1. The Owner shall design and operate the Sewage Treatment Plant in accordance with the following objectives:

- a. Final Effluent parameters design objectives listed in the table(s) included in Schedule B;
- b. Final Effluent is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discoloration on the receiving waters.
- c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.

2. The Owner shall make an assessment of the issues and recommendations for pro-active actions if any is required under the following situations and include in the annual report to the Water Supervisor:

- a. when any of the design objectives is not achieved more than 50% of the time in a year;
- b. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity.

Schedule B

Final Effluent Design Objectives

Concentration Objectives

Final Effluent Parameter	Averaging Calculator	Objective (milligrams per litre unless otherwise indicated)
CBOD5	Seasonal Average Effluent Concentration	15.0 mg/L
Total Suspended Solids	Seasonal Average Effluent Concentration	15.0 mg/L
Total Phosphorus	Seasonal Average Effluent Concentration	0.5 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	10.0 mg/L (Apr 1 - Apr 30) 5.0 mg/L (May 1 - May 31) 5.0 mg/L (Sep 1 - Nov 30)
pH	Single Sample Result	6.5 - 8.5 inclusive
Hydrogen Sulphide	Single Sample Result	Non-detectable

1-Design Objectives of Final Effluent was exceeded for H2S on 2 occasions in the spring.

2- Design Objective for Average TSS for fall effluent was exceeded.

The spring and fall discharge, prior to discharge samples include sampling at all four (4) lagoons as per request from Ministry

The following tables show the spring and fall Effluent results.

2024 Spring effluent discharge										C of A	C of A
	Prior	Start	25%	50%	75%	End	mg/l	mg/l	KG/Day		
cBOD5 mg/l	5.2	7.1	18	1	1	1.3	28.4	5.68	16.49	<30 mg/l	91.0 kg/d
Total Phosphorous mg/l	0.148	0.121	0.541	0.289	0.375	0.494	1.82	0.364	1.06	1.0 mg/l	3.02 kg/d
TSS mg/l	10.5	14	19	55	1	1	90	18	52.27	<30 mg/l	91.0 kg/d
Total Ammonia mg/l	0.05	0.14	0.82	0.13	0.12	0.03	1.24	0.248	0.72	10 mg/l	30.2 kg/d
							Total	Average	Average	accepted/average	accepted/average
WSER. Spring 2023	Every 2 Weeks										
pH (15 deg. C)		8.22	7.94	8.28	7.89	8.21					
Un-Ionized Ammonia	<0.002	0.006	0.019	0.007	0.003	<0.002					
Hydrogen Sulphide	<0.02	<0.02	0.02	0.03	<0.02	<0.02					

Note:

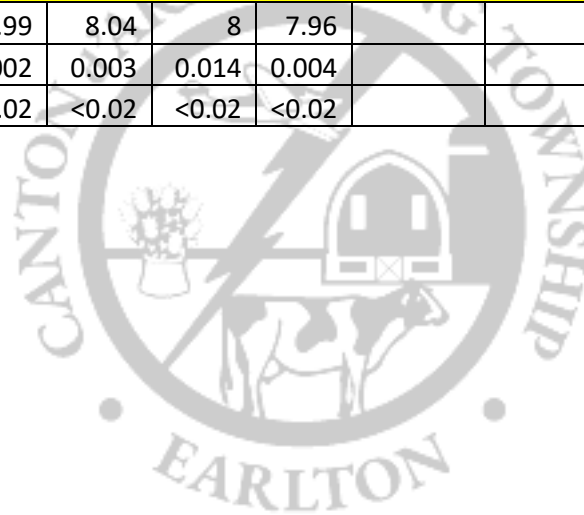
Due to H2S exceedances during Spring Discharge the Township had to report to Spills Action Centre and investigate the causes to ensure that the post-aeration system is being operated and maintained to achieve compliance with the Environmental Compliance Approval.

The cleaning of the sample area of some weeds was done after final discharge as a control measure with more cleaning around lagoon cells that were done in the summer of 2024.

Fall discharge period had NO H2S exceedance.

2024 Fall effluent discharge										C of A	C of A
	Prior	Start	25%	50%	75%	End	mg/l	mg/l	KG/Day		
cBOD5 mg/l	1.9	1	0.9	1.3	1.2	0.9	5.3	1.06	1.73	<30 mg/l	91.0 kg/d
Total Phosphorous mg/l	0.992	1.06	0.295	0.214	0.215	0.208	1.992	0.3984	0.65	1.0 mg/l	3.02 kg/d
TSS mg/l	<1	1	4	6.5	7	1	19.5	3.9	6.35	<30 mg/l	91.0 kg/d
Total Ammonia mg/l	0.11	0.13	0.07	0.11	1.38	0.79	2.48	0.496	0.81	10 mg/l	30.2 kg/d
							Total	Average	Average	accepted/average	accepted/average

WSER. Fall 2023	Every 2 Weeks								
pH (15 deg. C)		7.86	7.99	8.04	8	7.96			
Un-Ionized Ammonia	<0.002	<0.002	<0.002	0.003	0.014	0.004			
Hydrogen Sulphide	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			



6-year averages show that the results from testing are consistent and within accepted average and that they are meeting the design objectives in many of the parameters.

Annual Spring effluent discharge										C of A	C of A
	2019	2020	2021	2022	2023	2024	mg/l	mg/l	KG/Day	accepted/average	Design objectives
cBOD5 mg/l	5.5	3.52	4.4	5.28	4.72	5.68	29.132	4.855333	12.054	<30 mg/l	15.0 mg/l
Total Phosphorous mg/l	0.41	0.267	0.2012	0.4238	0.3272	0.364	1.9932	0.3322	0.846	1.0 mg/l	0.5 mg/l
TSS mg/l	9.2	19	7.2	8.9	7.84	18	70.14	11.69	26.642	<30 mg/l	15.0 mg/l
Total Ammonia mg/l	3.75	1.154	0.1375	1.82	1.548	0.248	8.6575	1.442917	4.455	10 mg/l	10mg/l 5.0 mg/l
							Total	Average	Average		
WSER. Spring 2023											
pH (15 deg. C)	8.05	8.16	7.86	7.81	8.04	8.108				6.5-8.5	
Un-Ionized Ammonia	0.082	0.0172	0.0025	0.0355	0.035	0.0074					
Hydrogen Sulphide	<0.02	<0.02	<0.02	0.02	0.02	0.022				Non-detectable	

Annual Fall effluent discharge										C of A	C of A
	2019	2020	2021	2022	2023	2024	mg/l	mg/l	KG/Day	accepted/average	Design objectives
cBOD5 mg/l	1.6	2.14	2.72	1.3	1.74	1.06	10.54	1.756667	4.546	<30 mg/l	15.0 mg/l
Total Phosphorous mg/l	0.13	0.447	0.4702	0.5814	0.29	0.3984	2.317	0.386167	0.918	1.0 mg/l	0.5 mg/l
TSS mg/l	1.87	10.9	6.6	9.5	57.2	3.9	89.97	14.995	44.184	<30 mg/l	15.0 mg/l
Total Ammonia mg/l	0.47	1.042	0.604	3.47	1.372	0.496	7.454	1.242333	3.66	10 mg/l	10mg/l 5.0 mg/l
							Total	Average	Average		
WSER. Spring 2023											
pH (15 deg. C)	8.11	7.27	7.66	7.84	7.64	7.97				6.5-8.5	
Un-Ionized Ammonia	0.004	0.008	0.0062	0.06525	0.02275	0.005					
Hydrogen Sulphide	<0.02	<0.02	0.02	0.02	<0.02	<0.02				Non-detectable	

In Conclusion the Lagoons and treatment process are performing well and are normal to above normal for some aspects Except for recent issues with H2S.

2- Design objectives for Annual Average Daily Influent Flow being below 80% of the Rated Capacity:

As per previous years the Township of Armstrong has been repairing the collection system to restrict the infiltration of rain and snow melt in and around manholes and letters have been sent to residents on how to minimize the flow of water from their properties.

There is a negative effect on Influent Flow during the spring thaw in 2024 and also after major rain events throughout the year which affects the annual average considerably.

The following is the Table of Annual Influent Flow.

2024 Raw sewage flow Monitoring (cub.meters)

	Total	Average	Maximum	Total allow.	Over	%
Jan.	9834	317	434	23033	-13199	42.69%
Feb.	10898	376	1489	21547	-10649	50.62%
Mar.	24827	801	1741	23033	1794	107.79%
April	41845	1395	7164	22290	19555	187.73%
May	19423	627	1628	23033	-3610	84.33%
June	16356	545	1804	22290	-5934	73.38%
July	12587	406	814	23033	-10446	54.65%
Aug.	10884	351	1666	23033	-12149	47.25%
Sept.	17517	583.9	2012	22290	-4773	78.59%
Oct.	17588	567	2005	23033	-5445	76.36%
Nov.	24247	808	2241	22290	1957	108.78%
Dec.	17709	571	2136	23033	-5324	76.89%
Total	223715			271195	-47480	
Average	18642.92	612.33	2094.50			82.42%
Maximum	41845	1395	7164			
Minimum	9834	317	434			

2024 Monthly Raw sewage flow Monitoring

Annual average; 2011----- 94% of rated capacity
2012-----83% of rated capacity
2013-----91% of rated capacity
2014-----102% of rated capacity
2015-----87% of rated capacity
2016-----86% of rated capacity
2017-----92% of rated capacity
2018-----74.41% of rated capacity
2019-----91.91% of rated capacity
2020-----81.47% of rated capacity
2021-----76.36% of rated capacity
2022-----79.05% of rated capacity
2023-----83.40% of rated capacity
2024-----82.42% of rated capacity

Operating Issues:

The Annual average which is a concern is being monitored by Operators and repairs to manhole infiltration has been ongoing since 2013 with more effort on Public education on best practices in 2024. Results show a slightly lower % for the year 2024. No major breaks or repairs had to be done in 2024.

The Maintenance and inspection of equipment & structure is covered in the description of the system on pages 2, 3, 4 and 5 of this Report.

All Manholes were inspected in 2024 and some issues will be addressed in the next years.

The Hydraulic Reserve Capacity of the Earlton Wastewater treatment has been calculated in accordance with Ministry of Environment guidelines. And was completed by JL Richards and Associates Limited

(Please see Attached documents)

Sludge:

A plan has been developed and the sludge was measured and recorded for all three Lagoons in 2016. Results showed very little accumulation in lagoons #2 & #3 and lagoon #1 however, which is the oldest lagoon had a little more sludge but was not a concern at this time.

2024 results showed no increase from previous year.

Sludge accumulations are not a concern according to results from 2024.

Cell #1 Average Sludge = 7.5”

Cell #2 Average Sludge = 4.375”

Cell #3 Average Sludge = 3.75”

Complaints:

There have been no complaints in 2024. Operators were called on a few occasions to investigate sewer backup in some residences but all problems were the responsibility of the homeowners as the issues were all found to be on their properties. We however supplied residents with parts and directions, when necessary, as per their requests.

Modifications:

No modifications were done in 2024. As previously stated, pages 2,3,4 and 5 of this report cover maintenance schedule for the works. Maintenance follows the schedule kept in Wastewater office and is only performed by trained and competent Operators.

Bypasses, Overflows, Spills:

As per the C of A, a record of any Bypasses, Overflows or Spills within the meaning of part X of EPA are logged and reported to the MECSP Spill Action Centre. A log book is kept indicating the time, duration, quantity of bypass and/or other and reason for occurrence.

There was no Bypass, Overflow Or Spills within the meaning of part X of EPA and no abnormal discharge events or abnormal operating conditions for the sewage system in 2024.

Calibrations:

Calibrations of Flow meters and Auto Sampler were done in August 2024 by qualified operators and were showed to be in manufacturer’s specifications.

Other considerations:

The Township of Armstrong is committed to have Certified Operators and provide the necessary training through courses and on-the-job training while performing inspections and maintenance.

Performance Report Prepared by:

Guy Laurin

Tel: 705-563-2375

Fax: 705-563-2093

Cell: 705-676-7703

Email: guy.laurin@armstrong.ca

