WAWA WASTEWATER PERFORMANCE

Annual Report 2023

Prepared by:
Water & Sewer Department
Infrastructure Services

February 2024

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Prepared by: Municipality of Wawa
Infrastructure Services
Water & Sewer Department

Rebecca Weatherall — Feb 8/24

Rebecca Weatherall, P.Eng – Assistant Director, Infrastructure Services — Date
David Lowe, ORO – Water and Wastewater Operator
Josée Parisé – Water and Wastewater Operator
Dan Peters - Water and Wastewater Operator

Reviewed by:

Feb 8, 2024

Daniel Beach, CRS – Director, Infrastructure Services — Date

Presented to Council: February 20, 2024
Date

Presentation Confirmed by Resolution: February 20, 2023 Resolution No. RC24034
Date

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Appendices

Report Period:	January 1 to December 31, 2023
Wastewater System Name:	Municipality of Wawa Sewage Treatment Lagoon
Sewage System Address:	Golf Course Road, Wawa ON P0S 1K0
MOE Works Number:	110000454
Prepared By:	Municipality of Wawa – Infrastructure Services Water & Sewer Department

Public access to this report is available at Town Hall (40 Broadway Avenue, Wawa ON) and on the Municipal website www.wawa.cc

1.0 Introduction

1.1 Facility Description

The Wawa Sewage Treatment Lagoon was constructed between 1986-1987 and officially opened August 9, 1988, in partnership with the Ministry of the Environment, Ministry of Northern Development and Mines, and The Corporation of the Municipality of Wawa.

Wawa Sewage Collection is a Class 2 System, consisting of a gravity feed system with the exception of a forced sewer main at the west end of Government Road. Approximately 20 homes are on the forced main, each home is equipped with a holding tank (consisting of solid side and grey water side) and each with its own sewage pump on the grey water side of the tank, which pumps the grey water into the force main.

Sewage is pumped into the forced main to the intersection of Government Road and Tamarack Street, where a gravity sewer system takes over.

The Wawa Sewage Treatment Plant is a Class 1 plant which consists of 2 aeration ponds that are used for primary treatment. Aluminum Sulphate is added at the end of the second aeration pond before going into the polishing ponds to aid in phosphorus removal. Aluminum Sulphate is considered our secondary treatment. Once the treated effluent is transferred into the polishing ponds for a predetermined amount of time, then it is discharged into the Magpie River on a continuous basis.

The Sewage Treatment Plant building is equipped with two blowers for the aeration ponds, two chemical feed pumps for Aluminum Sulphate and a milltronics OCM II (open channel monitor) for data logging. An open channel flow meter is used to monitor treated effluent leaving the aeration system before being transferred to the polishing pond.

1.2 Sewage Treatment Chemicals

Sewage treatment chemicals used over this reporting period include:

- Aluminum Sulphate [$Al_2(SO_4)_3$] is used for phosphorus removal.

1.3 Expenses

In 2023, one of the sluice gates seized open and required some new parts to repair the gate. In addition to the gate, the outflow OCM monitor reached the end of its useful life and needed replacement to ensure that accurate effluent flow measurements were being captured.

Table 1 summarizes the expenses incurred over the reporting period:

Table 1: Sewage Treatment Lagoon Expenses

Expense Description		Cost
Sluice Gate Repair Work		$2,808.05
New OCM Monitor & Ultrasonic Level Controller		$6,713.67
	Total Cost	$9,521.72

1.4 Certificates

An amended Environmental Compliance Approval (0752-ADXQUC) was issued on October 12, 2016.

2.0 Wastewater Monitoring

2.1 Monitory Program Summary

The Sewage Treatment Lagoon's Environmental Compliance Approval (ECA) outlines the facility's effluent objectives and limits. Effluent objectives relate to the effluent quality that the facility should be able to achieve on an average day, assuming that the facility is well operated and that there are no unusual problems within the facility. Furthermore, effluent limits relate to the maximum pollutant concentrations in the effluent that the facility's treatment process must achieve. Table 2 and Table 3 outline the facility's effluent objectives and limits.

To ensure that the effluent from the Sewage Treatment Lagoon meets the effluent limits outlined in the facility's ECA, the following parameters are sampled for at regular weekly or monthly intervals:

- Five-day Biochemical Oxygen Demand (BOD_5);
- Five-day Carbonaceous Oxygen Demand ($CBOD_5$);
- Dissolved Oxygen (DO);
- Escherichia coli (E. coli);
- pH;
- Temperature;
- Total Ammonia Nitrogen (TAN);
- Total Kjeldahl Nitrogen (TKN);
- Total Phosphorus (TP);
- Total Suspended Solids (TSS); and
- Unionized Ammonia.

Table 4 to Table 6 summarize the sampling frequency of each wastewater parameter. A description of each parameter is included in Appendix A.

Table 2: Effluent Objectives

Effluent Parameters	Concentration Objectives
CBOD5	20.0 mg/L
Total Suspended Solids	25.0 mg/L
Total Phosphorus	0.8 mg/L

Table 3: Effluent Limits

Effluent Parameters	Average Concentration Limits
CBOD5	25.0 mg/L
Total Suspended Solids	30.0 mg/L
Total Phosphorus	1.0 mg/L

Table 4: Raw Sewage Monitoring

Parameters	Sample Type	Frequency
BOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly

Table 5: Aerated Lagoon Cells Content Monitoring

Parameters	Sample Type	Frequency
Dissolved Oxygen	Grab	Weekly

Table 6: Final Effluent Monitoring

Parameters	Sample Type	Frequency
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
Total Ammonia Nitrogen	Composite	Weekly
E.coli	Grab	Weekly
Temperature	Grab	Weekly
pH	Grab	Weekly
Unionized Ammonia	Calculated	Weekly

2.2 Sampling Results

2.1.1 Raw Sewage Sampling Results

Raw sewage coming into the sewage treatment lagoons is sampled monthly for the concentrations of BOD_5, TSS, TP and TKN. The minimum, average and maximum monthly concentrations for each of the parameters are summarized in Table 7. A complete table with the monthly results can be found in Appendix B.

Table 7: Summary of Monthly Raw Sewage Sampling Results

Parameter	Minimum	Average	Maximum
BOD5 (mg/L)	55.90	84.67	102.00
TSS (mg/L)	36.30	68.99	111.00
TP (mg/L)	1.67	2.73	3.41
TKN (mg/L)	17.70	26.37	34.80

2.1.2 Effluent Sampling Results

Effluent water from the lagoons is sampled weekly for the concentrations of $CBOD_5$, TSS, TP, TAN, E. Coli, field temperature and field pH. Where samples are tested to have a pH less than 6.5 or higher than 9.5, a report must be made to the Ministry of the Environment, Conservation and Parks. The minimum, average and maximum monthly concentrations for each of the parameters are summarized in Table 8. A complete table with the weekly results can be found in Appendix B.

Table 8: Summary of Weekly Effluent Sampling Results

Parameter	Minimum	Average	Maximum
CBOD5 (mg/L)	<2.0	4.25	10.50
TSS (mg/L)	<3.0	8.39	30.90
TP (mg/L)	0.04	0.20	1.00
TAN (mg/L)	0.01	2.55	16.80
E. Coli (MPN/100mL)	<10	155.36	620.00
Field Temperature (°C)	0.94	9.76	22.90
Field pH	3.00	7.76	10.10

(1) Minimum detectable limit for CBOD5 is 2.0 mg/L, TSS is 3.0 mg/L and E. Coli is 10 mg/L

2.1.3 Dissolved Oxygen Sampling Results

Each of the lagoon cells is equipped with an aeration system to assist with the treatment of the incoming sewage. Each cell is sampled weekly for dissolved oxygen concentration. Table 9 summarizes the minimum, average and maximum dissolved oxygen concentration for each cell. A complete table with the weekly results can be found in Appendix B.

Table 9: Summary of Weekly Dissolved Oxygen Sampling Results

Cell Number	Minimum (mg/L)	Average (mg/L)	Maximum (mg/L)
1	0.17	1.13	2.53
2	0.28	1.31	3.35

3.0 Wastewater Flows

The Wawa Sewage Treatment Lagoon has a rated capacity of 4,300 m^3/d and continuously discharges to the Magpie River. The annual average effluent flow rate of the lagoon was 2,309 m^3/d, approximately 54% of the lagoon's rated capacity. The maximum daily flow in 2023 was 7,580 m^3/d, which occurred in July. It should be noted that through out the year, staff struggled to calibrate the original OCM monitor as it reached the end of its useful life. A new monitor was installed in November, which resulted in effluent flows returning to their typical values for the end of the year. The higher than normal effluent readings for 2023 are a direct result of the original OCM monitor not working as intended. Table 10 illustrates the monthly minimum, average, maximum and total effluent flows for 2023.

Table 10: Summary of Monthly Wastewater Effluent Flows

Month	Minimum Flow (m^3/d)	Average Flow (m^3/d)	% of Plant Capacity	Maximum Flow (m^3/d)	Total Flow (m^3)
January	1,781	2,340	54%	2,599	70,021
February	2,180	2,670	62%	3,972	72,303
March	2,016	2,619	61%	4,862	81,211
April	2,534	5,310	123%	6,796	154,618
May	2,135	1,515	35%	5,764	46,983
June	462	1,390	32%	2,420	40,499
July	1,132	1,820	42%	7,580	53,651
August	1,302	2,000	47%	3,822	59,843
September	1,340	3,140	73%	6,017	91,860
October	1,094	1,350	31%	1,836	38,899
November	1,062	1,510	35%	2,367	45,251
December	1,425	2,040	47%	2,900	61,369
Flows Summary	**Minimum Flow (m^3/d)**	**Average Flow (m^3/d)**	**% of Plant Capacity**	**Maximum Flow (m^3/d)**	**Total Flow (m^3)**
	462	2,309	54%	7,580	816,508

Appendix A

Definition of Terms

Term	Definition
BOD_5	Also known as $TBOD_5$, means five-day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogen oxygen demand.
$CBOD_5$	Five day carbonaceous (nitrification inhibited) biochemical oxygen demand measure in an unfiltered sample.
DO	Dissolved Oxygen refers to microscopic bubbles of gaseous oxygen (O_2) that are mixed in water and available to aquatic organisms for respiration—a critical process for almost all organisms. Primary sources of DO include the atmosphere and aquatic plants.
E. Coli	Escherichia coli is commonly regarded as one of first microorganisms of choice in water and wastewater quality monitoring programs and serves as the primary indicator for water contaminated with fecal matter due to their prevalence in the gut of warm-blooded animals as well as high numbers excreted in both humans and animals.
MECP	Ministry of the Environment, Conservation and Parks
m^3	Cubic metres
m^3/d	Cubic metres per day
mg/L	Milligram per litre (part per million)
pH	A measure of how acidic/basic water is. The range goes from 0 - 14, with 7 being neutral. PH's of less than 7 indicate acidity, whereas a PH of greater than 7 indicates a base. PH is really a measure of the relative amount of free hydrogen and hydroxyl ions in the water.
TAN	Total Ammonia Nitrogen: Ammonia exists in two forms in the water, (1) NH_3 (this is called unionized ammonia), and (2) NH_4^+ (this is called ionized ammonia). Together, these two forms of ammonia are called TAN which means total ammonia nitrogen. NH_3 is the principal form of toxic ammonia.
TKN	Total Kjeldahl Nitrogen is the total concentration of organic nitrogen and ammonia.
TP	Total Phosphorus refers to the amount of phosphorus in a sample. Excess TP stimulates algae and weed growth that may cause fluctuations in dissolved oxygen in the receiving waters.
TSS	Total Suspended Solids are solid organic and inorganic materials that hang below the water surface. Suspended solids, in layman's terms, are similar to stirring up the sand near the shore of a lake. The water turns cloudy from the suspended solids. Total suspended solids must be coarse enough to be trapped by a coffee filter.

Term	Definition
Unionized Ammonia	Is the calculation using total ammonia concentration, PH and temperature using the methodology stipulated in "Ontario Provincial Water Quality Objectives".

Appendix B

Annual Sampling Results

Table B-1: Monthly Raw Sewage Sampling Results

Date	BOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)
January	80.1	43.4	2.41	28.2
February	55.9	47	2.13	17.7
March	62.2	36.3	2.45	24.2
April	73.6	56.1	2.27	18.2
May	91	78.7	1.67	24.3
June	102	94.6	3.34	33.1
July	99.9	97.5	3.41	28.1
August	95.5	93.3	3.04	28
September	82.3	111	3.31	30.2
October	100	56.5	2.83	27.6
November	91.9	63.3	3.36	34.8
December	81.6	50.2	2.52	22

Table B-2: Weekly Effluent Sampling Results

Date	CBOD5[1] (mg/L)	TSS[1] (mg/L)	TP (mg/L)	TAN (mg/L)	E. Coli[1] (MPN/100mL)	Field Temperature (°C)	Field pH
03-Jan-23	2.9	5.1	0.31	5.23	86	2.03	7.71
09-Jan-23	3.3	3.8	0.348	5.56	74	2.05	7.41
16-Jan-23	3.3	3.7	0.362	6.2	52	1.87	7.77
23-Jan-23	2.8	3.8	0.402	6.81	30	1.70	7.57
30-Jan-23	2.3	3.6	0.465	16.8	148	1.62	7.44
06-Feb-23	2.4	<3.0	0.45	9.27	441	1.15	7.25
13-Feb-23	3.3	<3.0	0.389	7.2	480	1.3	9.16
21-Feb-23	3.2	<3.0	0.5	7.03	459	1.3	9.23
27-Feb-23	3.4	3.6	0.999	7	620	1.2	8.77
06-Mar-23	3.1	<3.0	0.472	6.57	173	1.15	7.25
13-Mar-23	3.6	7.4	0.543	7.25	41	1.10	8.41
21-Mar-23	3.3	6.4	0.439	7.37	299	1.03	7.88
27-Mar-23	4.3	5.7	0.377	7.03	465	0.99	9.34
03-Apr-23	3.5	6.8	0.494	7.32	292	1.02	9.03
11-Apr-23	3.4	8	0.464	7.86	10	0.94	9.28
24-Apr-23	3.2	4.7	0.18	4.15	<10	2.36	7.32
01-May-23	5.1	9.2	0.115	1.56	<10	4.25	6.15
08-May-23	8.9	29.9	0.139	0.412	<10	10.43	9.22
15-May-23	9.5	17	0.115	0.007	<10	15.29	8.88
23-May-23	6.3	16.3	0.146	0.0109	<10	15.75	5.74
29-May-23	3.1	9.1	0.122	0.0155	<10	15.79	6.21
05-Jun-23	3.2	11.9	0.109	0.0125	10	22.34	8.31

Date	CBOD5[1] (mg/L)	TSS[1] (mg/L)	TP (mg/L)	TAN (mg/L)	E. Coli[1] (MPN/100mL)	Field Temperature (°C)	Field pH
12-Jun-23	3.4	9.3	0.123	0.0392	10	15.56	9.48
19-Jun-23	4.6	9.8	0.122	0.0178	10	19.08	9.17
26-Jun-23	<2.0	<3.0	0.0975	0.262	<10	20.47	9.01
04-Jul-23	<2.0	3	0.0815	0.394	<10	22.16	6.40
10-Jul-23	<2.0	<3.0	0.0894	0.324	20	22.16	6.26
17-Jul-23	<2.0	4	0.065	0.21	52	21.15	6.00
24-Jul-23	<2.0	3.3	0.069	0.0314	20	22.61	6.05
31-Jul-23	<2.0	3.1	0.0831	0.0975	52	21.11	6.00
08-Aug-23	<2.0	3.7	0.114	0.0361	10	22.90	7.60
14-Aug-23	<2.0	5.2	0.0664	0.009	<10	19.73	9.40
21-Aug-23	<2.0	<3.0	0.041	0.0084	10	20.12	9.40
28-Aug-23	<2.0	3.3	0.0574	0.0331	<10	17.52	9.25
05-Sep-23	<2.0	3.3	0.0494	0.0186	<10	20.33	9.40
11-Sep-23	<2.0	<3.0	0.0523	0.0623	<10	16.53	9.14
18-Sep-23	<2.0	<3.0	0.0447	0.0061	<10	14.50	9.47
25-Sep-23	<2.0	4.2	0.0402	0.0139	<10	9.45	9.43
02-Oct-23	<2.0	3.4	0.0423	0.368	<10	16.98	9.45
10-Oct-23	<2.0	<3.0	0.0603	0.141	<10	10.03	9.48
16-Oct-23	2.2	4.6	0.0491	0.064	<10	8.61	9.60
23-Oct-23	2.5	7.8	0.0551	0.142	<10	7.00	10.10
30-Oct-23	<2.0	<3.0	0.0464	0.574	<10	5.15	7.26
06-Nov-23	8.2	14.4	0.134	0.0214	<10	4.14	7.45
13-Nov-23	7.6	16.6	0.126	0.114	<10	3.30	7.48
20-Nov-23	2.8	12	0.0727	0.0078	<10	3.22	8.45
27-Nov-23	10.5	30.9	0.236	0.0874	20	3.64	6.81
04-Dec-23	5.9	14	0.124	0.723	<10	5.20	3.78
11-Dec-23	3.2	11.5	0.117	1.16	<10	7.69	3.00
18-Dec-23	2.9	6.9	0.0945	2.07	<10	5.08	3.03
27-Dec-23	3.3	5.1	0.105	2.49	<10	5.75	3.03

(1) Minimum detectable limit for CBOD5 is 2.0 mg/L, TSS is 3.0 mg/L and E. Coli is 10 mg/L

Table B-3: Weekly Dissolved Oxygen Sampling Results

Date	Cell 1 DO (mg/L)	Cell 2 DO (mg/L)
03-Jan-22	2.43	0.76
09-Jan-22	2.17	2.33
16-Jan-22	1.87	2.2
23-Jan-22	2.32	2.09

Date	Cell 1 DO (mg/L)	Cell 2 DO (mg/L)
30-Jan-22	1.9	1.75
06-Feb-22	1.87	1.67
13-Feb-22	2.32	1.38
21-Feb-22	2.53	3.35
27-Feb-22		1.58
06-Mar-22	2.2	1.58
14-Mar-22	2.46	1.79
21-Mar-22	2.3	1.69
27-Mar-22	2.14	1.52
02-Apr-22	1.45	2.1
11-Apr-22	1.59	1.98
17-Apr-22	0.88	1.75
24-Apr-22	1.76	1.84
01-May-22	1.6	1.9
08-May-22	1.35	1.66
15-May-22	0.79	1.27
23-May-22	1.06	1.2
30-May-22	1.17	1.25
05-Jun-22	0.23	0.31
12-Jun-22	0.31	0.47
19-Jun-22	0.35	0.46
26-Jun-22	0.29	0.35
04-Jul-22	0.23	0.28
10-Jul-22	0.17	0.3
17-Jul-22	0.19	0.42
24-Jul-22	0.19	0.4
31-Jul-22	0.23	0.43
08-Aug-22	0.28	0.9
14-Aug-22	0.6	0.75
21-Aug-22	0.23	0.87
28-Aug-22	0.34	0.79
05-Sep-22	0.19	0.28
11-Sep-22	0.27	0.58
18-Sep-22	0.29	0.7
25-Sep-22	0.21	0.36
02-Oct-22	0.26	0.45
10-Oct-22	0.71	1.66
16-Oct-22	0.69	1.47
23-Oct-22	1.17	1.77
30-Oct-22	0.77	1.46
06-Nov-22	0.71	1.32
13-Nov-22	1.74	2.13

Date	Cell 1 DO (mg/L)	Cell 2 DO (mg/L)
20-Nov-22	1.63	1.27
27-Nov-22	1.52	1.88
04-Dec-22	1.39	1.7
11-Dec-22	1.67	1.55
18-Dec-22	1.24	1.64
27-Dec-22	1.32	2.3

Appendix C

Metcon Calibration Report

Rectangular Weir
W/End Contractions
Verification/Calibration Report

FLOWMETRIX

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL	
CUSTOMER	Corporation of the Municipality of Wawa
CONTACT	Dave Lowe
	Water & Wastewater Operator
	PO Box 500, 40 Broadway Ave
	Wawa ON, P0S 1K0
	T: 705-914-0291
	E: waterstaff@wawa.cc
VER. BY - FM	Daniel Gosse

Quality Management Standards Information -Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

EQUIPMENT DETAIL		
[MUT] MANUFACTURER		Siemens
MODEL		Multiranger 200 HMI
CONVERTER SERIAL NUMBER		PBD-R0180005
PLANT ID		Wawa Lagoon
METER ID		Effluent Flow
FIT ID		N/A
CLIENT TAG		N/A
OTHER		N/A
GPS COORDINATES	47.98341	-84.78614
VERIFICATION DATE		November 21st 2023
CAL. FREQUENCY		Annual
CAL. DUE DATE		November 2024

PROGRAMMING PARAMETERS		
THROAT WIDTH, (exp 1.5)	m	1.2
EMPTY DISTANCE, TX to notch	m	0.983
TRANSDUCER (TX), to sump flo	m	0.548
SUMP LEVEL, zero flow	m	-0.435
MAX. HEAD	m	0.548
BLANKING DISTANCE	m	0.300
DEAD ZONE	m	0.435
MAX. FLOW	LPS	813.0
F.S. RANGE - O/P	LPS	n/a

Ultrasonic sensor installed to ensure full scale flow condition

TOTALIZER		
AS FOUND	N/A	M3
AS LEFT	N/A	M3
DIFFERENCE	n/a	M3
TEST CRITERIA		
AS FOUND CERTIFICATION TEST		Yes
ALLOWABLE [%] ERROR		5
COMPONENTS TESTED		
CONVERTER DISPLAY		yes
SCADA		no
TOTALIZER		yes
ACCURACY BASED ON [% o.r.]		yes

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

AS FOUND TEST RESULTS

			1.9					**% F.S. Range**
			0.380					**m**
REF. FLOW RATE			**15.5**					LPS
MUT [Reading]			15.7					LPS
MUT [Difference]			0.2					LPS
MUT [% Error]			1.3					%
SCADA								
MUT [Reading]	min.	LPS						
MUT [Difference]	max.	LPS						
MUT [% Error]								
TOTALIZER - REF. FLOW RATE							**15.500**	LPS
TOTALIZER [MUT]							1	M3
TEST TIME							65.73	SECONDS
CALC. TOTALIZER							1.019	M3
ERROR							-1.88	%

COMMENTS

Head Reference measured head 160cm-122cm offset =38cm Meter Under Test = 38.7cm = 1.88% Difference

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	n/a
PROCESS METER	PM	2
STOP WATCH	SW	n/a

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	1.30	PASS
SCADA	N/A	N/A
TOTALIZER	-1.88	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

Service Report

November 29th, 2023

Customer: **Corporation of the Municipality of Wawa**
Dave Lowe
Water & Wastewater Operator
PO Box 500, 40 Broadway Ave
Wawa ON, P0S 1K0
T: 705-914-0291
E: waterstaff@wawa.cc

Service Location: Wawa Wastewater Lagoon Site Golf Crse Rd, Goulais River, ON P0S 1E0 (47.99591, -84.77203)

Date of Service: November 20th, 2023

Job #: 5088

Description: Install of Open Channel Flow Monitoring Device in a Rectangular Weir

Equipment Description:

- Siemens Multiranger 200 HMI SN# PBD-R0180005
- Milltronics OCMII Open channel Flow Meter
- 60 Meters of Sensor wire
- Level & Flow Verification Devices

Action Taken:

- Completed site assessment.
- Documented some previous parameters from old OCMII was not able to obtain all parameters from device. When attempting to access parameter menu the device gives an error message.
- Measured and documented all the characteristics of the rectangular weir and measured mounting points for the transducer.
- Removed old Milltronics OCMII open channel device (Milltronics OCMII Open channel Flow Meter)
- Installed and mounted the new Siemens device (Siemens Multiranger 200 HMI SN# PBD-R0180005) inside the cabinet in the lagoon station building.
- Mounted the Transducer in position over the rectangular weir.
- Ran 60meters of sensor cable from the weir to the lagoon station building the cable was mounted to the fence that runs towards the building and is planned to be buried under ground in the Spring / Summer when the ground thaws. The cable was run through the conduit at the rear of the building and then ran through the attic over to the cabinet where the Siemens device was installed.
- There was 3 conduit holes drilled into the Siemens Multiranger and ½ '' NPT cable glands were installed as well as a conduit hole and ½ '' cable gland was installed into the cabinet for proper cable installation.
- The 60 meters of sensor cable was not long enough so a wire extension was connected to reach the transmitter.
- The new Siemens Multiranger was wired and powered up with assistance from on-site electrician.
- The new Siemens Multiranger was fully programmed and setup all parameters.
- Verified device by taking a head reference measurement compared to what the device was reading to ensure accuracy of the device.

Summary:

- Old open channel device removed (Milltronics OCMII Open channel Flow Meter)
- New open channel device installed (Siemens Multiranger 200 HMI SN# PBD-R0180005)
- Recommend that the sensor cable be properly buried, when possible, as leaving it exposed to weather is not ideal but should not have any effect on the device.

Parameters Programed onto Siemens Multiranger 200 HMI

Transducer:	XRS-5	Flow Exponent:	1.5
Temp:	Transducer	Max Head:	54.8cm
Units:	CM	Zero Head:	0cm
Empty Distance:	98.3cm	Max Flow:	813 L/S
Span:	54.8cm	Flow Decimal:	2 Digits
Response:	Medium	Flow Time Units:	Seconds
Meas. Device:	Exponential	Low Flow Cut off:	0cm

Device Verification

Reference Measured Head = 160mm-122mm offset = 38mm
Device Reading= 38.73mm
Error Percentage= 1.9211%

Totalizer Test

Start= 1.038m3
Stop= 2.038m3
Difference= 1m3
Time= 65.73 seconds
Error Percentage= -1.88%

SCG FLOWMETRIX

How characteristics of a rectangular translates to head level and flow

Using predetermined equations and using the ISCO book for open channeling solving, we are able to input characteristics of any open channel and determine the parameters and expected outputs for the open channel device that is being programmed. For this case the lagoon rectangular weir and Siemens Multiranger 200 HMI. When programming the device, we used a similar method to the one below.

Rectangular Contracted Weir

This calculates the water flow rate over a rectangular contracted weir. This weir has a rectangular opening where the sides are straight up and down. A contracted weir means that the ditch or canal leading up to the weir is wider than the weir opening itself. The water before the weir should be held in a relatively calm and smooth pool. There should be air (not trapped) underneath the water leaving the weir. The Length is the bottom width of the weir. The height is measured from the bottom of the weir opening to the top of the water level ponded behind the weir (not the water level right as it leaves the weir). Learn more about the units used on this page.

Length:

1.2 m

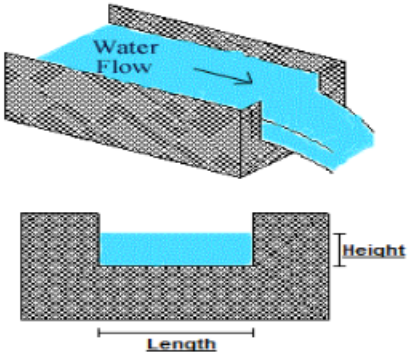
Height:

54.8 cm

Calculate

Flow Rate:

835.6 lps



* Note: 1 point = 1/100 ft.

The Equation

The Equation used to determine the flow rate (Q) of a Rectangular Contracted Weir is:

$$Q = 3.247 \cdot L \cdot H^{1.48} - \frac{0.566 L^{1.9}}{1 + 2 \cdot L^{1.87}} \cdot H^{1.9}$$

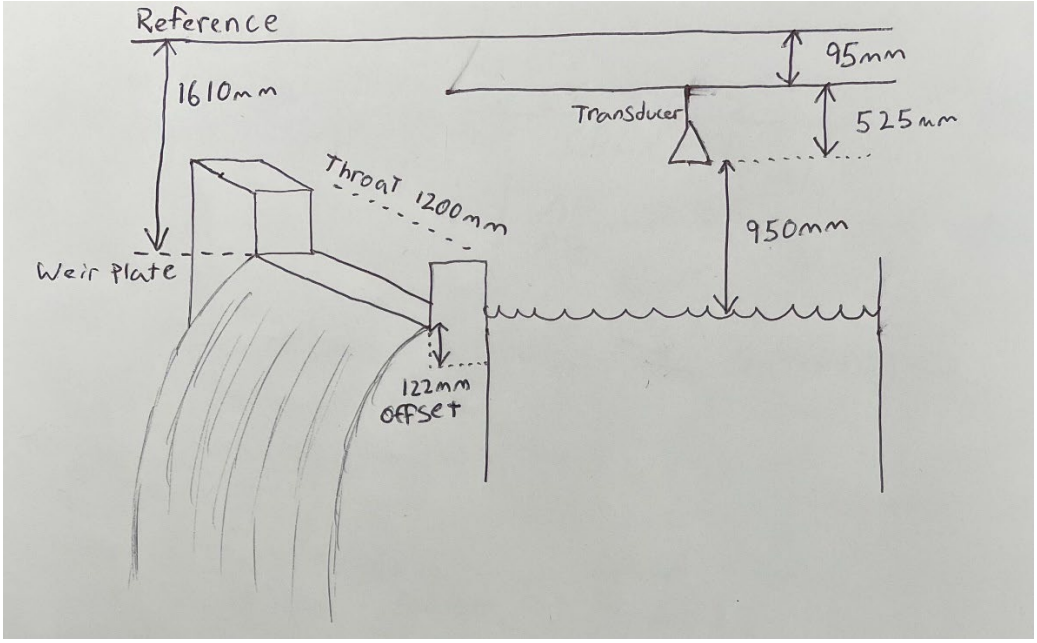
Where:

Q = Flow Rate in cfs.

L = Bottom width of the weir in feet.

H = Height of the upstream water above the weir crest in feet.

The Wawa Lagoon Specific Rectangular Weir Characteristics



Site Pictures

New Transmitter

Old Transmitter

Transducer & Weir

Weir & Flow

Daniel Gosse
Instrumentation Specialist
Cell: 519-521-8509
E: dgosse@scgflowmetrix.com

TECHNICIAN'S SIGNATURE: Daniel Gosse

Appendix D

Environmental Compliance Approval

#0752-ADXQUC

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 0752-ADXQUC
Issue Date: October 12, 2016

The Corporation of the Municipality of Wawa
40 Broadway Ave
Post Office Box, No. 500
Wawa, Ontario
P0S 1K0

Site Location: Wawa Wastewater Treatment Facility
Golf Course Road
Municipality of Wawa, District of Algoma

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

municipal sewage works for the treatment of sanitary sewage and disposal of effluent to Magpie River via a Sewage Treatment Plant (Wawa Wastewater Treatment Facility) having a Rated Capacity of 4,300 m 3 /d, as follows:

Proposed Works

Septage Receiving Station

- a septage receiving station located near the intersection of Mission Road/Hwy 101 and Golf Course Road, equipped with a connection pipe complete with a cam-lock fitting and lockable cap on an asphalt pad, discharging into the trunk sanitary sewer flowing to the Sewage Treatment Plant;

Wawa Wastewater Treatment Facility

Aerated Lagoon Cells

- replacement of the existing aeration system in aerated lagoons Cell No. 1 and Cell No. 2 with fine bubble aeration system;

- replacement of the existing air blower system with two (2) air blowers (one standby), each rated at 26 m3/min at 37.2 kPa and equipped with VFD;

Previous Works

Wawa Wastewater Treatment Facility

an aerated lagoon system located on Golf Course Road in the Municipality of Wawa (UTM Zone 16T 665235 E 5316817 N), having a Rated Capacity of 4,300 m3/day, discharging effluent into Magpie River:

Inlet Chamber

- a 375 mm diameter influent sewer and one (1) inlet chamber equipped with basket screen, discharging to aerated lagoon Cell No. 1;

Aerated Lagoon Cells

- aerated lagoon Cell No.1 with a storage volume of approximately 38,040 m3, discharging to aerated lagoon Cell No.2;
- aerated lagoon Cell No.2 with a storage volume of approximately 36,600 m3, discharging via an effluent chamber to polishing lagoon Cell No. 3;
- one (1) recirculation pump located in the effluent chamber of Cell No. 2, rated at 22.6 L/s at 7.9 m TDH, pumping effluent back to the inlet chamber;
- air blower system;

Polishing Lagoon Cells

- polishing lagoon Cell No.3 with a surface area of approximately 8.1 ha and an operating depth of 1.4 m, discharging to polishing lagoon Cell No.4;
- polishing lagoon Cell No.4 with a surface area of approximately 8.1 ha and an operating depth of 1.4 m discharging to the final effluent chamber;

Phosphorus Removal

- one (1) 18,400 L phosphorus removal chemical storage tank;
- two (2) chemical metering pumps (one standby), each with a capacity of 7.0 L/h, with chemical dosing to the effluent chamber of aerated lagoon Cell No. 2;

Effluent Outfall

- one (1) Final Effluent chamber, equipped with an adjustable weir gate**;**
- one (1) 450 mm diameter effluent pipe, discharging through an outfall structure at the bottom of the Magpie River;

including all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works,
all in accordance with the submitted supporting documents listed in Schedule A.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval" means this entire document and any schedules attached to it;
"Annual Average Daily Flow" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"Bypass" means diversion of sewage around one or more unit processes within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling location, and discharging to the environment through the Sewage Treatment Plant outfall;

"CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"Daily Concentration" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

"*E. Coli*" refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius;

"Emergency Situation" means a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Treatment Plant or an unforeseen flow condition that may result in:

a. danger to the health or safety of any person; or,
b. injury or damage to any property, or serious risk of injury or damage to any property; or
c. treatment process biomass washout.

"Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of a named equipment;

"Event" means an action or occurrence, at a given location within the Sewage Treatment Plant that causes a Bypass or Overflow. An Event ends when there is no recurrence of a Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Bypass or Overflow. An Overflow and a Bypass are two separate reportable Events even when occurring concurrently;

"Final Effluent" means sewage discharge via the Sewage Treatment Plant outfall;

"Limited Operational Flexibility" (LOF) means any modifications that the Owner is permitted to make to the Works under this Approval;

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

"Monthly Average Concentration" means the arithmetic mean of all Daily Concentrations of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"Owner" means The Corporation of the Municipality of Wawa and its successors and assignees;

"OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;

"Overflow" means a discharge to the environment from the Works at a location other than the Sewage Treatment Plant effluent outfall or into the effluent outfall downstream of the Final Effluent sampling location;

"Previous Works" means those portions of the sewage works previously constructed and approved under an approval;

"Proposed Works" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;

"Rated Capacity" means the Annual Average Daily Flow for which the Sewage Treatment Plant is approved to handle;

"Sewage Treatment Plant" means the entire sewage treatment and effluent discharge facility;

"Substantial Completion" has the same meaning as "substantial performance" in the *Construction Lien Act;*

"Water Supervisor" means the Water Supervisor for the Sudbury and Sault Ste. Marie offices of the Ministry; and

"Works" means the sewage works described in the Owner's application, and this Approval, and includes Proposed Works, Previous Works, and modifications made under Limited Operational Flexibility.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the documents listed in the Schedule A, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. CHANGE OF OWNER

(1) The Owner shall notify the Water Supervisor and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

a. change of Owner;
b. change of address of the Owner;
c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c.B17 shall be included in the notification to the Water Supervisor;
d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C39 shall be included in the notification to the Water Supervisor;

(2) In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the Water Supervisor and the Director.

3. COMPLETION OF THE PROPOSED WORKS

(1) All Proposed Works in this Approval shall be completed and commissioned within five (5) years of issuance of this Approval.

(2) One (1) week prior to the start up of the operation of the Proposed Works, the Owner shall notify the Water Supervisor (in writing) of the pending start up date.

(3) Upon the Substantial Completion of the Proposed Works, the Owner shall prepare a statement, certified by a Professional Engineer, that the Proposed Works are constructed in accordance with this Approval, and shall make the written statement to notify the Water Supervisor.

(4) Within one (1) year of the Substantial Completion of the Proposed Works, a set of as-built drawings showing the Works "as constructed" shall be prepared or updated. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

4. BYPASSES

(1) Any Bypass is prohibited, except:

a. in an Emergency Situation;
b. where the Bypass is a direct and unavoidable result of a planned maintenance procedure or other special circumstances, the Owner notified the Water Supervisor 15 days prior to the Bypass and the Water Supervisor has given written consent of the Bypass;

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) and the Medical Officer of Health of all Bypass Events. This notice shall include, at a minimum, the following information:

a. the date, time, and duration of the Event;
b. the location of the Event;
c. the measured or estimated volume of the Event (unless the Event is ongoing);
d. the reason for the Event; and
e. the level of treatment the Bypass received and disinfection status of same.

(3) The Owner shall submit Bypass Event Reports to the Ministry's local office on a quarterly basis, no later than each of the following dates for each calendar year: February 14, May 15, August 14, and November 15. Event Reports shall be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Events that occurred during the preceding quarter:

a. the date of the Event(s);
b. the measured or estimated volume of the Event(s);
c. the duration of the Event(s);
d. the location of the Event(s);
e. the reason for the Event(s); and
f. the level of treatment the Bypasses received and disinfection status of same.

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the Bypass and have it analyzed for parameters outlined in Condition 7 using the protocols specified in Condition 9, one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such Bypass.

5. OVERFLOWS

(1) Any Overflow is prohibited, except:

a. in an Emergency Situation;

b. where the Overflow is a direct and unavoidable result of a planned maintenance procedure or other special circumstances, the Owner notified the Water Supervisor 15 days prior to the Overflow and the Water Supervisor has given written consent of the Overflow;

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) and the Medical Officer of Health of all Overflow Events. This notice shall include, at a minimum, the following information:

a. the date, time, and duration of the Event;
b. the location of the Event;
c. the measured or estimated volume of the Event (unless the Event is ongoing);
d. the reason for the Event; and
e. the level of treatment the Overflows received and disinfection status of same.

(3) The Owner shall submit Overflow Event Reports to the Ministry's local office on a quarterly basis, no later than each of the following dates for each calendar year: February 14, May 15, August 14, and November 15. Event Reports shall be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Events that occurred during the preceding quarter:

a. the date of the Event(s);
b. the measured or estimated volume of the Event(s);
c. the duration of the Event(s);
d. the location of the Event(s);
e. the reason for the Event(s); and
f. the level of treatment the Overflows received and disinfection status of same.

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the Overflow and have it analyzed for parameters outlined in Condition 7 using the protocols specified in Condition 9, one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such Overflow. For raw sewage and primary treatment system Overflows, BOD5 shall be monitored instead of CBOD5.

6. EFFLUENT OBJECTIVES

(1) The Owner shall use best efforts to design, construct and operate the Works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Sewage Treatment Plant.

Table 1 - Effluent Objectives

Effluent Parameter	**Concentration Objective** (milligrams per litre unless otherwise indicated)
CBOD5	20.0
Total Suspended Solids	25.0
Total Phosphorus	0.8

(2) The Owner shall use best efforts to:

a. maintain the pH of the effluent from the Sewage Treatment Plant within the range of 6.5 - 8.5, inclusive, at all times;
b. operate the Works within the Rated Capacity of the Sewage Treatment Plant;
c. ensure that the effluent from the Sewage Treatment Plant 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 discolouration on the receiving waters;

7. EFFLUENT LIMITS

(1) The Owner shall operate and maintain the Works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Sewage Treatment Plant.

Table 2 - Effluent Limits	
Effluent Parameter	**Average Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2
CBOD5	25.0
Total Suspended Solids	30.0
Total Phosphorus	1.0

(2) For the purposes of determining compliance with and enforcing subsection (1):

a. the Monthly Average Concentration of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(3) The Owner shall operate and maintain the Works such that the pH of the effluent from the Sewage Treatment Plant is maintained within the range of 6.0 - 9.5, inclusive, at all times.

(4) Subsections (1) and (3) shall apply upon the issuance of this Approval.

8. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this Approval and the OWRA and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

(2) The Owner shall maintain an operations manual, that includes, but not necessarily limited to, the following information:

a. operating procedures for routine operation of the Works;
b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;
c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;
d. procedures for the inspection and calibration of monitoring equipment;
e. a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and
f. procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Sewage Treatment Plant for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall provide for the overall operation of the Works with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The Owner shall, upon commencement of operation of the Works, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

a. Weekly means once each week;
b. Monthly means once every month.

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Raw Sewage Monitoring
(Inlet Chamber)

Parameters	Sample Type	Frequency
BOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly

Table 4 - Aerated Lagoon Cells Content Monitoring
(Cells No.1 and No.2)

Parameters	Sample Type	Frequency
Dissolved Oxygen	Grab	Weekly

Table 5 - Final Effluent Monitoring
(Final Effluent Chamber)

Parameters	Sample Type	Frequency
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
Total Ammonia Nitrogen	Composite	Weekly
E. coli	Grab	Weekly
Temperature	Grab	Weekly
pH	Grab	Weekly
Unionized Ammonia	Calculated	Weekly

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

a. the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;
b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;
c. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

(5) The temperature and pH of the effluent from the Sewage Treatment Plant shall be determined in the field at the time of sampling for Total Ammonia Nitrogen. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology

stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized).

(6) The Owner shall install and maintain (a) continuous flow measuring device(s), to measure the flowrate of the influent to or effluent from the Sewage Treatment Plant with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

(7) The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

10. REPORTING

(1) The Owner shall report to the Water Supervisor or designate, any exceedence of the average concentration of any parameter specified in Effluent Limits Condition orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.

(2) In addition to the obligations under Part X of the *Environmental Protection Act*, the Owner shall, within ten (10) working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the Water Supervisor describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(3) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

(4) The Owner shall prepare and submit a performance report to the Water Supervisor on an annual basis, by March 31 of the year following the end of the calendar year being reported upon. The reports shall contain, but shall not be limited to, the following information:

a. a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Effluent Limits Condition, including an overview of the success and adequacy of the Works;
b. a description of any operating problems encountered and corrective actions taken;
c. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
d. a summary of any effluent quality assurance or control measures undertaken in the reporting period;
e. a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and
f. a description of efforts made and results achieved in meeting the objectives of Effluent Objectives Condition.
g. an estimate of the sludge volumes in the lagoon cells. Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period;
h. a summary of any complaints received during the reporting period and any steps taken to address the complaints;
i. a summary of all Bypass, Overflow, spill or abnormal discharge events;
j. a copy of all Notice of Modifications for Sewage Works submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification;

k. a report summarizing all modifications completed as a result of Schedule B, Section 3; and

l. any other information the Water Supervisor requires from time to time.

(7) The Owner shall, within thirty (30) calendar days of issuance of this Approval, submit a Municipal and Local Services Board Wastewater System Profile Information Form, and shall resubmit the updated document every time a notification is provided to the Water Supervisor in compliance with requirements of change of ownership under this Approval.

11. LIMITED OPERATIONAL FLEXIBILITY (MODIFICATIONS TO THE WORKS)

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works ", included under Schedule B of this Approval, as amended.

(2) Sewage works proposed under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

a. Modifications to the Works that result in an increase of the Rated Capacity of the Works;
b. Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;
c. Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;
d. Modifications to the Works approved under s.9 of the EPA, and
e. Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, as deemed necessary in consultation with the Water Supervisor, provide a revised copy of this plan for approval to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any modification made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act* and *Greenbelt Act.*

(8) Prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications for Sewage Works describing any proposed modifications to the Works and submit it to the Water Supervisor.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work

pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

3. Condition 3 is included to ensure that the Works are constructed in a timely manner so that standards applicable at the time of Approval of the Works are still applicable at the time of construction, to ensure the ongoing protection of the environment. It also ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are updated and maintained for future references.

4. Condition 4 is included to indicate that Bypass of any treatment process of unit is prohibited, save in certain limited circumstances where the failure to Bypass could result in greater injury to the public interest than the Bypass itself where a Bypass will not violate the approved effluent requirements, or where the Bypass can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Bypass events.

5. Condition 5 is included to indicate that Overflows of untreated or partially treated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to Overflow could result in greater injury to the public interest than the Overflow itself or where the Overflow can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Overflow events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the Owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 7 are exceeded.

7. Condition 7 is imposed to ensure that the effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

9. Condition 9 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the Approval and that the Works does not cause any impairment to the environment.

10. Condition 10 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

11. Condition 11 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has

not been asked to consider. These Conditions are also included to ensure that a Professional Engineer has reviewed the proposed modifications and attests that the modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed modifications comply with the Ministry's requirements stipulated in the Terms and Conditions of this Approval, MOE policies, guidelines, and industry engineering standards and best management practices.

Schedule A

1. "Evaluation Study - Wawa Waste Stabilization Ponds - Stage 2, Future Treatment Requirements, may 1985 prepared by Knox martin Kretch;
2. Environmental Compliance Approval Application submitted by Kresin Engineering Corporation and received on August 18, 2014, including Design report and engineering drawings and specifications.

3. Environmental Compliance Approval Application submitted by Kresin Engineering Corporation and received on June 1, 2016, for the re-location of the proposed septage receiving station, including technical memorandum and engineering plans.

Schedule B

Limited Operational Flexibility Criteria for Modifications

to Municipal Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications for Sewage Works. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.
b. Forcemain relining and replacement with similar pipe size where the nominal diameter is not greater than 1,200mm.

1.2 Sewage Treatment Process

a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.
b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent’s land.
c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.
d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to

the works that result in an increase of the approved Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.

e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same or exceeded. For clarity purposes, the following equipment can be considered under this provision: pumps, screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester systems.

1.3 Sewage Treatment Plant Outfall

a. Replacement of discharge pipe with similar pipe size or diffusers provided that the outfall location is not changed.

1.4 Sanitary Sewers

a. Pipe relining and replacement with similar pipe size within the Sewage Treatment Plant site, where the nominal diameter is not greater than 1,200mm.

1.5 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:
   i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
   ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
   iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and Water Supervisor three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are not required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 6343-9VLPM9 issued on July 13, 2015.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of October, 2016

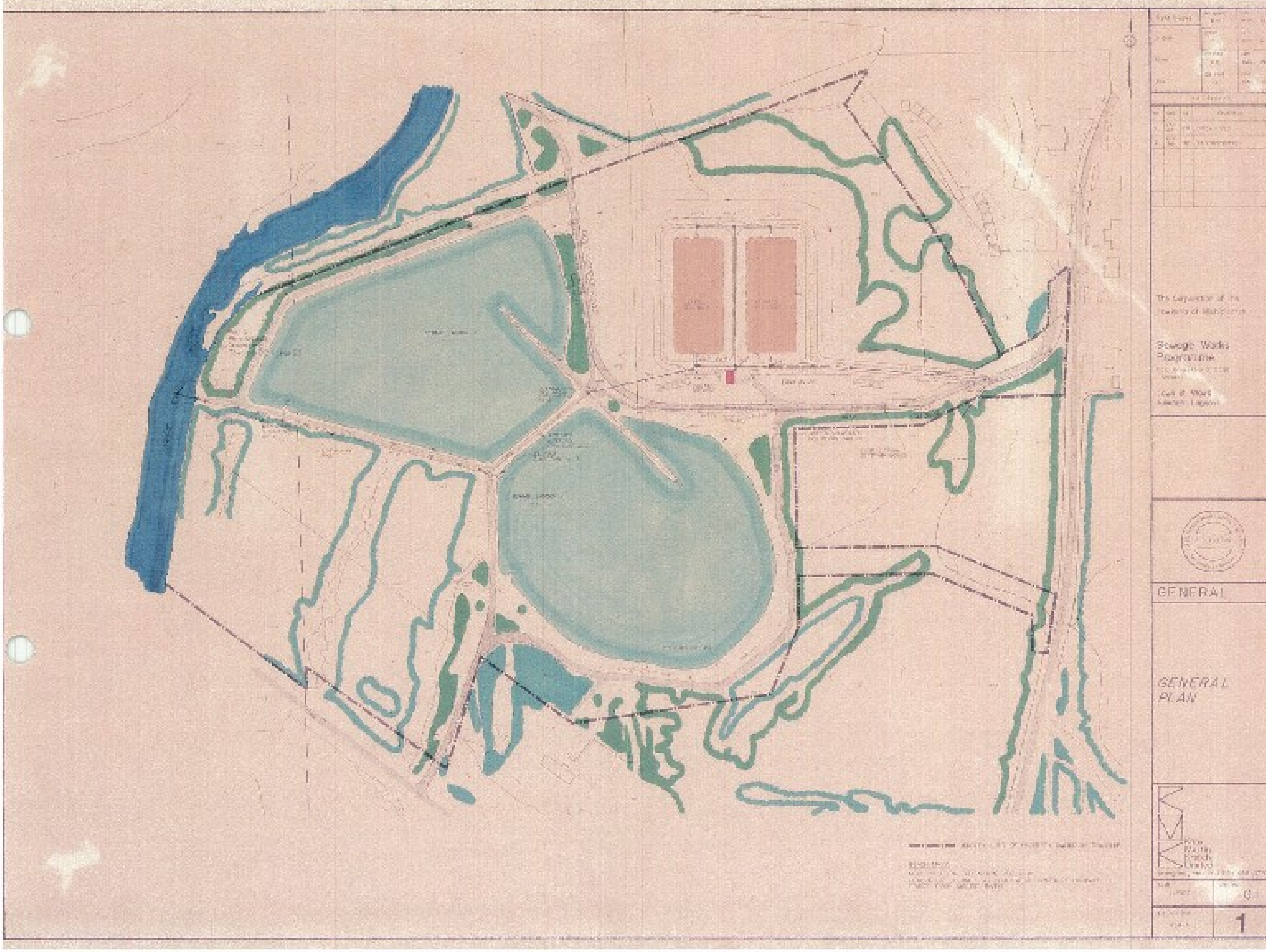
Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

FL/
c: Area Manager, MOECC Sault Ste. Marie

c: DWMD Supervisor, MOECC Sudbury
Rekha Chetlur, Registration and Compliance Section, MOECC Drinking Water Programs Branch – IMBS
Orlan Euale, P.Eng., Kresin Engineering Corporation

Appendix E

Sewage Lagoons Site Plan


Sewage Works
Programme
GENERAL
GENERAL
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Appendix F

MECP Wawa Lagoon

2017 Inspection Report

Ministry of the Environment and Climate Change

Sector Compliance Branch
305 Milner Ave, Suite 1000
Scarborough, ON M1B 3V4
Tel.: 416-314-4278
Fax.: 416-314-4464

Ministère de l'Environnement et de l'Action en matière de changement climatique

Direction de la mise en conformité des secteurs
305, avenue Milner, bureau 1000
Scarborough, ON M1B 3V4
Tél.: 416-314-4278
Téléc.: 416-314-4464

Ontario

March 26, 2018

The Corporation of the Municipality of Wawa
40 Broadway Avenue
Wawa, ON
P0S 1K0

Attn: Cory Stainthorpe

Re: Inspection at Wawa Lagoon

On October 24, 2017, I conducted an inspection at the above mentioned waste water treatment plant to assess compliance with the terms and conditions of the Environmental Compliance Approval issued for the treatment system for the period between January 1, 2017 and the date of the inspection.

Please find attached Inspection Report #1-G1Z37.

If you have any questions, please contact me for assistance at: Tel: 416-212-6685; or by Email: scott.steeves@ontario.ca

Sincerely,

Scott Steeves
Provincial Officer (Badge # 1605)
Ministry of the Environment
Sector Compliance Branch

Tel: 416 212-6685
Fax: 416 314-4464
Scott.steeves@ontario.ca

Enclosed: Inspection Report Number # 1- 1-G1Z37

Ontario

Ministry of the Environment and Climate Change

WW WAWA LAGOON

Inspection Report

Site Number:	110000454
Inspection Number:	1-G1Z37
Date of Inspection:	Oct 24, 2017
Inspected By:	Scott Steeves

OWNER INFORMATION:

Company Name:	WAWA, THE CORPORATION OF THE MUNICIPALITY OF		
Street Number:	40	**Unit Identifier:**	
Street Name:	BROADWAY AVE		
City:	WAWA		
Province:	ON	**Postal Code:**	P0S 1K0

CONTACT INFORMATION

Type:	Operator	**Name:**	Marc Liard
Phone:		**Fax:**	
Email:			
Title:			

Type:	Operating Authority	**Name:**	Cory Stainthorpe
Phone:	(705) 856-2244	**Fax:**	
Email:	cstainthorpe@wawa.cc		
Title:	Director of Infrastructure Services		

INSPECTION DETAILS:

Site Name:	WW WAWA LAGOON
Site Address:	0 GOLF COURSE Road WAWA ON P0S 1K0
County/District:	MICHIPICOTEN
MOECC District/Area Office:	Sault Ste. Marie Area Office
Health Unit:	ALGOMA HEALTH UNIT
Conservation Authority:	
MNR Office:	
Site Number:	110000454
Inspection Type:	Announced
Inspection Number:	1-G1Z37
Date of Inspection:	Oct 24, 2017
Date of Previous Inspection:	Oct 22, 2012

COMPONENTS DESCRIPTION

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry policies and guidelines during the inspection period. This wastewater treatment and collection system is subject to the legislative requirements of the Ontario Water Resources Act (OWRA) and the Environmental Protection Act (EPA) and regulations made therein. This inspection has been conducted pursuant to Section 15 of the OWRA and Section 156 of the EPA. This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.**

  The Wawa Wastewater Treatment Plant is a Class 1 Wastewater Treatment System, located at Golf Course Road within the Municipality of Wawa, District of Algoma. The Wawa Wastewater Treatment Plant is owned and operated by the Corporation of the Municipality of Wawa. The Wawa Wastewater Treatment Facility is operated in accordance with the terms and conditions of Certificate of Approval (ECA) # 0752-ADXQUC, issued October 12, 2016 by the Ministry of the Environment and Climate Change (Ministry).

  The Wawa Wastewater Treatment Facility serves the community of Wawa. The treatment plant consists of: inlet works, two aerated lagoon cells, two polishing lagoon cells and chemical phosphorus removal. The Wawa Wastewater Treatment Facility is designed to treat a rated capacity of 4,300 m3/day and discharges to the Magpie River.

  Prior to the October 24, 2017 wastewater inspection, to which this inspection report pertains, the Ministry last inspected the Wawa Sewage Lagoons on October 22, 2012, 2012.

  The October 24, 2017 wastewater inspection included: a physical inspection of the wastewater treatment equipment and facilities; interview with the Municipality; and, a review of relevant documents from the period of January 1, 2017 to the date of inspection (herein referred to as the "inspection review period"). An assessment of the Wawa Wastewater Treatment Facility's operational performance was also undertaken by the Ministry, based on the information reported by the Municipality in the 2016 Annual Performance Report submitted to the Ministry.

  This October 24, 2017 inspection was focused on the sewage, but did not include an assessment of compliance with any air related approvals that exist for the site. Physical inspections of the outstations, i.e. sewage pumping stations, were also not conducted during this treatment plant inspection.

  Representatives from the Municipality of Wawa present during the inspection included Corey Stainthorpe, Director of Infrastructure Services, and Mac Liard, Plant Operator.

Authorizing/Control Documents

- **The owner had a valid Environmental Compliance Approval for the sewage works.**

  Environmental Compliance Approval # 0752-ADXQUC, issued October 12, 2016 is considered the main approval governing the use and operation of the Wawa Sewage Lagoons, and will herein be referred to and referenced as the Environmental Compliance Approval or the ECA for the purposes of this inspection report.

Capacity Assessment

- **The annual average daily flow was not approaching the rated capacity of the sewage works**

  According to the ECA, the Wawa Sewage Lagoons has a rated capacity of 4,300 m3/day.

Capacity Assessment

Based on the information contained in the 2016 Annual Performance Report, the Wawa Sewage Lagoons reportedly treated and average daily flow of 2411 m3/d during the 2016 operating year, representing approximately 55.5% of the rated capacity. During the inspection review period in 2017, flows into the plant appeared to be fairly consistent with 2016 results.

- **The owner of the sewage works had prepared a written statement certified by a Professional Engineer confirming that the proposed works were constructed in accordance with the Environmental Compliance Approval.**

  The Wawa Sewage Lagoons underwent a significant upgrade just prior to the current inspection. This upgrade included a new lagoon aeration system. As part of the inspection the Municipality provided a written statement from Kresin Engineering Corporation indicating that the proposed works were constructed in accordance with the Environmental Compliance Approval.

- **Flow measuring devices were installed, calibrated and maintained in accordance with the requirements of the Environmental Compliance Approval.**

  Condition 9(6) of the ECA, requires the Municipality to install and maintain (a) continuous flow measurement device(s), to measure the flowrate of the influent to or effluent from the Sewage Treatment Plant with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring devices, and record the flowrate at daily frequencies.

  To comply with this condition, the Municipality has installed a Miltronics Open Channel Monitor to measure flow into the works. The Facility ensures the flow measuring devices are calibrated once annually at a minimum. The Municipality has retained Metcon Sales & Engineering Ltd. to calibrate the flow meter. Records indicated that the flow monitoring equipment was most recently calibrated on October 12, 2017. The calibration records confirm that the flow measuring devices are being calibrated/verified for the entire design range of the flow measuring devices.

Treatment Processes

- **All monitoring equipment other than flow monitoring devices were installed, calibrated and maintained in accordance with any Environmental Compliance Approval.**

  Condition 8(1) of the ECA requires the Municipality to exercise due diligence in ensuring that, at all times, the works, and related equipment and appurtenances used to achieve compliance with the terms and conditions of the ECA are properly operated and maintained. Condition 8(2)(d) of the ECA also requires the operations manual to include procedures for the inspection and calibration of monitoring equipment.

  For compliance monitoring purposes associated with effluent pH and dissolved oxygen, the Municipality uses a portable pH meter. The pH meter is calibrated/verified, in-house on a monthly basis, following manufacturer's recommendations.

- **The owner had ensured that all equipment/components associated with the works was installed in accordance with the Environmental Compliance Approval.**

  The ECA references the following components of the sewage treatment system:

  Inlet Chamber:
  - A 375 mm diameter influent sewer and one (1) inlet chamber equipped with basket screen discharging to aerated lagoon Cell No. 1;

  Aerated Lagoon Cells:
  - Aerated lagoon Cell No.1 with a storage volume of approximately 38,040m3, discharging to aerated lagoon Cell No.2;

Treatment Processes

- Aerated lagoon Cell No.2 with a storage volume of approximately 36,600 m3, discharging via an effluent chamber to polishing lagoon Cell No.3;
- One (1) recirculation pump located in the effluent chamber of Cell No.2, rated at 22.6 L/s at 7.9 m TDH, pumping effluent back to the inlet chamber;

Polishing Lagoon Cells:
- Polishing lagoon Cell No.3 with a surface area of approximately 8.1 ha and an operating depth of 1.4m, discharging to polishing lagoon Cell No.4;
- Polishing lagoon Cell No.4 with a surface area of approximately 8.1 ha and an operating depth of 1.4 m discharging to the final effluent chamber;

Phosphorus Removal:
- One (1) 18,400 L phosphorus removal chemical storage tank;
- Two (2) chemical metering pumps (one standby), each with a capacity of 7.0 L/h, with chemical dosing to the effluent chamber of aerated lagoon Cell No.2;

Effluent Outfall:
- One (1) Final Effluent chamber, equipped with an adjustable weir gate;
- One (1) 450 mm diameter effluent pipe, discharging through an outfall structure at the bottom of the Magpie River;

Including all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works,

The physical inspection of the Wawa Sewage Lagoons verified that, for the most part, all equipment appeared to have been installed and operating in accordance with the requirements of the ECA.

- **The sewage works effluent was essentially free of foreign substances on the day of the inspection.**

Effluent Quality and Quantity

- **The sewage works effluent sample results met the effluent objectives stated in the Environmental Compliance Approval.**

Condition 6(1) of the ECA establishes effluent quality objectives that the Municipality is obligated to use best efforts to meet on an ongoing basis. The objectives are to be used as a mechanism to promote continuous improvement in the operation of the works and to trigger corrective action proactively and voluntarily before environmental impairment occurs.

The ECA establishes the following effluent concentration objectives:
- CBOD5: < 20.0 mg/L;
- Total Suspended Solids: < 25 mg/L;
- Total Phosphorus: < 0.8 mg/L;

Condition 6(2) of the ECA requires the Municipality to use best efforts to maintain the pH of the effluent from the Sewage Treatment Plant within the range of 6.5 – 8.5, inclusive, at all times;

Based on the information contained in the 2016 Annual Performance Report, with the exception of pH, the Wawa Wastewater Treatment Facility reportedly generally met the effluent objectives set out in the ECA, during the 2016 operating year. During 2016, on several occasions pH values exceeded the limit value of 8.5 specified in the ECA. Records provided for this inspection confirm that the Wawa Wastewater Treatment Facility met the effluent limits and objectives set out in the ECA during the inspection review period of 2017.

Monitoring Requirements

- **All sewage works effluent sampling requirements prescribed by the Environmental Compliance Approval were met.**

  Condition 9(3) of the ECA, requires the final effluent sampling and monitoring be completed as follows:
  - Dissolved Oxygen, Weekly grab;
  - CBOD5: Weekly composite;
  - Total Suspended Solids: Weekly composite;
  - Total Phosphorus: Weekly composite;
  - Total Ammonia Nitrogen: Weekly composite;
  - E.Coli: Weekly grab;
  - Temperature: Weekly grab;
  - pH: weekly grab;
  - Unionized Ammonia: Calculated Weekly

  A letter issued on February 8, 2017 by Marnie Managhan exempted the Municipality from obtaining dissolved oxygen sampling due to health and safety concerns during the Winter of 2017 until late April, or until such time as the sampling could be safely accessed. Sampling was resumed on April 3, 2017.

  Sampling records reviewed indicate that the Municipality has ensured that the effluent monitoring was being conducted on, at a minimum, a monthly or weekly basis as specified by the ECA, and had those samples analyzed externally by a licenced laboratory. Results of all testing is tabulated on spreadsheets forming part of the record keeping mechanisms.

- **All sewage works influent (raw sewage) sampling requirements prescribed by the Environmental Compliance Approval were met.**

  Condition 9(3) of the ECA, requires the raw sewage influent sampling and monitoring be completed as follows:
  - BOD5: Monthly composite;
  - Total Suspended Solids: Monthly composite;
  - Total Phosphorus: Monthly composite;
  - Total Kjeldahl Nitrogen: Monthly composite;

  Sampling records were reviewed during the inspection indicate that the Municipality has ensured that the effluent monitoring was being conducted on a weekly basis, at a minimum, and had those samples analyzed externally by a licenced laboratory.

  Results of all testing is tabulated on spreadsheets forming part of the record keeping mechanisms.

- **The owner had maintained the monitoring records for the period prescribed by the Environmental Compliance Approval.**

  Condition 9(7) of the ECA requires the Municipality to retain, for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by the ECA.

  Records reviewed indicate that the Municipality has maintained records in accordance with the requirements of the ECA.

- **All exceedances of any prescribed parameters were reported in accordance with the Environmental Compliance Approval.**

  Condition 10(1) of the ECA requires the Municipality to report to the Water Supervisor or designate, any exceedance of the average concentration of any parameter specified in the Effluent Limits Condition orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedance.

Monitoring Requirements

Several pH exceedances were reported during the 2016 operating year while the facility was undergoing upgrades. These exceedances were generally reported to the Water Supervisor in accordance with the ECA.

Exceedances were not identified by the facility during the inspection review period of 2017.

Bypasses and Overflows

- **For all bypasses/overflows which occurred from the sewage treatment plant, samples were collected and analyzed in accordance with the Environmental Compliance Approval.**

  Condition 4(4) of the ECA requires the Municipality to use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the bypass and have it analyzed for parameters outlined in Condition 7 using the protocols specified in Condition 9, one at the beginning of the event and the second approximately near the end of the event, to best reflect the effluent quality of such bypass.

  During 2016, three partial by-passes of the primary treatment system of the lagoon were reported to the Spills Action Centre. These by-passes coincided with maintenance work being undertaken to upgrade the facility. Records reviewed indicate that sampling procedures outlined in the ECA were undertaken for these by-passes. There were reportedly no overflows or by-pass events reported to have occurred at the Wawa Sewage Lagoons during this inspection review period of 2017.

- **Notices and written reports of all bypasses/overflows were provided to the Ministry in accordance with the Environmental Compliance Approval.**

  Condition 4(3) requires the Municipality to submit bypass event reports to the Ministry's local office on a quarterly basis, no later than each of the following dates for each calendar year: February 14, May 15, August 14, and November 15. Event reports shall be in an electronic formal specified by the Ministry. In each event report the Municipality shall include, at a minimum, the following information on any events that occurred during the preceding quarter:
  a) The date of the event(s);
  b) the measured or estimated volume of the event(s);
  c) the duration of the event(s);
  d) the location of the event(s);
  e) the reason for the event(s); and
  f) the level of treatment the bypasses received and disinfection status of the same.

  Records reviewed indicated that the partial primary bypass events that occurred during construction of the upgrades to the facility during 2016 were reported to the Ministry.

  There were reportedly no overflows or by-pass events reported to have occurred at the Wawa Wastewater Treatment Plant during this inspection review period of 2017.

Biosolids Management

- **The facility has a program in place to manage biosolids.**

  During the inspection review period, biosolids were removed from Wawa Wastewater Treatment plant through the use of geotubes. Future removal of biosolids will be evaluated on as needed basis.

- **The records confirm that biosolids were transferred to a Ministry approved facility by Ministry approved haulers.**

  Sludge material was removed from aerated lagoon cell #1 at the Wawa Sewage Lagoons as part of an improvements project at the facility which took place during the Summer and Fall of 2016. When the sludge was

Biosolids Management

removed from the lagoon it was pumped into Geotube dewatering bags and left to dewater for a period of approximately 13 months. The dewatered material was hauled to the Wawa Municipal landfill. The General Contractor, Cecchetto & Sons Ltd., was responsible for hauling the dewatered material to the landfill.

Certification and Training

- **Only operators with the appropriate level of licence made adjustments to the wastewater treatment and collection system equipment.**

  The Wawa Wastewater Treatment Plant is a Class 1 Wastewater treatment facility, (Certificate # 489), that was issued May 19, 2009.

  The Municipality has ensured that all operators making adjustments to the process equipment possess the appropriate level of wastewater treatment certification. The Municipality has ensured that every operator employed in the facility holds a license applicable to wastewater treatment, in accordance with the requirements of section 4(1) of Ontario Regulation 129/04.

- **All operators have the appropriate level of training and or experience for the wastewater treatment and collection facilities in accordance with the requirements of the Environmental Compliance Approval.**

  Condition 8(4) of the ECA requires the Municipality to provide for the overall operation of the Wawa Wastewater Treatment facility with an operator who holds a licence that is applicable to that type of facility and is at the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

  The Municipality has ensured that operators possessing Class 1 Wastewater Certification are available to provide overall operation of the Wawa Class 1 Wastewater Treatment Facility.

- **The overall responsible operator had been designated for the wastewater treatment and collection works.**

  During the inspection it was observed that the Municipality has ensured that operators possessing Class 1 and 2 Wastewater Certification are available to serve as the overall responsible operator for the Wawa Class 1 Wastewater Treatment Plant.

  Records identifying the name of the individual serving in the capacity of ORO, are documented within facility logbooks on a daily basis. The Township has designated the operators who possess the appropriate level of certification to act as Operator-in-Charge (OIC) as required.

Logbooks

- **The logs and record keeping mechanisms for the sewage works complied with the record keeping requirements.**

  A review of the Facility Logbook confirmed that entries were made, by the operator-in-charge, of all adjustments made to the treatment processes.

Operations Manuals

- **The operations and maintenance manuals met the requirements of the Environmental Compliance Approval.**

  Condition 8(2) of the ECA requires that the Municipality prepare an operations manual that includes the following information:
  - Operating procedures for routine operation of the Works;
  - Inspection programs, including frequency of inspection, for the Works and the methods or test employed to detect when maintenance is necessary;

Operations Manuals

- Repair and maintenance programs, including the frequency of repair and maintenance for the Works;
- Procedures for the inspection and calibration of monitoring equipment;
- A spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and
- Procedures for receiving, responding and recording public complaints, including recording any follow-up actions

A review of the operations manual was reviewed during the inspection. The operations manual for the facility complied with the requirements specified in the facility's ECA.

- **The operations and maintenance manuals contained up-to-date plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

  Section 20 of Ontario Regulation 129/04 requires that the Municipality ensures that up to date operations and maintenance manuals, including plans, drawings and process descriptions, be available to operators and maintenance personnel in the facility to ensure the safe and efficient operation of the works.

  Up to date operations and maintenance manuals were observed to be on site at the time of the inspection.

Contingency/Emergency Planning

- **For Lagoon Systems, the owner is conforming with the freeboard and berm conditions in the MOE Design Guidelines for Sewage Works.**

  The Wawa Sewage Lagoons appeared to have sufficient freeboard to conform to the MOE Design Guidelines for Sewage Works.

- **Spill containment was provided for the process chemicals and/or standby power generator fuel.**

  Adequate spill containment was observed to be on site during the site inspection.

- **The owner had provided security measures for the facility.**

  The Wawa Sewage Lagoons are fully enclosed by a chain link fence.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Not Applicable

SIGNATURES

Inspected By:

Scott Steeves

Signature: (Provincial Officer)

Reviewed & Approved By:

Jatinbhai Patel

Signature: (Supervisor)

Review & Approval Date:

MARCH 26, 2018

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

Appendix G

Kresin Engineering

Lagoon Sludge Survey

Municipality of Wawa
Sewage Treatment Facility

Sewage Lagoons Sludge Survey Report

July 2022-R1
KEC Ref: 2255

Prepared by:

KRESIN
Engineering Corporation

Table of Contents

Appendices

1 Scope and Purpose

The purpose of this report is to present the results of the July 2022 sludge survey of the four lagoon cells at the Wawa sewage treatment facility. Following completion of a hydrographic survey, the volume of accumulated sludge in each lagoon cell was determined.

2 Background

The Wawa sewage treatment facility is owned and operated by the Municipality of Wawa and is located on Golf Course Road. Consisting of two aerated cells constructed in 1986-87 followed by two polishing cells constructed in 1963 (the original waste stabilization lagoons), the aeration system including blowers, aerators and ancillary equipment was replaced in 2016. Aerated cells 1 and 2 each have a surface area of approximately 12,000m^2 and polishing cells 3 and 4 each have a surface area of approximately 81,000m^2. Effluent from the sewage treatment facility discharges from Cell 4 into the Magpie River through an outfall structure located in the river. An aerial photo of the facility is presented below in Figure 1.

Figure 1: Wawa Sewage Treatment Facility Aerial Photo

The facility operates under Ministry of the Environment and Climate Change (MECP) Environmental Compliance Approval (ECA) number 0752-ADXQUC, issued on October 12, 2016. Condition 10. (4) g. of the ECA requires the annual performance report to include information regarding the amount of accumulated sludge in each lagoon cell. The ECA states that the sludge volume is to be measured every 5 years and estimated in the interim years.

3 Methodology

Kresin Engineering Corporation conducted the sludge survey at the Wawa Sewage lagoons on July 12 to July 15, 2022. Surveys of the sludge surface in each lagoon cell were conducted using high accuracy GPS survey equipment together with a dual frequency echosounder transducer mounted to a 14' aluminum boat. The data was analyzed using Autodesk topographic software.

4 Survey Results and Summary

Utilizing the survey data, 3-dimensional models were created using Autodesk topographic software and sludge volumes were calculated for each cell. Table 1 presents the total calculated sludge volume in each cell for the surveys conducted on 2022 and 2017, as well as the volume of sewage accumulated since during period of time. Sludge distribution in each cell is shown graphically in Figures 2, 3 and 4, in Appendix A.

Table 1: Sludge Volume Summary

Location	Accumulated Sludge Volume (m^3)		Volume Change (m^3)
	2022	2017	
Cell 1	20,637 m^3	6,791	13,846
Cell 2	15,568 m^3	2,473	13,095
Cell 3	47,544 m^3	32,986	14,558
Cell 4	34,658 m^3	26,112	8,546

From analysis and review of the survey data:

1. The accumulated sludge in cell 1 is fairly evenly distributed throughout the cell, with an average depth of 2.05m.
2. The sludge depth in cell 2 varies between 0.3m and 2.4m with and average sludge depth of 1.51m.
3. Sludge depth in Cell 3 averages 0.67m with local areas of greater accumulation along the east and west limits of the cell.
4. Sludge is fairly evenly distributed throughout cell 4, with some slight sludge accumulation towards the northeast end. The average sludge depth of cell 4 is 0.52m.

Sludge distribution within each Cell was similar to that observed in 2017.

Areas within the survey limits that are not shaded (i.e. white areas), were either caused by invalid echosounder points and/or the area was overgrown with vegetation (eg. duckweed) impeding equipment functionality. Despite these data limitations, and in comparison to estimates developed applying MECP typical sludge generation rates, the survey results are felt to be reliable and to present a reasonable estimate of accumulated sludge volumes.

5 Closure

The information and data presented in this report are, to the best of our knowledge, complete and accurate.

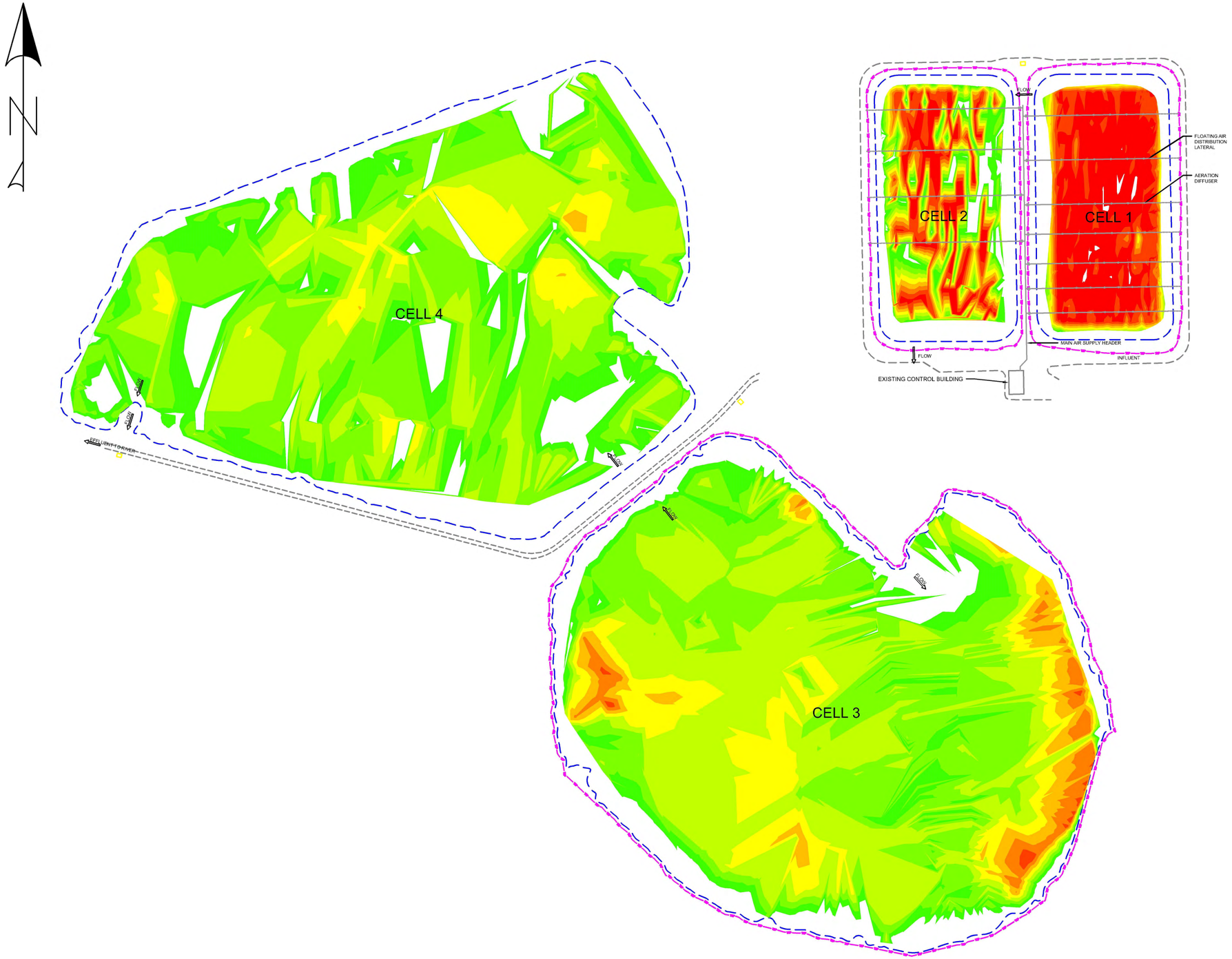
To ensure compliance with condition 10. (4) g. of the facility's ECA, the Municipality is required to conduct another sludge survey before December 31, 2027 and present the results in the 2027 Annual Sewage Performance Report. Further to this, for each interim year, the Municipality must include in their Annual Sewage Performance Reports an estimated volume of the accumulated sludge in each lagoon cell.

Should further information or clarification be required, please do not hesitate to contact our office.

This report respectfully submitted,
Kresin Engineering Corporation

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

APPENDIX A



SLUDGE DEPTH

DEPTH RANGE (m)	COLOUR
0.00 to 0.30	
0.30 to 0.60	
0.60 to 0.90	
0.90 to 1.20	
1.20 to 1.50	
1.50 to 1.80	
1.80 to 2.10	
2.10 to 2.40	

LEGEND

- EDGE OF WATER
- EDGE OF GRAVEL
- TOP — TOP OF SLOPE
- TOE — TOE OF SLOPE

NOTES:

No	DESCRIPTION	DATE	INITIAL

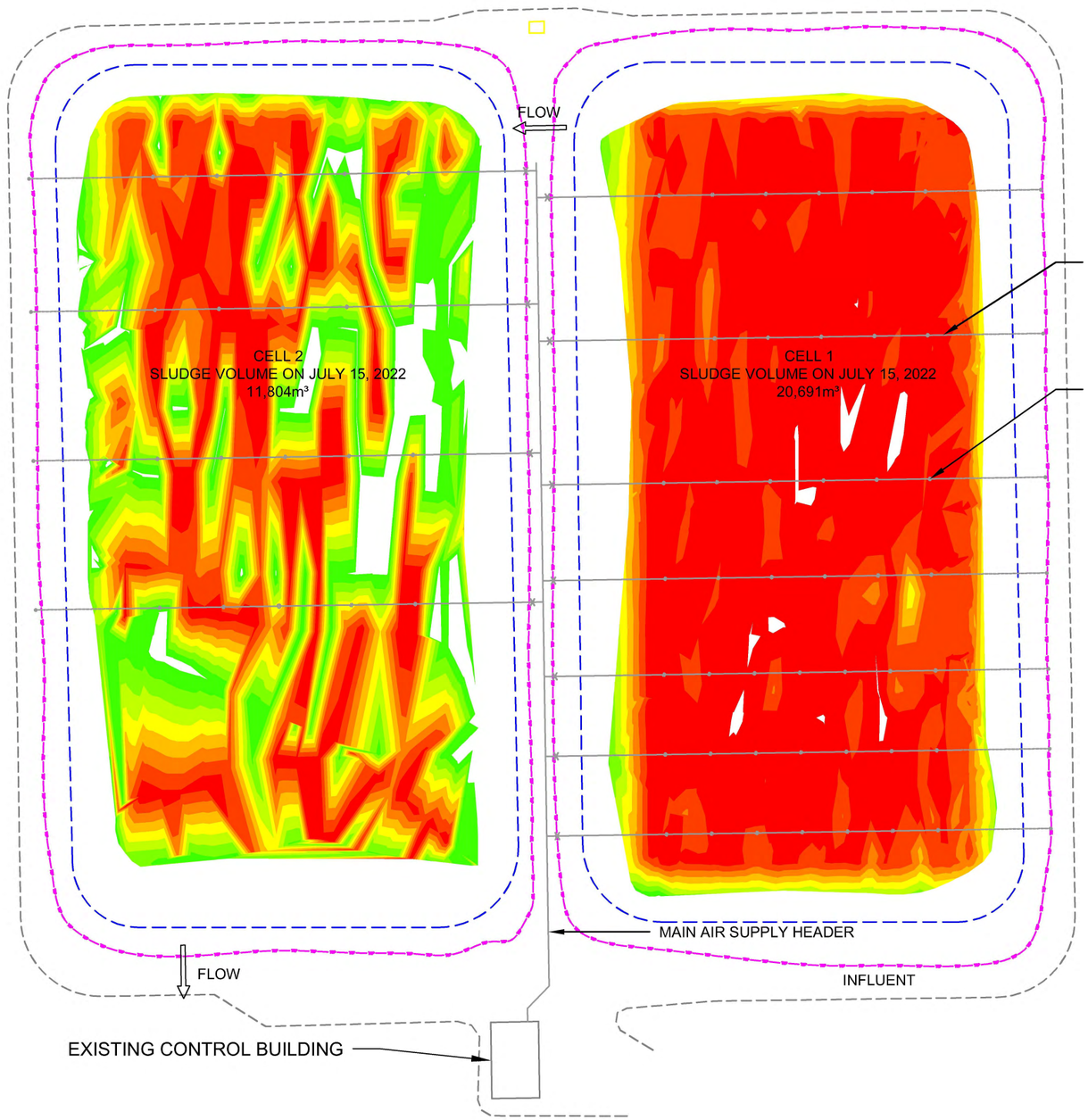
REVISIONS

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4000

SCALE	1:500
CHK	M. KRESIN
DATE	July 2022
DWG.	P. GODBOUT
GEO BM	
FILE	2255.01

WAWA LAGOON SLUDGE SURVEY
SITE PLAN

DRAWING NO.
1



N

SLUDGE DEPTH	
DEPTH RANGE (m)	COLOUR
0.00 to 0.30	
0.30 to 0.60	
0.60 to 0.90	
0.90 to 1.20	
1.20 to 1.50	
1.50 to 1.80	
1.80 to 2.10	
2.10 to 2.40	

LEGEND

- EDGE OF WATER
- EDGE OF GRAVEL
- TOP — TOP OF SLOPE
- TOE — TOE OF SLOPE

NOTES:

No	DESCRIPTION	DATE	INITIAL

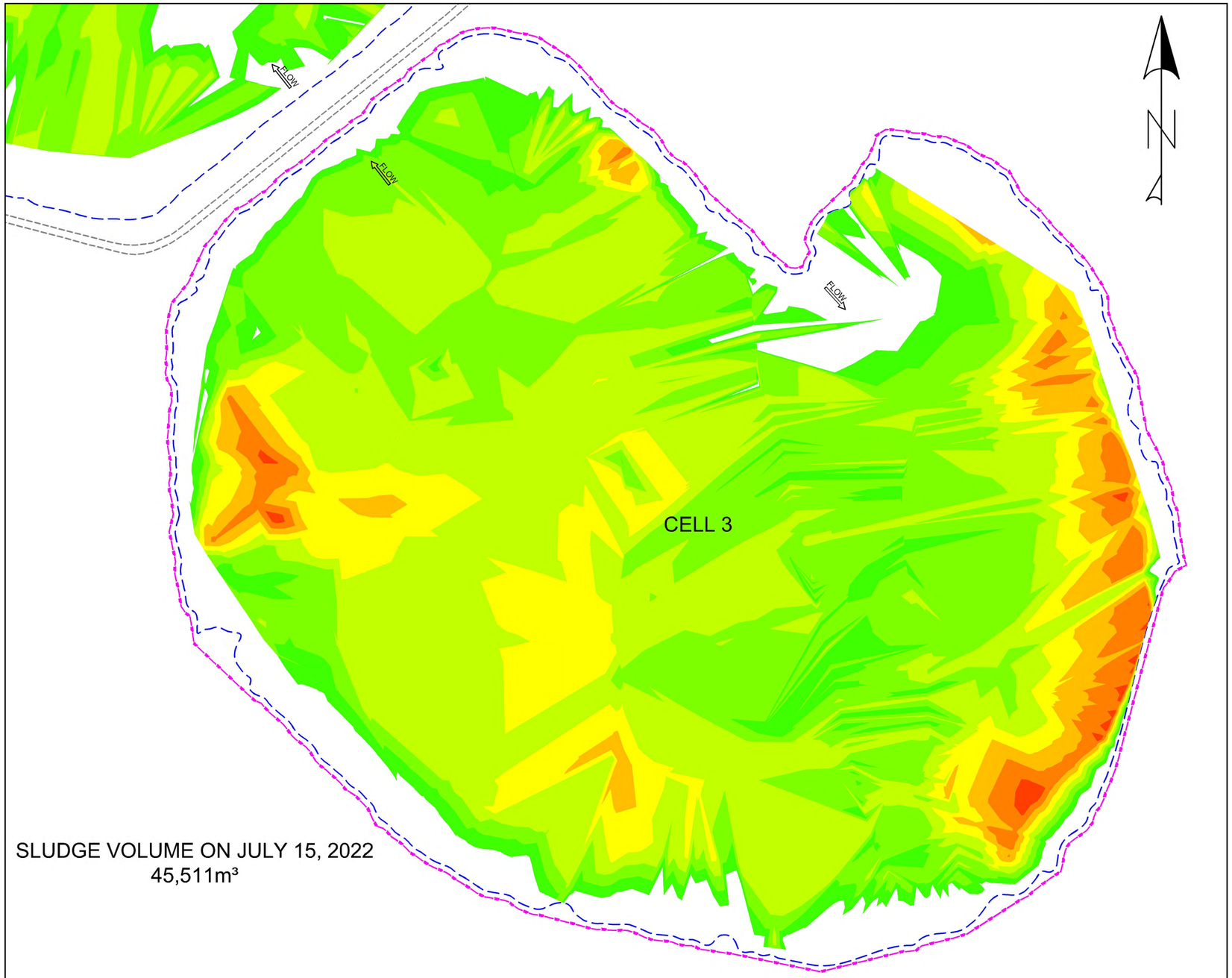
REVISIONS

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4000

SCALE	1:500
CHK	M. KRESIN
DATE	July 2022
DWG.	P. GODBOUT
GEO BM	
FILE	2255.01

WAWA LAGOON SLUDGE SURVEY
CELLS 1 & 2

DRAWING NO.
2



SLUDGE VOLUME ON JULY 15, 2022
45,511m³

SLUDGE DEPTH	
DEPTH RANGE (m)	COLOUR
0.00 to 0.30	
0.30 to 0.60	
0.60 to 0.90	
0.90 to 1.20	
1.20 to 1.50	
1.50 to 1.80	
1.80 to 2.10	
2.10 to 2.40	

LEGEND

- EDGE OF WATER
- EDGE OF GRAVEL
- TOP — TOP OF SLOPE
- TOE — TOE OF SLOPE

NOTES:

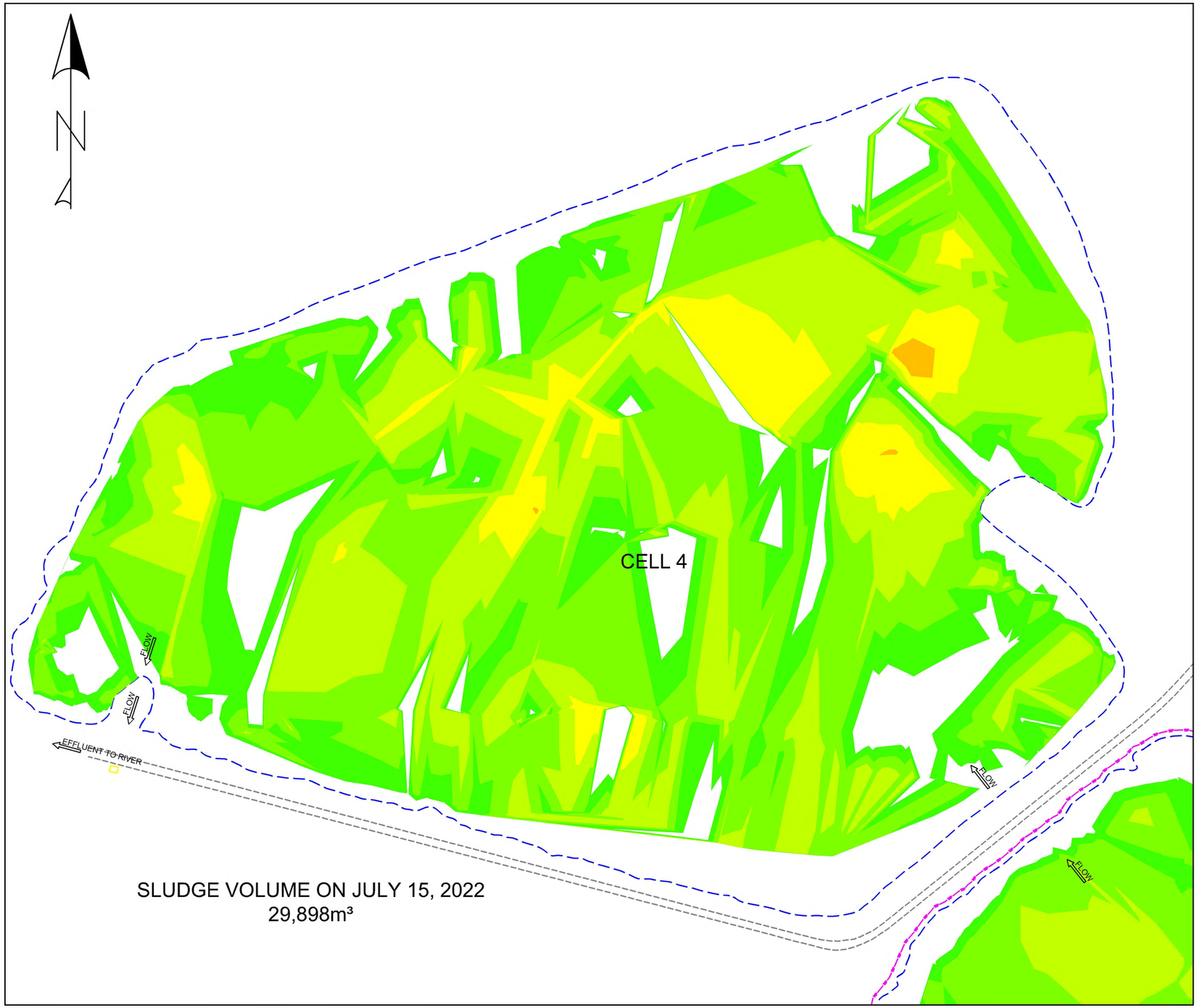
No	DESCRIPTION	DATE	INITIAL
	REVISIONS		

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

SCALE	1:750
CHK	M. KRESIN
DATE	July 2022
DWG.	P. GODBOUT
GEO BM	
FILE	2255.01

WAWA LAGOON SLUDGE SURVEY
CELL 3

DRAWING NO.
3



SLUDGE VOLUME ON JULY 15, 2022
29,898m³

SLUDGE DEPTH	
DEPTH RANGE (m)	COLOUR
0.00 to 0.30	
0.30 to 0.60	
0.60 to 0.90	
0.90 to 1.20	
1.20 to 1.50	
1.50 to 1.80	
1.80 to 2.10	
2.10 to 2.40	

LEGEND

- EDGE OF WATER
- EDGE OF GRAVEL
- TOP — TOP OF SLOPE
- TOE — TOE OF SLOPE

NOTES:

No	DESCRIPTION	DATE	INITIAL

REVISIONS

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario (705) 949-4000

SCALE	1:750
CHK	M. KRESIN
DATE	July 2022
DWG.	P. GODBOUT
GEO BM	
FILE	2255.01

WAWA LAGOON SLUDGE SURVEY
CELL 4

DRAWING NO.
4