



Ontario Clean Water Agency Agence Ontarienne Des Eaux

March 31, 2023

John Ritchie, Water Compliance Supervisor
Ministry of the Environment, Conservation and Parks
3rd floor, 101 17th Street East
Owen Sound, Ontario
N4K 0A5

RE: 2022 Annual Performance Report, Requirement for Tobermory Sewage Treatment System under Certificate of Approval (C of A) 3-0046-93-006 dated February 24, 1993

Dear Mr. Ritchie,

The Ontario Clean Water Agency entered into an agreement with the Municipality of Northern Bruce Peninsula to operate and maintain the Tobermory Sewage Treatment System, effective July 1, 2009.

Please see attached for the 2022 Annual Performance Report for the Tobermory Sewage Treatment System which covers the reporting period of January 1, 2022 to December 31, 2022. This report was completed in accordance with the requirements set out in condition 15.a. to i. of C of A 3-0046-93-006.

Should you require further clarification of information regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Frigault'.

Leo-Paul Frigault
Senior Operations Manager – Grey Bruce Hub
Ontario Clean Water Agency
Georgian Highlands Region
Lfrigault@ocwa.com



ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

TOBERMORY

SEWAGE TREATMENT FACILITY

ANNUAL PERFORMANCE REPORT

For the period of
JANUARY 1, 2022 TO DECEMBER 31, 2022

Prepared by the Ontario Clean Water Agency
For the Municipality of Northern Bruce Peninsula

1. System Description

The Tobermory Sewage Works System in the Municipality of Northern Bruce Peninsula (former Township of St. Edmunds) comprises a wastewater treatment plant and one sewage pumping station. The wastewater generated within the collection area of Tobermory is collected into the sewer system and pumped to the wastewater treatment plant by way of a 150 mm forcemain. The wastewater treatment plant consists of two aerated cells, one storage cell, two exfiltration ponds and one overflow cell.

The wastewater treatment plant contains two (2) aerated lagoons cells each with a capacity of of 10,800 m³. The aeration provided is tapered coarse bubble, diffused aeration. The aeration Cell #2 has a quiescent settling zone to permit effluent clarification. The effluent from the aeration Cell #2 can be recycled to aeration Cell #1, can be transferred to storage Cell #1 for winter storage, or can be transferred to the exfiltration Cells #2 or 3 during summer operations. The exfiltration cells have a combined minimum rated capacity of 317 m³/day, and each cell has approximately 13,750 m² of surface area. There is one (1) back-up exfiltration cell with a minimum rated capacity of 625 m³/d and approximately 21,875 m² surface area. To provide coarse bubble diffused aeration for the two aerated cells, the plant is provided with one duty and two standby blowers, each rated with a firm capacity of 193 L/sec at approximately 38 kPa.

The sewage pumping station (Little Tub Harbour Pumping Station), is located near the harbor and has two submersible pumps each rated at 18.3 L/sec capacity at 50.5 m TDH. The wet well has a normal operating volume of 5.7 m³. Due to its location near the harbour, the sewage pumping station wet well is provided with an odour control activated carbon adsorption unit with a capacity of 188.8 L/sec, for adsorbing hydrogen sulphide gas emissions from the wet well. The pumping station is also equipped with a 150-kW diesel generator set for providing emergency power for the sewage pumps. An overview of Tobermory Sewage Treatment System can be found in Table 1 and a summary of the monitoring program can be found in Table 2.

Table 1. Tobermory Sewage Treatment System Overview

Facility Name	Tobermory Sewage Treatment System
Facility Type	Lagoon
Plant Classification	II
Works Number	120001577
Design Capacity	625 m ³ /day
Receiving Water	None
Certificate of Approval	3-0046-93-006 (Sewage Treatment System)
	3-0310-82-917 (Groundwater Monitoring)
	8-1063-94-006 (Air)

Table 2. Tobermory Sewage Treatment System Monitoring Program

Source	Parameter	Frequency	Method
Influent	Flow (m ³)	Daily	Flowmeter
Secondary Aeration Cell Effluent	BOD ₅ , SS, TP, TKN, NH ₃ +NH ₄ (N), Nitrate, Nitrite	Monthly – March, June, July, August and October	External analysis
Aeration Cells	pH, Dissolved Oxygen	Weekly (from May – September)	In-House
Groundwater Wells	Alkalinity, Conductivity, Free Ammonia, Phenols, pH, Chloride, Sulphate, Nitrite, Magnesium, Iron, Nitrate, Calcium, Hardness, Sodium, DOC, Organic Nitrogen, TKN, Dissolved Reactive Phosphorous *, Total P*. (* = Shallow Wells Only)	Semi-Annual in May and October (for all 30 wells) Annual in August (for OW-6S, OW-6I, OW-6D, OW-7S, OW-9S, OW-9I, OW-9D, OW-10S, OW-11S, OW-12S)	External analysis
Ground Water Wells	Aluminum, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Zinc	Every 3 years in October	External Analysis

2. Monitoring and Compliance Reports

As per Section 15a. of C of A 3-0046-96-006, *a summary of all monitoring and compliance reports submitted in the reporting period, including an overview of the success and adequacy of the sewage treatment program* is required.

During the reporting period, the following reports were submitted:

- Discharge Data Report (Ministry of Environment, Conservation and Parks, MECP)

2.1 Discharge Data Report (MECP)

The Ontario Clean Water Agency (OCWA) has an agreement with the MECP to submit quarterly discharge data for all OCWA operated municipal sewage treatment facilities 45 days at the end of each quarter. Monitoring data is submitted via the Ministry of Environment Wastewater System (MEWS). The MECP has these reports stored in a shared location where MECP Inspectors can obtain and review them. There are no limits/objectives for discharge for the quarterly Discharge Data Report.

2.2 Adequacy of the Sewage Treatment Program

The current sewage treatment program provided effluent that was within the effluent objectives set out in the C of A for Suspended Solids and BOD₅ 100% of the time. Based on this, the current sewage treatment program is deemed adequate. OCWA continues to work towards staying within effluent objectives during each reporting period.

3. Monitoring and Analytical Data

As per Section 15b. of C of A 3-0046-96-006, *a comprehensive interpretation of all monitoring data and analytical data collected relative to the Tobermory Sewage Treatment System during the reporting period* is required.

All laboratory samples are analyzed by SGS Canada Inc., which is an ISO 17025 accredited laboratory. In-house readings (pH, DO, Temperature) are conducted for monitoring purposes by licensed operators using standardized methods. Calibrations and preventative maintenance are performed on facility equipment and monitoring equipment, see Section 10 for more details.

3.1 Sampling Frequency

Both groundwater and secondary aeration cell effluent are sampled on a regular basis. The sampling types and frequencies are summarized in Table 3, Table 4, Table 5 and Table 6.

All sampling frequencies either meet or exceed the requirements set out in Section 15 of C of A 3-0046-93-006.

Table 3. Complete Groundwater Monitoring Program– Sampling Frequencies for all 30 Observation Wells

Parameter	Frequency
Alkalinity	Semi-annually in May and October
Conductivity	Semi-annually in May and October
Free Ammonia	Semi-annually in May and October
Phenols	Semi-annually in May and October
pH	Semi-annually in May and October
Chloride	Semi-annually in May and October
Sulphate	Semi-annually in May and October
Nitrite	Semi-annually in May and October
Magnesium	Semi-annually in May and October
Iron	Semi-annually in May and October
Nitrate	Semi-annually in May and October
Calcium	Semi-annually in May and October
Hardness	Semi-annually in May and October
Sodium	Semi-annually in May and October
Dissolved Organic Carbon	Semi-annually in May and October
Organic Nitrogen	Semi-annually in May and October
Total Kjeldahl Nitrogen	Semi-annually in May and October
Phosphorous-Dissolved Reactive*	Semi-annually in May and October
Total Phosphorous*	Semi-annually in May and October
Aluminum	Every 36 Months in October
Barium	Every 36 Months in October
Cadmium	Every 36 Months in October
Chromium	Every 36 Months in October
Copper	Every 36 Months in October
Lead	Every 36 Months in October
Manganese	Every 36 Months in October
Zinc	Every 36 Months in October

Table 4. Limited Groundwater Monitoring Program– Sampling Frequencies for Wells 6S, 6I, 6D, 7S, 9S, 9I, 9D, 10S, 11S, 12S

Parameter	Frequency
Alkalinity	Annually in August
Conductivity	Annually in August
Free Ammonia	Annually in August
Phenols	Annually in August
pH	Annually in August
Chloride	Annually in August
Sulphate	Annually in August
Nitrite	Annually in August
Magnesium	Annually in August
Iron	Annually in August
Nitrate	Annually in August
Calcium	Annually in August
Hardness	Annually in August
Sodium	Annually in August
Dissolved Organic Carbon	Annually in August
Organic Nitrogen	Annually in August
Total Kjeldahl Nitrogen	Annually in August
Phosphorous-Dissolved Reactive*	Annually in August
Total Phosphorous*	Annually in August

Table 5. Effluent (Secondary Aeration Cell) Sample Monitoring – Sampling Frequencies

Parameters	Frequency
BOD ₅	Monthly, during March, June, July, August and October
Total Solids	Monthly, during March, June, July, August and October
Total Phosphorous	Monthly, during March, June, July, August and October
Total Kjeldahl Nitrogen	Monthly, during March, June, July, August and October
Ammonia Nitrogen	Monthly, during March, June, July, August and October
Nitrite	Monthly, during March, June, July, August and October
Nitrate	Monthly, during March, June, July, August and October
pH	In-house, weekly from May to September
Dissolved Oxygen	In-house, weekly from May to September

Table 6. Sludge Haulage Sample Monitoring – Sampling Frequencies

Parameters	Frequency
Total Solids	April, where sludge haulage is expected
Total Phosphorus	April, where sludge haulage is expected
Arsenic	April, where sludge haulage is expected
Cadmium	April, where sludge haulage is expected
Cobalt	April, where sludge haulage is expected

Chromium	April, where sludge haulage is expected
Copper	April, where sludge haulage is expected
Zinc	April, where sludge haulage is expected
Free Ammonia	April, where sludge haulage is expected
Nitrate – N	April, where sludge haulage is expected
Mercury	April, where sludge haulage is expected
Molybdenum	April, where sludge haulage is expected
Nickel	April, where sludge haulage is expected
Selenium	April, where sludge haulage is expected
Lead	April, where sludge haulage is expected

3.2 Effluent Limits & Effluent Objectives

There are no effluent limits specified in C of A 3-0046-93-006 for the Tobermory Sewage Treatment System. The effluent objectives as per Section 10 of C of A 3-0046-93-006 for the Tobermory Sewage Treatment System are:

Table 7. Effluent (Secondary Aeration Cell) Objectives for Tobermory Sewage Treatment System

Effluent Parameter	Average Monthly Concentration (mg/L)
BOD ₅	50
Suspended Solids	50

3.3 Comparison of Data to Effluent Objectives

Analytical and monitoring data for the Tobermory Sewage Treatment System is housed in OCWA’s data management system (WISKI). A comparison of the analytical results compared to the effluent objectives can be found in Table 8.

Table 8. Comparison of Effluent Objectives to Sampled Effluent (Secondary Aeration Cell)

	BOD ₅		Suspended Solids	
	Monthly Average Concentration (mg/L)	Within Objectives? (50.0 mg/L)	Monthly Average Concentration (mg/L)	Within Objectives? (50.0 mg/L)
March	11	Yes	13	Yes
June	23	Yes	33	Yes
July	8	Yes	9	Yes
August	13	Yes	16	Yes
October	7	Yes	11	Yes

3.4 Additional Monitoring Parameters

The following parameters do not have effluent limits or objectives but are monitored on a regular basis (see Section 3.1 for sampling frequency) as required by C of A 3-0046-93-006. Table 9, Table 10 and Table 11 summarizes the monitoring data for the reporting period.

3.4.1 Flows

The Tobermory Sewage Treatment Facility was designed to treat an average summer day flow of 625 m³/d. The total raw sewage flow including hauled septage volumes for 2022 was 57,627 m³ with an annual average daily flow of 136 m³/day which is 21.8% of the design capacity of the system. Total flows for 2022 have increased in comparison with 2021 but average daily flows for 2022 have decreased. A summary of the average daily flows on a monthly basis can be found in Table 9. For more detailed information regarding flows, refer to Appendix A.

Table 9. Summary of Average Day Flow by Month

Month	Average Day Flow (m ³)
January	48
February	49
March	111
April	124
May	156
June	194
July	250
August	248
September	179
October	126
November	62
December	78

Hauled septage volumes were added to the Sewage Pump Station total flow. According to item 11.b. of C of A 3-0046-93-006, “For the purposes of this Certificate and Subsection 107 (3) of the Ontario Water Resources Act, the introduction of sewage flows in excess of 625 m³/d for any consecutive period of time greater than one year is not approved under this Certificate”. The sewage flows for 2022 were less than 625 m³/d.

3.4.2 Aeration Cell Effluent

In addition to the parameters which have effluent objectives, Total Phosphorous, Total Kjeldahl Nitrogen (TKN), Ammonia-Nitrogen, Nitrite, Nitrate, pH and DO are monitored. Please refer to Table 10 and 11 for monitoring and analytical results.

Table 10. Average Monthly Aeration Cell Effluent Monitoring Laboratory Analysis Results

	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen (as N mg/L)	Ammonia+Ammonium (N) (mg/L)	Nitrite (mg/L as N)	Nitrate (mg/L as N)
March	5.23	6.8	5.2	0.03	5.87
June	6.44	15.4	13.7	0.13	0.34
July	6.05	38.3	36.9	0.53	0.54
August	6.10	40.8	38.5	0.75	0.45
October	7.72	2.9	0.2	0.23	5.57

Table 11. Aeration Cell In-House Monitoring - Average Monthly pH and DO

	pH				Dissolved Oxygen (mg/L)			
	Cell #1		Cell #2		Cell #1		Cell #2	
	Min	Max	Min	Max	Min	Max	Min	Max
May	5.88	7.04	6.63	8.64	1.96	6.90	9.08	12.24
June	7.02	7.22	7.42	7.67	0.67	1.70	0.95	4.60
July	6.78	7.35	7.42	7.64	0.15	1.30	1.71	3.26
August	6.66	7.35	7.38	7.64	0.42	0.98	7.38	7.64
September	7.13	7.56	7.41	7.54	0.42	3.83	1.02	3.14

For sewage, it is optimal if the effluent is between pH 6.0 and 9.5. The pH of Cell#1 and Cell#2 remained within the optimal range for the majority of the time. The DO range for Cell #1 and Cell #2 was between 0.15 and 8.64 mg/L in 2022 in comparison to 0.30 to 8.64 mg/L in 2021. Overall, the average DO in 2022 (3.40 mg/L) is higher than the average DO in 2021 (3.12 mg/L).

3.4.3 Groundwater Sampling Program

The complete and limited groundwater sampling of all on-site observation wells was completed in the Spring (May), Summer (August) and Fall (October) of 2022.

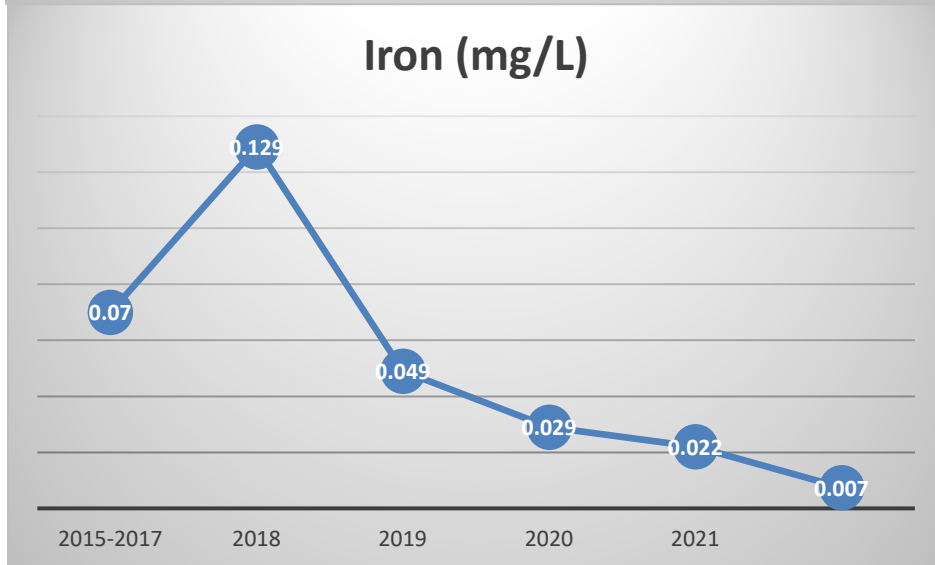
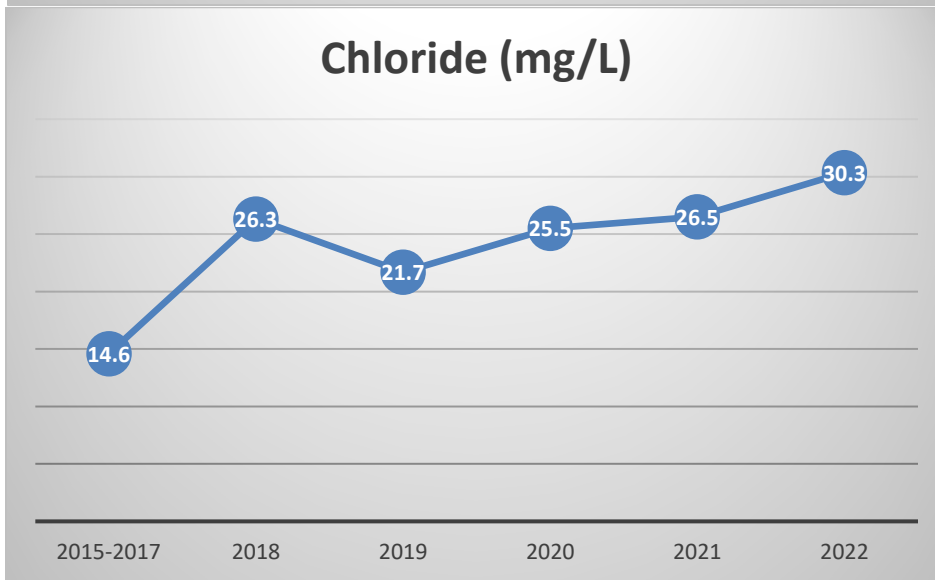
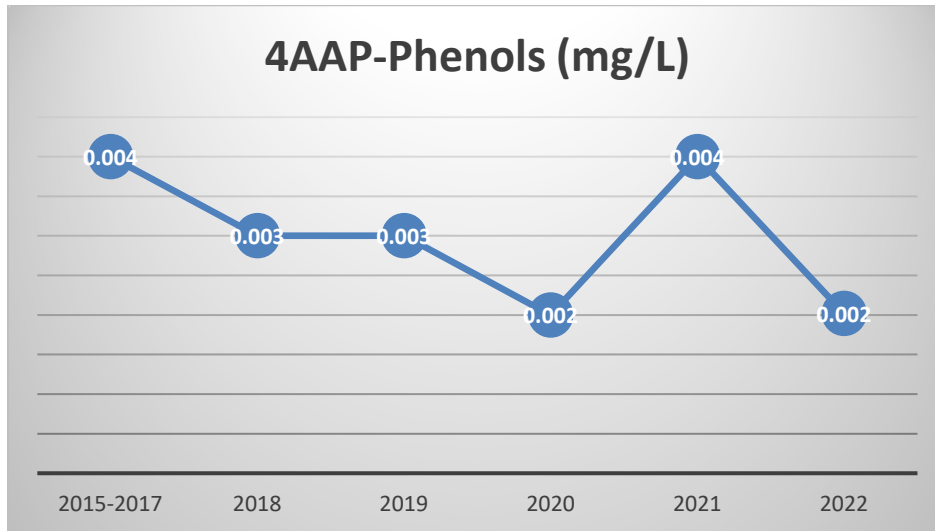
Table 12. Ground Water Sampling Program

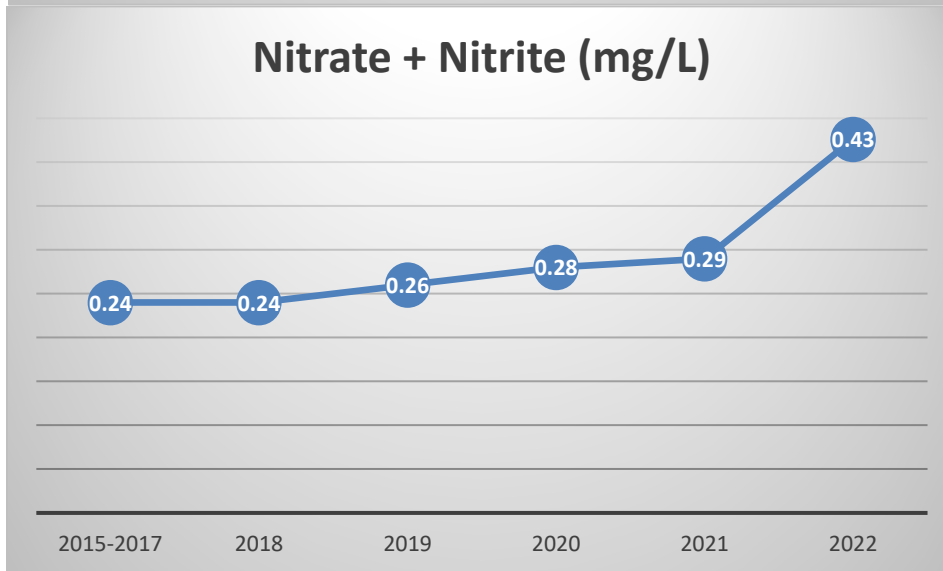
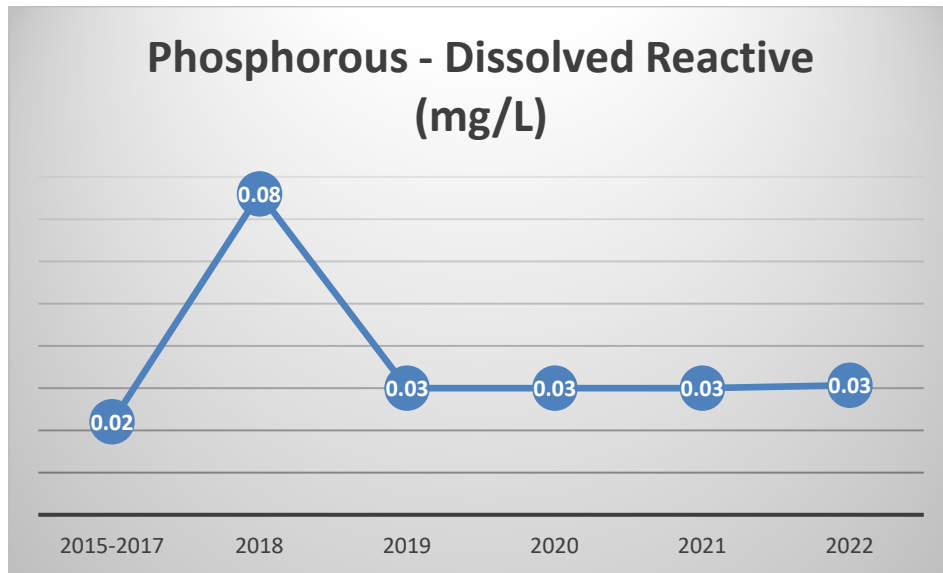
	Average						Minimum		Maximum	
	2022	2021	2020	2019	2018	2015-2017	2022	2021	2022	2021
4AAP-Phenols (mg/L)	0.002	0.004	0.002	0.003	0.003	0.004	0.002	0.002	0.003	0.049
Alkalinity (mg/L as CaCO3)	296	296	289.4	283	291	300	202	203	484	467
Calcium (mg/L)	79	81	78.9	76	88	82	50	40	144	146
Chloride (mg/L)	30.3	26.5	25.5	21.7	26.3	14.6	1	1	150	160
Conductivity (uS/cm)	618	626	597	586	582	599	342	397	997	1,030
Dissolved Organic Carbon (mg/L)	1.962	2	2	2	1.66	2	1	1	5	12
Iron (mg/L)	0.007	0.022	0.029	0.049	0.129	0.07	0.007	0.007	0.022	0.505
Phosphorous - Dissolved Reactive (mg/L)	0.03	0.03	0.03	0.03	0.076	0.022	0.03	0.03	0.04	0.03
Magnesium (mg/L)	24.6	23.5	23.4	23.2	24.7	24.9	15.1	11.0	35.4	35.1
Nitrate + Nitrite (mg/L)	0.43	0.29	0.28	0.26	0.24	0.24	0.06	0.06	2.25	2.20
Nitrite (mg/L)	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.19	0.11

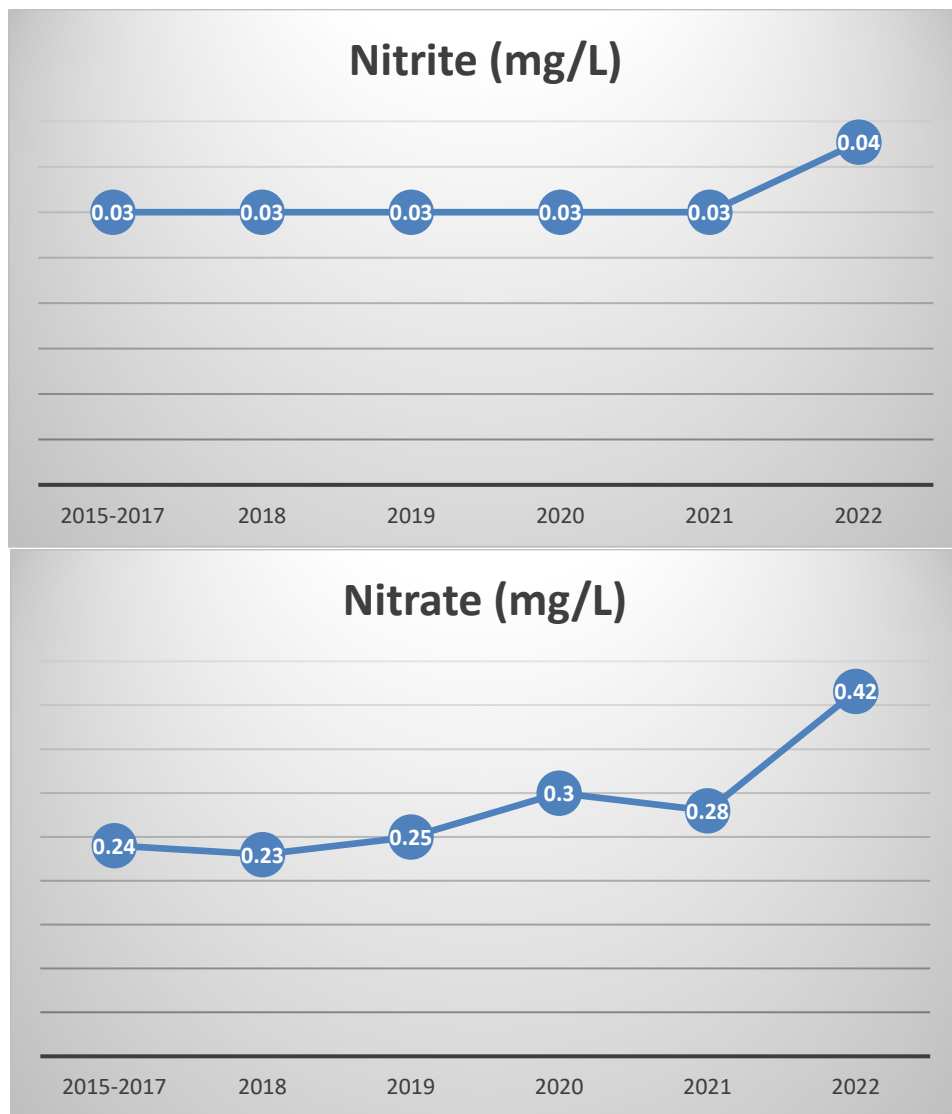
2022 Annual Performance Report
Municipality of Northern Bruce Peninsula: Tobermory Sewage Treatment Facility
C of A # 3-0046-93-006

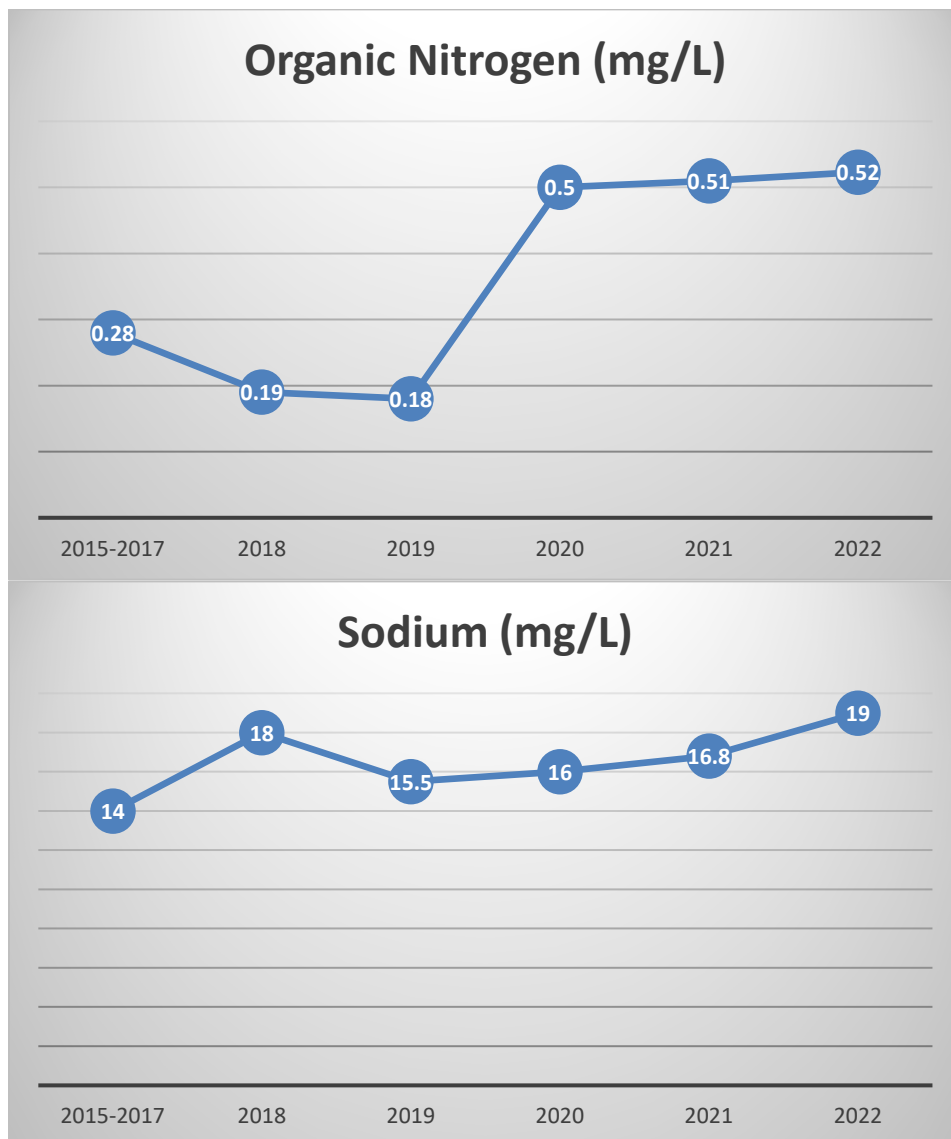
Nitrate (mg/L)	0.42	0.28	0.30	0.25	0.23	0.24	0.06	0.06	2.25	2.20
Organic Nitrogen (mg/L)	0.52	0.51	0.50	0.18	0.19	0.28	0.5	0.5	1.2	1.00
Sodium (mg/L)	19.0	16.8	16.0	15.5	18	14.0	0.52	0.47	78.8	75.8
Sulphate (mg/L)	17.0	13.0	13.0	11.2	11.7	12.1	2	2	49	39
Total Ammonia (mg/L)	0.18	0.30	0.10	0.22	0.12	0.12	0.1	0.1	1.1	2.5
Total Kjeldahl Nitrogen (mg/L)	0.58	0.64	0.50	0.51	0.52	0.50	0.5	0.5	2.4	2.2
Total Phosphorous (mg/L)	0.21	0.06	0.19	0.22	0.12	0.15	0.03	0.03	0.94	0.34
Hardness (dissolved) (mg/L as CaCO3)	299	298	293	285	322	309	205	166	506	502
Unionized Ammonia (mg/L)	0.005	0.012	0.003	0.004	0.003	0.002	0.001	0.001	0.039	0.132
pH	7.94	8.07	7.88	7.95	7.99	7.91	7.24	7.56	8.27	8.36

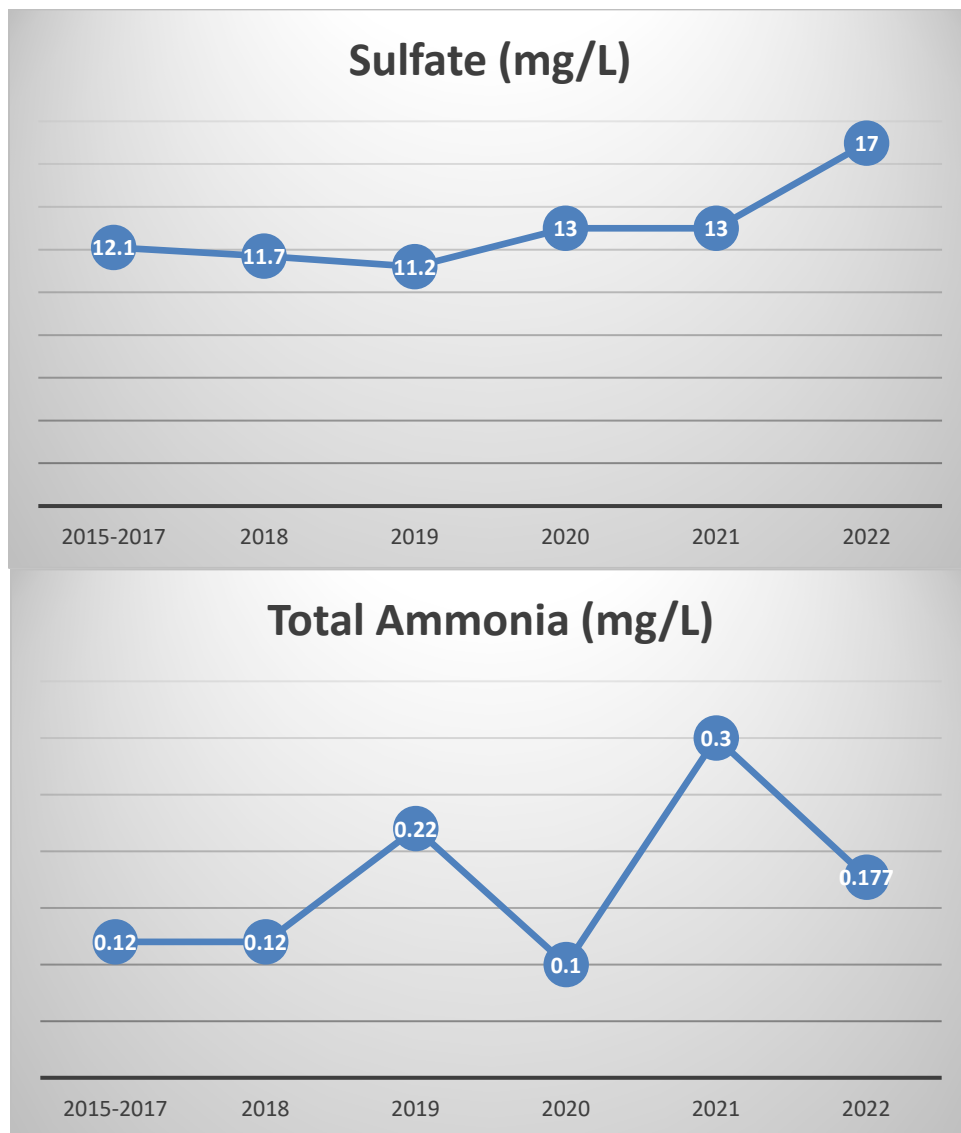
Ground Water Sampling graphs were made for every parameter that the average changed +/- 10% please see below. Further comprehensive interpretation of groundwater monitoring data is required in order to determine proximity of sites that produced parameter changes and if relation exists with other monitoring sites.

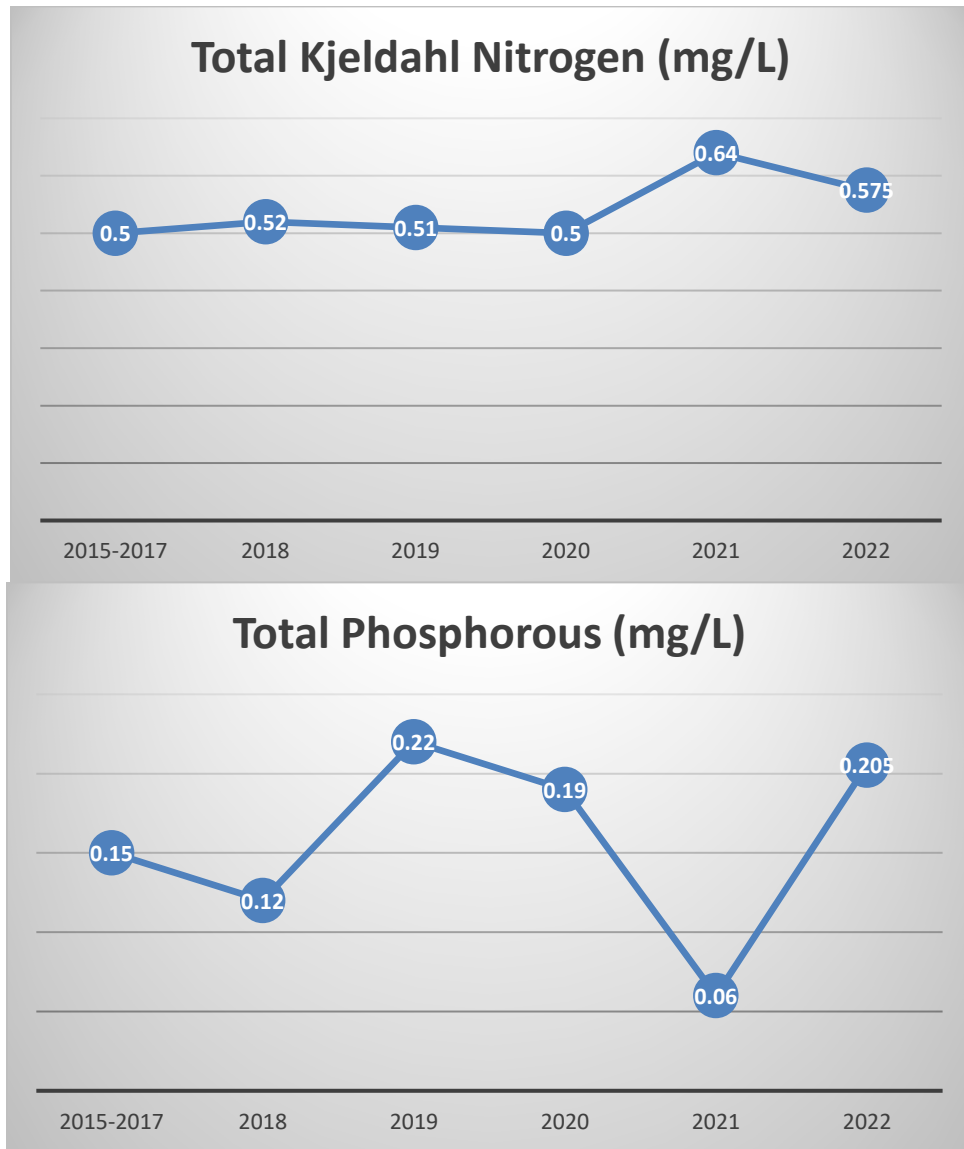












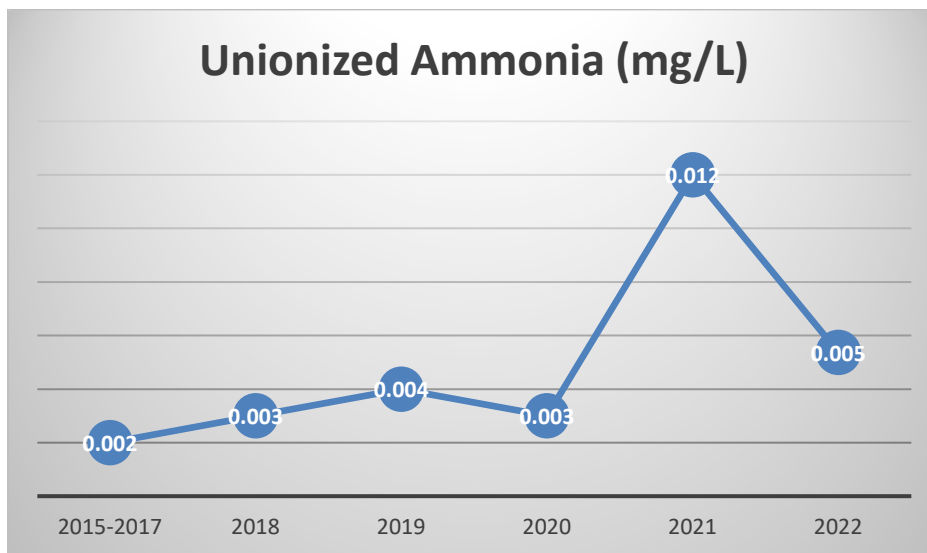


Table 13. Ground Water Sampling Program – 36 Month Sampling (October 2021)

	Minimum	Average	Maximum
Aluminum	0.001	0.001	0.004
Barium	0.007	0.017	0.042
Cadmium	0.000003	0.000009	0.000084
Chromium	0.00008	0.00011	0.00053
Copper	0.0002	0.0016	0.0162
Lead	0.00009	0.00009	0.00009
Manganese	0.00004	0.0870	0.843
Zinc	0.002	0.005	0.048

Refer to Appendix B for the laboratory analysis results for the groundwater sampling program.

4. Major Maintenance Activities

As per Section 15c. of C of A 3-0046-96-006, a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanisms or thing forming part of the facility is required.

During 2022, the following major maintenance activities were conducted:

- There were no major maintenance activities during the reporting period

5. Operating Challenges

As per Section 15d. of C of A 3-0046-96-006, a description of any operating problems encountered and corrective actions taken during the reporting period are to be identified.

There were no bypasses of raw sewage or spills at the Tobermory Sewage Treatment System or any associated pumping stations during the reporting period.

6. Proposed Alterations, Extensions or Replacements

As per Section 15e. of C of A 3-0046-96-006, *a summary of any proposed alteration, extension or replacement in the process or operations of the sewage treatment plant to be completed over the next reporting period which may require approval under the Ontario Water Resources Act (OWRA) is required.*

The following alterations, extensions/replacements are proposed for 2023, some of which may not require approval under OWRA:

- Sampling reduction request
- Lagoon cell sludge removal
- Generator annual inspection

7. Sludge Generation

As per Section 15f. of C of A 3-0046-96-006, *a tabulation of the volume of sludge generated in the reporting period and an outline of anticipated volumes to be generated over the next reporting period is required.*

Since the facility is a sewage lagoon system, accumulated sludge is currently being stored in lagoon cell #1. The lagoons have been de-sludged once since the existing facility was constructed and approximately 800 m³ of dewatered sludge was removed in October 2004.

A volume modeling and distribution survey was performed on July 23 & 24, 2020 of both Cells 1 and 2. The biosolids levels were recorded to be 10.62 inches for Cell 1 and 6.25 inches for Cell 2. The biosolids volumes were recorded to be 519.63 m³ for Cell 1 and 391.84 m³ for Cell 2. See Appendix E for the detailed reports.

As the 20 year mark has not been reached since the last lagoon cells cleanout, we suggested to postpone the lagoon cleanout exercise for at least two more years. Meanwhile, we suggest to have the entire sewer collection system flushed and video inspected in order to locate possible inflow or infiltration.

8. Sludge Handling

As per Section 15g. of C of A 3-0046-96-006, *an outline of the sludge handling methods and disposal areas to be utilized over the next reporting period are to be specified.*

Since the facility is a sewage lagoon system, sludge levels in the lagoons are monitored regularly and disposal is arranged when sludge storage has reached its limit. No disposal areas are expected to be utilized over the next reporting period.

9. Septage Receiving Works

In 2022, approximately 7,974 m³ (1,754,100 imperial gallons) of septage was received by the Tobermory Sewage Treatment. The septage was received from various sources including:

- Bruce Peninsula Septic Service

- Scott Septic Pumping
- Mountain Trout Camp

The total monthly volume of septage received can be found in Table 14. Detailed haulage volumes can be found in Appendix C.

Table 14. Total Volume of Septage Received in 2022

Month	Total Volume of Septage Received (m ³)
January	17.0
February	35.4
March	73.4
April	396.2
May	630.3
June	1,175.7
July	1,721.1
August	1,818.9
September	1,225.3
October	698.0
November	147.4
December	35.6

10. Calibration and Maintenance Procedures

As per Section 15.h. of C of A 3-0046-96-006, *an evaluation of the calibration and maintenance procedures conducted on all monitoring equipment is required.*

All in-house monitoring equipment is calibrated as per manufacturer’s recommendations. Monitoring and metering equipment is also calibrated by a third party on an annual basis. On June 15, 2022 Indus Controls calibrated the flow meter at the Tobermory Pump Station. In addition to sample analysis, preventative maintenance is scheduled for all equipment at the sewage treatment plant and pumping stations on at least a monthly basis. Maintenance activities were scheduled within the work management system (WMS), upon completion, operators record their time and close off the work order. All records for calibrations/ verifications can be found in Appendix D.

11. Modifications for Performance and Reliability

As per Section 15j. of C of A 3-0046-96-006 *an evaluation for the need for modifications to the Tobermory Sewage Treatment Facility to improve performance and reliability and to minimize upsets and bypasses is required.*

During the reporting period the Tobermory Sewage Treatment Facility met the effluent objectives 100% of the time. Based on this evaluation, modifications for performance and reliability are not needed at this time.



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix A

Performance Assessment Report

1132 TOBERMORY WASTEWATER TREATMENT FACILITY 120001577

	1/ 2022	2/ 2022	3/ 2022	4/ 2022	5/ 2022	6/ 2022	7/ 2022	8/ 2022	9/ 2022	10/ 2022	11/ 2022	12/ 2022	<--Total-->	<--Avg-->	<--Max-->	<-Criteria->
Flows																
Raw Flow: Total - Sewage Pumping Station m³/d	1,497.50	1,364.50	3,433.00	3,725.99	4,837.00	5,827.60	7,736.30	7,686.50	5,378.33	3,906.70	1,854.97	2,405.00	49,653.40			0.00
Raw Flow: Avg - Sewage Pumping Station m³/d	48.31	48.73	110.74	124.20	156.03	194.25	249.56	247.95	179.28	126.02	61.83	77.58		136.04		625.00
Raw Flow: Max - Sewage Pumping Station m³/d	57.50	74.00	211.00	176.00	272.75	237.60	266.50	327.00	224.50	189.50	85.00	216.00			327.00	0.00
Raw Flow: Count - Sewage Pumping Station m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Sewage Pumping Station mg/L	0.00	0.00	0.00	0.00	0.00	111.00	209.00	522.00	0.00	198.00	0.00	0.00		260.00	522.00	0.00
Percent Removal: BOD5 - Sewage Pumping Station %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Total Suspended Solids: TSS																
Raw: Avg TSS - Sewage Pumping Station mg/L	0.00	0.00	0.00	0.00	0.00	109.00	4,140.00	792.00	0.00	6,680.00	0.00	0.00		2,930.25	6,680.00	0.00
Percent Removal: TSS - Sewage Pumping Station %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Total Phosphorus: TP																
Raw: Avg TP - Sewage Pumping Station mg/L	0.00	0.00	0.00	0.00	0.00	4.07	38.80	24.50	0.00	21.20	0.00	0.00		22.14	38.80	0.00
Percent Removal: TP - Sewage Pumping Station %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Nitrogen Series																
Raw: Avg TKN - Sewage Pumping Station mg/L	0.00	0.00	0.00	0.00	0.00	45.10	104.00	130.00	0.00	64.20	0.00	0.00		85.83	130.00	0.00



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix B

Groundwater Sampling Program Laboratory Analysis
Results

Ontario Clean Water Agency - Request for Laboratory Services and CHAIN OF CUSTODY - GROUNDWATER (MAY&OCTOBER, EXTENDED)

Waterworks/Project # **120001577** C of C LIMS No: **MAY 13922**
 Facility Name **Tobermory Sewage Treatment Plant** Laboratory Section _____ Sample condition upon receipt _____
 Org. # **1132** Date Rec'd: **05/21/22** Time Rec'd _____ Initials: **nan**
 Quote # _____ Attached Parameter List No Yes Temperature Upon Receipt **19x3** °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment
 Requested Turnaround Time: _____ b App. 24-48 h 5-7d 7-10d Other _____ Specify: _____

Report to: Process & Compliance Tech (PCT) Data Transfer Contact: PCT Invoice To: Ontario Clean Water Agency Laboratory: SGS Lakefield Research Ltd
 Address: 18 Caroline Street Southampton, ON N0H 2L0 18 Caroline Street Southampton, ON N0H 2L0 18 Caroline Street Lakefield, ON K0L 2H0
 Telephone: 519-374-5782 519-374-5782 519-797-2561 705-652-2000
 Fax: (519) 797-3080 (519) 797-3080 (519) 797-3080 705-652-6365
 Email: kyoung@ocwa.com kyoung@ocwa.com apwesthighlands@ocwa.com carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	Bottles	Parameters																	Comments	Upload to OCWA			
					Alkalinity	Conductivity	Free Ammonia	Phenols	pH	Chloride	Sulphates	Nitrite	Magnesium	Iron	Nitrate	Calcium	Hardness	Sodium	DOC	Organic Nitrogen	TKN			Dissolved Reactive Phosphorus	Total Phosphorus	
Well	5S	- 10:10	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	5I	- 10:20	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	5D	- 10:30	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	9D	- 13:30	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	9I	- 13:10	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	9S	- 13:20	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	8I	- 13:45	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	8D	- 13:55	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	10S	- 14:40	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	11S	- 14:25	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	12S	- 09:55	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	1D	- 09:45	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	1I	- 09:40	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	6S	- 09:35	MAY 20 2022	Kit	DRY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	6D	- 09:30	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	6I	- 09:20	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	57	- 09:10	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	56	- 09:05	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	2S	- DRY	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	2I	- 08:55	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	2D	- 08:45	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	55	- 08:30	MAY 20 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	7S	- DRY	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	60	- 14:10	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	61	- 14:20	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	8S	- DRY	MAY 19 2022	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Sampler Name: **Billy Shearer** Sampler Signature: *Billy Shearer* Revision #6 Revised: 2021.05.21

rec'd. **608079399754** **608079399762** **608079399770** HC RTN 1130 *nan*



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OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

P.O. Box 760
Southampton, ON
N0H 2L0, Canada

Phone: 519-797-2561
Fax:pdf

Works #: 120001577
Project : PO#017018

07-June-2022

Date Rec. : 21 May 2022
LR Report: CA13922-MAY22

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	25: Well 2D-OW2-D (Well 9)	26: Well 55-OW55 (Well 11)	28: Well 60-OW60 (Well 14)	29: Well 61-OW61 (Well 15)
Sample Date & Time					20-May-22 08:45	20-May-22 08:30	19-May-22 14:10	19-May-22 14:20
Temperature Upon Receipt [°C]	---	---	---	---	19.0	19.0	19.0	19.0
Alkalinity [mg/L as CaCO3]	25-May-22	06:31	27-May-22	14:26	268	395	316	313
Conductivity [uS/cm]	25-May-22	06:31	27-May-22	14:26	510	658	935	772
pH [No unit]	25-May-22	06:31	27-May-22	14:26	7.74	7.94	7.53	7.76
Temperature @ pH [°C]	25-May-22	06:31	27-May-22	14:26	19.8	22.0	19.0	19.1
Organic Nitrogen [mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	28-May-22	14:36	30-May-22	14:51	< 0.001	0.002	< 0.001	< 0.001
Ammonia+Ammonium (N) [as N mg/L]	28-May-22	14:36	30-May-22	14:50	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	25-May-22	10:41	27-May-22	12:45	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-22	17:51	27-May-22	11:12	1	3	2	1
Phosphorus (total) [mg/L]	31-May-22	16:16	01-Jun-22	13:06	---	---	---	---
Phosphorus (dissolved reactive) [mg/L]	25-May-22	13:01	26-May-22	10:16	---	---	---	---
Chloride [mg/L]	06-Jun-22	10:55	06-Jun-22	15:27	1	< 1	150	68
Sulphate [mg/L]	06-Jun-22	12:10	06-Jun-22	15:27	21	< 2	49	29
Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	0.31	2.25	0.68
Nitrate + Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	0.31	2.25	0.68
Hardness (dissolved) [mg/L as CaCO3]	29-May-22	17:15	31-May-22	11:29	250	412	369	377
Magnesium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	24.2	21.8	25.4	31.2
Calcium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	60.1	129	106	99.6

OnLine LIMS

0002927045

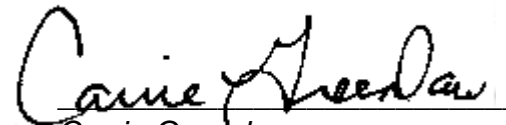


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Works #: 120001577
Project : PO#017018
LR Report : CA13922-MAY22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	25: Well 2D-OW2-D (Well 9)	26: Well 55-OW55 (Well 11)	28: Well 60-OW60 (Well 14)	29: Well 61-OW61 (Well 15)
Iron (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.007	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	24.9	0.80	63.7	34.7
Phosphorus (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.003	< 0.003	0.071	0.030

Note: Provincial un-ionized ammonia calculated from field pH and temperature provided on the chain of custody form.



Carrie Greenlaw
Project Specialist,
Environment, Health & Safety



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OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

07-June-2022

Date Rec. : 21 May 2022
LR Report: CA13922-MAY22

P.O. Box 760
Southampton, ON
N0H 2L0, Canada

Copy: #1

Phone: 519-797-2561
Fax:pdf

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Well 5S-OW5-S (Well 4)	6: Well 5I-OW5-I (Well 5)	7: Well 5D-OW5-D (Well 6)	8: Well 9D-OW9-D (Well 20)	9: Well 9I-OW9-I (Well 19)	10: Well 9S-OW9-S (Well 18)	11: Well 8I-OW8-I (Well 16)
Sample Date & Time					20-May-22 10:10	20-May-22 10:20	20-May-22 10:30	19-May-22 13:30	19-May-22 13:10	19-May-22 13:20	19-May-22 13:45
Temperature Upon Receipt [°C]	---	---	---	---	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Alkalinity [mg/L as CaCO3]	25-May-22	06:31	27-May-22	14:26	233	217	232	238	248	261	262
Conductivity [uS/cm]	25-May-22	06:31	27-May-22	14:26	782	824	846	437	477	443	484
pH [No unit]	25-May-22	06:31	27-May-22	14:26	8.17	7.70	8.17	8.26	8.24	8.15	8.04
Temperature @ pH [°C]	25-May-22	06:31	27-May-22	14:26	18.8	20.0	22.2	22.2	21.9	18.8	18.8
Organic Nitrogen [mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	28-May-22	14:36	30-May-22	14:51	0.006	0.009	0.028	0.004	0.005	<0.003	0.002
Ammonia+Ammonium (N) [as N mg/L]	28-May-22	14:36	30-May-22	14:50	0.1	0.5	0.4	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	25-May-22	10:41	27-May-22	12:45	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-22	17:51	27-May-22	11:12	3	4	3	< 1	2	2	1
Phosphorus (total) [mg/L]	31-May-22	16:16	01-Jun-22	13:06	0.17	---	---	---	---	< 0.03	---
Phosphorus (dissolved reactive) [mg/L]	25-May-22	13:01	26-May-22	10:16	< 0.03	---	---	---	---	< 0.03	---
Chloride [mg/L]	06-Jun-22	10:55	06-Jun-22	15:27	120	140	150	< 1	4	< 1	6
Sulphate [mg/L]	06-Jun-22	12:10	06-Jun-22	15:27	41	47	29	17	23	4	13
Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.03	0.19	0.04	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	0.75	1.46	0.31	< 0.06	< 0.06	< 0.06	0.12
Nitrate + Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	0.75	1.65	0.35	< 0.06	< 0.06	< 0.06	0.12
Hardness (dissolved) [mg/L as CaCO3]	29-May-22	17:15	31-May-22	11:29	262	246	257	241	241	255	282
Magnesium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	18.5	18.1	18.2	25.3	25.2	22.2	28.1
Calcium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	74.3	68.7	72.9	54.9	55.0	65.4	66.4
Iron (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.007	0.007	< 0.007	< 0.007	0.022	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	62.9	78.8	74.1	3.98	7.66	0.80	3.19
Phosphorus (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	0.004	0.033	0.006	< 0.003	0.710	< 0.003	< 0.003

OnLine LIMS

0002927035




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Works #: 120001577
Project : PO#017018
LR Report : CA13922-MAY22

Note: Provincial unionized ammonia calculated from field pH and temperature provided on the chain of custody form.



Carrie Greenlaw
Project Specialist,
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OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

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Phone: 519-797-2561
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Works #: 120001577
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07-June-2022

Date Rec. : 21 May 2022
LR Report: CA13922-MAY22

Copy: #1

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	12: Well 8D-OW8-D (Well 17)	13: Well 10S-OW10-S (Well 23)	14: Well 11S-OW11-S (Well 24)	15: Well 12S-OW12-S (Well 10)	16: Well 1D-OW1-D (Well 22)	17: Well 1I-OW1-I (Well 21)
Sample Date & Time					19-May-22 13:55	19-May-22 14:40	19-May-22 14:25	20-May-22 09:55	20-May-22 09:45	20-May-22 09:40
Temperature Upon Receipt [°C]	---	---	---	---	19.0	19.0	19.0	19.0	19.0	19.0
Alkalinity [mg/L as CaCO3]	25-May-22	06:31	27-May-22	14:26	277	202	354	268	265	395
Conductivity [uS/cm]	25-May-22	06:31	27-May-22	14:26	505	389	620	932	498	660
pH [No unit]	25-May-22	06:31	27-May-22	14:26	8.15	8.26	8.21	8.12	7.86	8.19
Temperature @ pH [°C]	25-May-22	06:31	27-May-22	14:26	18.7	19.1	21.7	22.2	19.3	22.3
Organic Nitrogen [mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	28-May-22	14:36	30-May-22	14:51	0.002	0.004	<0.004	<0.003	0.002	<0.004
Ammonia+Ammonium (N) [as N mg/L]	28-May-22	14:36	30-May-22	14:50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	25-May-22	10:41	27-May-22	12:45	< 0.002	< 0.002	< 0.002	0.003	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-22	17:51	27-May-22	11:12	< 1	3	2	3	< 1	1
Phosphorus (total) [mg/L]	31-May-22	16:16	01-Jun-22	13:06	---	0.22	< 0.03	< 0.03	---	---
Phosphorus (dissolved reactive) [mg/L]	25-May-22	13:01	26-May-22	10:16	---	< 0.03	< 0.03	< 0.03	---	---
Chloride [mg/L]	06-Jun-22	10:55	06-Jun-22	15:27	6	< 1	2	150	3	1
Sulphate [mg/L]	06-Jun-22	12:10	06-Jun-22	15:27	18	19	15	39	13	6
Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	< 0.06	1.24	1.49	0.07	< 0.06
Nitrate + Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	< 0.06	1.24	1.49	0.07	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	29-May-22	17:15	31-May-22	11:29	305	222	356	323	256	365
Magnesium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	28.2	22.1	31.2	21.2	24.9	29.4
Calcium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	75.7	52.4	90.9	94.4	61.4	97.5
Iron (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.007	< 0.007	< 0.007	0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	1.65	3.05	1.78	71.9	24.5	17.3
Phosphorus (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.003	< 0.003	< 0.003	< 0.003	0.026	2.47

OnLine LIMS

0002927038




SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120001577
Project : PO#017018
LR Report : CA13922-MAY22

Note: Provincial unionized ammonia calculated from field pH and temperature provided on the chain of custody form.



Carrie Greenlaw
Project Specialist,
Environment, Health & Safety



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120001577
Project : PO#017018

07-June-2022

OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

Date Rec. : 21 May 2022
LR Report: CA13922-MAY22

P.O. Box 760
Southampton, ON
N0H 2L0, Canada

Copy: #1

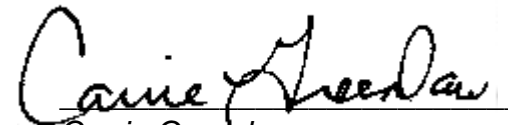
Phone: 519-797-2561
Fax:pdf

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	19: Well 6D-OW6-D (Well 2)	20: Well 6I-OW6-I (Well 3)	21: Well 57-OW57 (Well 13)	22: Well 56-OW56 (Well 12)	24: Well 2I-OW2-I (Well 8)
Sample Date & Time					20-May-22 09:30	20-May-22 09:20	20-May-22 09:10	20-May-22 09:05	20-May-22 08:55
Temperature Upon Receipt [°C]	---	---	---	---	19.0	19.0	19.0	19.0	19.0
Alkalinity [mg/L as CaCO ₃]	25-May-22	06:31	27-May-22	14:26	280	337	484	310	385
Conductivity [uS/cm]	25-May-22	06:31	27-May-22	14:26	485	584	824	519	647
pH [No unit]	25-May-22	06:31	27-May-22	14:26	8.27	8.23	7.54	8.18	8.27
Temperature @ pH [°C]	25-May-22	06:31	27-May-22	14:26	21.8	22.2	19.1	22.3	22.1
Organic Nitrogen [mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	28-May-22	09:48	01-Jun-22	14:19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	28-May-22	14:36	30-May-22	14:51	0.005	0.017	< 0.001	<0.004	<0.004
Ammonia+Ammonium (N) [as N mg/L]	28-May-22	14:36	30-May-22	14:50	< 0.1	0.2	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	25-May-22	10:41	27-May-22	12:45	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-22	17:51	27-May-22	11:12	< 1	1	2	2	1
Phosphorus (total) [mg/L]	31-May-22	16:16	01-Jun-22	13:06	---	---	---	---	---
Phosphorus (dissolved reactive) [mg/L]	25-May-22	13:01	26-May-22	10:16	---	---	---	---	---
Chloride [mg/L]	06-Jun-22	10:55	06-Jun-22	15:27	2	3	< 1	< 1	1
Sulphate [mg/L]	06-Jun-22	12:10	06-Jun-22	15:27	7	8	8	< 2	6
Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	< 0.06	0.62	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	26-May-22	10:42	31-May-22	11:56	< 0.06	< 0.06	0.62	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO ₃]	29-May-22	17:15	31-May-22	11:29	276	346	506	306	384
Magnesium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	26.7	33.9	35.4	19.6	33.0
Calcium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	66.6	82.6	144	90.2	99.3

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	19: Well 6D-OW6-D (Well 2)	20: Well 6I-OW6-I (Well 3)	21: Well 57-OW57 (Well 13)	22: Well 56-OW56 (Well 12)	24: Well 2I-OW2-I (Well 8)
Iron (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	< 0.007	< 0.007	< 0.007	< 0.007	0.014
Sodium (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	4.87	4.05	0.82	0.52	2.66
Phosphorus (dissolved) [mg/L]	29-May-22	17:15	31-May-22	11:29	0.005	0.015	0.004	< 0.003	0.104

Note: Provincial unionized ammonia calculated from field pH and temperature provided on the chain of custody form.



Carrie Greenlaw
Carrie Greenlaw
Project Specialist,
Environment, Health & Safety



Waterworks/Project # 120001577	C of C LIMS No: Aug - 13878 13879
Facility Name Tobermory Sewage Treatment Plant	Laboratory Section _____ Sample condition upon receipt _____
Org. # 1132	Date Rec'd: AUG 2 2 2022 Time Rec'd _____
Quote # _____	Temperature Upon Receipt 24x3 °C Initials _____
Attached Parameter List <input type="checkbox"/> No <input type="checkbox"/> Yes	

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: b App. 24-48 h 5-7d 7-10d Other Specify: _____

Address:	Report to: Process & Compliance Technician (PCT) 18 Caroline Street Southampton, ON N0H 2L0	Data Transfer Contact: PCT 18 Caroline Street Southampton, ON N0H 2L0	Invoice To: Ontario Clean Water Agency 18 Caroline Street Southampton, ON N0H 2L0	Laboratory: SGS Lakefield 185 Concession St. Lakefield, ON K0L 2H0
Telephone:	519-374-5782	519-374-5782	(519) 797-2561	705-652-2000
Fax:	(519) 797-3080	(519) 797-3080	(519) 797-3080	705-652-6365
Email:	kyoung@ocwa.com	kyoung@ocwa.com	apwesthighlands@ocwa.com	carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	Bottles	Type		Parameters																	Comments	Upload to OCWA	
					Alkalinity	Conductivity	Free Ammonia	Phenols	pH	Chloride	Sulphates	Nitrite	Magnesium	Iron	Nitrate	Calcium	Hardness	Sodium	DOC	Organic Nitrogen	TKN	Dissolved Reactive Phosphorus	Total Phosphorous			
Well	6S	- DRY	08-18-22 11:30	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	6I	-	11:20	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	6D	-	11:40	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	7S	-	DRY	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	9S	-	10:30	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	9I	-	10:35	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	9D	-	10:40	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	10S	-	12:36	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	11S	-	12:15	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	12S	-	11:45	Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Sampler Name: _____ Sampler Signature: _____

10:15 HCEW
KMM
608079386500
60807939



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

P.O. Box 760
Southampton, ON
N0H 2L0, Canada

Phone: 519-797-2561
Fax:pdf

Works #: 120001577
Project : PO#017018

31-August-2022

Date Rec. : 22 August 2022
LR Report: CA13879-AUG22

Copy: #1

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Well 6I	6: Well 6D	7: Well 9S	8: Well 9I	9: Well 9D
Sample Date & Time					18-Aug-22 11:20	18-Aug-22 11:40	18-Aug-22 10:30	18-Aug-22 10:35	18-Aug-22 10:40
Temperature Upon Receipt [°C]	---	---	---	---	24.0	24.0	24.0	24.0	24.0
Alkalinity [mg/L as CaCO3]	22-Aug-22	15:47	23-Aug-22	12:14	314	251	276	258	223
Conductivity [uS/cm]	22-Aug-22	15:47	23-Aug-22	12:14	597	486	511	490	446
pH [No unit]	22-Aug-22	15:47	23-Aug-22	12:14	7.80	7.86	7.84	8.04	7.99
Temperature @ pH [°C]	22-Aug-22	15:47	23-Aug-22	12:14	20.1	20.4	20.1	20.2	20.2
Organic Nitrogen [mg/L]	22-Aug-22	17:54	25-Aug-22	13:00	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	22-Aug-22	17:54	23-Aug-22	13:09	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	23-Aug-22	22:13	25-Aug-22	13:01	0.008	0.006	0.002	<0.003	<0.003
Ammonia+Ammonium (N) [as N mg/L]	23-Aug-22	22:13	25-Aug-22	13:00	0.3	0.2	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	23-Aug-22	11:14	24-Aug-22	08:37	0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	22-Aug-22	20:42	23-Aug-22	08:25	2	1	1	< 1	1
Phosphorus (total) [mg/L]	22-Aug-22	14:29	23-Aug-22	13:09	---	0.04	< 0.03	---	---
Phosphorus (dissolved reactive) [mg/L]	23-Aug-22	09:38	26-Aug-22	08:39	---	0.03	< 0.03	---	---
Chloride [mg/L]	24-Aug-22	10:35	31-Aug-22	15:35	2	1	< 1	2	< 1
Sulphate [mg/L]	24-Aug-22	11:12	31-Aug-22	15:35	10	5	4	21	16
Nitrite (as N) [mg/L]	22-Aug-22	21:16	30-Aug-22	11:04	0.10	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	22-Aug-22	21:16	30-Aug-22	11:04	< 0.06	0.11	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	22-Aug-22	21:16	30-Aug-22	11:04	0.10	0.11	< 0.06	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	25-Aug-22	18:04	26-Aug-22	16:32	322	255	276	265	234
Magnesium (dissolved) [mg/L]	25-Aug-22	18:04	26-Aug-22	16:32	30.0	23.7	22.4	23.9	22.4

OnLine LIMS

0003032637



SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120001577
Project : PO#017018
LR Report : CA13879-AUG22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Well 6I	6: Well 6D	7: Well 9S	8: Well 9I	9: Well 9D
Calcium (dissolved) [mg/L]	25-Aug-22	18:04	26-Aug-22	16:32	79.6	62.8	73.7	66.7	56.6
Iron (dissolved) [mg/L]	25-Aug-22	18:04	26-Aug-22	16:32	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	25-Aug-22	18:04	26-Aug-22	16:32	2.81	6.00	1.16	6.56	3.89
Phosphorus (dissolved) [mg/L]	25-Aug-22	18:04	26-Aug-22	16:32	---	0.006	0.003	---	---

Analysis	10: Well 10S	11: Well 11S	12: Well 12S
Sample Date & Time	18-Aug-22 12:30	18-Aug-22 12:15	18-Aug-22 11:45
Temperature Upon Receipt [°C]	24.0	24.0	24.0
Alkalinity [mg/L as CaCO3]	220	346	280
Conductivity [uS/cm]	418	645	846
pH [No unit]	7.97	7.85	7.95
Temperature @ pH [°C]	20.5	20.3	20.2
Organic Nitrogen [mg/L]	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	0.002	<0.002	0.002
Ammonia+Ammonium (N) [as N mg/L]	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	3	2	2
Phosphorus (total) [mg/L]	0.94	< 0.03	0.06
Phosphorus (dissolved reactive) [mg/L]	< 0.03	< 0.03	< 0.03
Chloride [mg/L]	< 1	1	89
Sulphate [mg/L]	18	14	28
Nitrite (as N) [mg/L]	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	< 0.06	1.68	1.74
Nitrate + Nitrite (as N) [mg/L]	< 0.06	1.68	1.74
Hardness (dissolved) [mg/L as CaCO3]	216	364	300
Magnesium (dissolved) [mg/L]	19.3	28.7	18.4
Calcium (dissolved) [mg/L]	54.8	98.6	89.9
Iron (dissolved) [mg/L]	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	3.17	1.67	56.4
Phosphorus (dissolved) [mg/L]	< 0.003	< 0.003	< 0.003

Note: Provincial unionized ammonia calculated using lab results for pH and temperature.

OnLine LIMS

0003032637



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120001577
Project : PO#017018
LR Report : CA13879-AUG22

Hawley Anderson, Hon.B.Sc
Project Specialist,
Environment, Health & Safety

Waterworks/Project # **120001577** C of C LIMS No: **Oct-15226**

Facility Name **Tobermory Sewage Treatment Plant** Laboratory Section _____ Sample condition upon receipt _____

Org. # **1132** Date Rec'd: **10/14/19** Time Rec'd: **10:30** Initials: **CL**

Quote # _____ Attached Parameter List No Yes Temperature Upon Receipt **14.3** °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____ b App. 24-48 h 5-7d 7-10d Other _____ Specify: _____

Report to: Process & Compliance Tech (PCT)	Data Transfer Contact: PCT	Invoice To: Ontario Clean Water Agency	Laboratory: SGS Lakefield Research Ltd
Address: 18 Caroline Street Southampton, ON N0H 2L0	18 Caroline Street Southampton, ON N0H 2L0	18 Caroline Street Southampton, ON N0H 2L0	185 Concession St. Lakefield, ON K0L 2H0
Telephone: 519-374-5782	519-374-5782	519-797-2561	705-652-2000
Fax: (519) 797-3080	(519) 797-3080	(519) 797-3080	705-652-6365
Email: kyounq@ocwa.com	kyounq@ocwa.com	apwesthighlands@ocwa.com	carne.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	Bottles	Parameters																	Comments	Unload to OCWA			
					Alkalinity	Conductivity	Free Ammonia	Phenols	pH	Chloride	Sulphates	Nitrite	Magnesium	Iron	Nitrate	Calcium	Hardness	Sodium	DOC	Organic Nitrogen	TKN			Discharged Phosphorus	Total Phosphorus	
Well	5S	-	13-10-22 12:00	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	5I	-	12:05	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	5D	-	12:10	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	9D	-	09:30	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	9I	-	13-10-22 09:15	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	9S	-	09:20	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	8I	-	09:45	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	8D	-	09:50	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	10S	-	11:30	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	11S	-	11:20	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	12S	-	11:10	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	1D	-	12:30	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	1I	-	12:20	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	6S	-	11:00	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	6D	-	10:55	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	6I	-	10:50	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	57	-	10:35	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	56	-	10:30	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	2S	-	10:25	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	2I	-	10:15	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	2D	-	10:20	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	55	-	10:05	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	7S	-	10:00	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well	60	-	11:40	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	61	-	11:45	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Well	8S	-	09:40	Kit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		DRY	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Sampler Name: _____ Sampler Signature: _____

*REMOVED x3 WWSRCS L08485P
OCTOBER*

ACR5N x3, 10, 10:30





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Project : PO#017018

01-November-2022

OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

Date Rec. : 14 October 2022
LR Report: CA15226-OCT22

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CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	21: Well 57-OW57 (Well 13)	22: Well 56-OW56 (Well 12)	24: Well 21-OW2-1 (Well 8)	25: Well 2D-OW2-D (Well 9)	26: Well 55-OW55 (Well 11)	28: Well 60-OW60 (Well 14)	29: Well 61-OW61 (Well 15)
Sample Date & Time					13-Oct-22 10:35	13-Oct-22 10:30	13-Oct-22 10:15	13-Oct-22 10:20	13-Oct-22 10:05	13-Oct-22 11:40	13-Oct-22 11:45
Temperature Upon Receipt [°C]	---	---	---	---	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Alkalinity [mg/L as CaCO3]	14-Oct-22	14:22	17-Oct-22	13:38	472	402	392	258	411	358	293
Conductivity [uS/cm]	14-Oct-22	14:22	17-Oct-22	13:38	807	679	673	496	718	997	759
pH [No unit]	14-Oct-22	14:22	17-Oct-22	13:38	7.49	7.24	7.62	7.72	7.37	7.65	7.60
Temperature @ pH [°C]	14-Oct-22	14:22	17-Oct-22	13:38	18.9	18.4	18.4	18.3	17.9	17.6	17.6
Organic Nitrogen [mg/L]	20-Oct-22	15:34	21-Oct-22	16:35	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	20-Oct-22	15:34	21-Oct-22	16:34	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	19-Oct-22	22:15	20-Oct-22	14:08	< 0.001	< 0.001	< 0.001	< 0.001	0.004	0.001	< 0.001
Ammonia+Ammonium (N) [as N mg/L]	19-Oct-22	22:15	20-Oct-22	14:07	< 0.1	< 0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	17-Oct-22	11:13	18-Oct-22	09:23	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	20-Oct-22	21:49	21-Oct-22	12:18	3	3	2	1	3	3	2
Phosphorus (total) [mg/L]	25-Oct-22	18:02	27-Oct-22	08:24	---	---	---	---	---	---	---
Phosphorus (dissolved reactive) [mg/L]	17-Oct-22	11:00	18-Oct-22	09:29	---	---	---	---	---	---	---
Chloride [mg/L]	19-Oct-22	11:14	29-Oct-22	12:18	< 1	< 1	< 1	< 1	< 1	140	70
Sulphate [mg/L]	19-Oct-22	11:41	29-Oct-22	12:18	6	< 2	5	20	2	34	30
Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03	< 0.03
Nitrate (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.56	0.12	< 0.06	< 0.06	0.95	0.66	0.17
Nitrate + Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.56	0.12	< 0.06	< 0.06	1.02	0.66	0.17
Hardness (dissolved) [mg/L as CaCO3]	28-Oct-22	18:00	31-Oct-22	16:34	460	361	362	227	412	360	348
Magnesium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	33.5	24.6	29.9	22.0	23.8	25.6	29.4
Calcium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	129	104	95.7	54.7	126	102	90.7
Iron (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	0.84	0.99	2.87	22.5	1.13	76.4	37.2
Phosphorus (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	0.004	0.004	0.055	< 0.003	0.010	0.071	0.005

OnLine LIMS

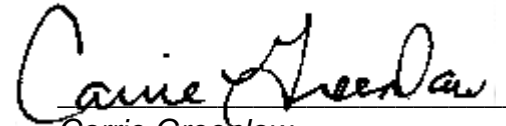
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LR Report : CA15226-OCT22


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01-November-2022

Date Rec. : 14 October 2022
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CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Well 5S-OW5-S (Well 4)	6: Well 5I-OW5-I (Well 5)	7: Well 5D-OW5-D (Well 6)	8: Well 9D-OW9-D (Well 20)	9: Well 9I-OW9-I (Well 19)	10: Well 9S-OW9-S (Well 18)	11: Well 8I-OW8-I (Well 16)
Sample Date & Time					13-Oct-22 12:00	13-Oct-22 12:05	13-Oct-22 12:10	13-Oct-22 09:30	13-Oct-22 09:15	13-Oct-22 09:20	13-Oct-22 09:45
Temperature Upon Receipt [°C]	---	---	---	---	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Alkalinity [mg/L as CaCO3]	14-Oct-22	14:22	17-Oct-22	13:38	245	218	213	220	250	312	257
Conductivity [uS/cm]	14-Oct-22	14:22	17-Oct-22	13:38	660	839	799	432	490	560	487
pH [No unit]	14-Oct-22	14:22	17-Oct-22	13:38	7.98	8.05	7.98	8.12	8.16	7.88	8.00
Temperature @ pH [°C]	14-Oct-22	14:22	17-Oct-22	13:38	18.9	18.6	18.4	18.2	18.5	18.6	19.2
Organic Nitrogen [mg/L]	20-Oct-22	15:34	21-Oct-22	16:35	1.2	< 0.5	1.0	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	20-Oct-22	15:34	21-Oct-22	16:34	2.4	0.9	1.8	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	19-Oct-22	22:15	20-Oct-22	14:08	0.039	0.020	0.028	<0.003	0.005	0.002	<0.002
Ammonia+Ammonium (N) [as N mg/L]	19-Oct-22	22:15	20-Oct-22	14:07	1.1	0.5	0.8	< 0.1	0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	17-Oct-22	11:13	18-Oct-22	09:23	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	20-Oct-22	21:49	21-Oct-22	12:18	3	5	4	1	< 1	2	1
Phosphorus (total) [mg/L]	25-Oct-22	18:02	27-Oct-22	08:24	0.51	---	---	---	---	0.04	---
Phosphorus (dissolved reactive) [mg/L]	17-Oct-22	11:00	18-Oct-22	09:29	0.04	---	---	---	---	< 0.03	---
Chloride [mg/L]	19-Oct-22	11:14	29-Oct-22	12:18	62	150	140	< 1	2	2	7
Sulphate [mg/L]	19-Oct-22	11:41	29-Oct-22	12:18	17	43	28	16	21	5	16
Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	< 0.03	0.11	0.07	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.50	0.77	0.42	< 0.06	< 0.06	< 0.06	0.11
Nitrate + Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.50	0.89	0.49	< 0.06	< 0.06	< 0.06	0.11
Hardness (dissolved) [mg/L as CaCO3]	28-Oct-22	18:00	31-Oct-22	16:34	246	226	220	227	246	306	257
Magnesium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	17.4	15.5	15.1	22.8	23.2	25.8	25.3
Calcium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	69.9	65.0	63.2	53.4	60.4	80.0	61.2
Iron (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	0.008	0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	34.7	72.4	67.8	3.50	6.37	1.06	2.44
Phosphorus (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	0.023	0.025	0.016	< 0.003	< 0.003	0.003	< 0.003

OnLine LIMS

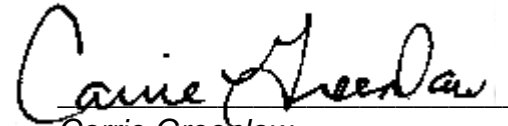
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01-November-2022

OCWA-Grey Bruce (Tobermory Sewage Plant)

Attn : Karla Young

Date Rec. : 14 October 2022
LR Report: CA15226-OCT22

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	12: Well 8D-OW8-D (Well 17)	13: Well 10S-OW10-S (Well 23)	14: Well 11S-OW11-S (Well 24)	15: Well 12S-OW12-S (Well 10)	16: Well 1D-OW1-D (Well 22)	17: Well 11-OW1-I (Well 21)	19: Well 6D-OW6-D (Well 2)	20: Well 6I-OW6-I (Well 3)
Sample Date & Time					13-Oct-22 09:50	13-Oct-22 11:30	13-Oct-22 11:20	13-Oct-22 11:10	13-Oct-22 12:30	13-Oct-22 12:20	13-Oct-22 10:55	13-Oct-22 10:50
Temperature Upon Receipt [°C]	---	---	---	---	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Alkalinity [mg/L as CaCO3]	14-Oct-22	14:22	17-Oct-22	13:38	278	223	350	275	280	351	284	318
Conductivity [uS/cm]	14-Oct-22	14:22	17-Oct-22	13:38	519	342	649	779	506	635	476	557
pH [No unit]	14-Oct-22	14:22	17-Oct-22	13:38	8.03	8.09	8.08	8.10	8.12	7.71	7.87	7.65
Temperature @ pH [°C]	14-Oct-22	14:22	17-Oct-22	13:38	18.4	18.3	18.5	18.3	18.2	19.0	19.3	18.7
Organic Nitrogen [mg/L]	20-Oct-22	15:34	21-Oct-22	16:35	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Kjeldahl Nitrogen [as N mg/L]	20-Oct-22	15:34	21-Oct-22	16:34	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	19-Oct-22	22:15	20-Oct-22	14:08	0.004	0.005	0.002	<0.003	0.003	< 0.001	0.006	0.006
Ammonia+Ammonium (N) [as N mg/L]	19-Oct-22	22:15	20-Oct-22	14:07	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.4
4AAP-Phenolics [mg/L]	17-Oct-22	11:13	18-Oct-22	09:23	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	20-Oct-22	21:49	21-Oct-22	12:18	1	3	2	2	1	2	1	2
Phosphorus (total) [mg/L]	25-Oct-22	18:02	27-Oct-22	08:24	---	0.88	0.03	0.04	---	---	---	---
Phosphorus (dissolved reactive) [mg/L]	17-Oct-22	11:00	18-Oct-22	09:29	---	< 0.03	< 0.03	< 0.03	---	---	---	---
Chloride [mg/L]	19-Oct-22	11:14	29-Oct-22	12:18	7	< 1	2	71	2	2	1	2
Sulphate [mg/L]	19-Oct-22	11:41	29-Oct-22	12:18	17	19	15	25	11	4	6	9
Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.08	< 0.06	1.76	1.14	< 0.06	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	19-Oct-22	17:37	27-Oct-22	16:16	0.08	< 0.06	1.76	1.14	< 0.06	< 0.06	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	28-Oct-22	18:00	31-Oct-22	16:34	265	205	356	292	222	341	248	309
Magnesium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	24.3	19.5	29.7	20.2	20.8	27.0	23.4	29.9
Calcium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	66.1	50.0	93.7	83.6	54.6	92.0	60.7	74.4
Iron (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Sodium (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	1.52	2.87	1.37	42.2	23.7	7.21	5.64	2.49
Phosphorus (dissolved) [mg/L]	28-Oct-22	18:00	31-Oct-22	16:34	< 0.003	< 0.003	0.003	0.003	0.026	0.961	0.003	0.018

OnLine LIMS

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LR Report : CA15226-OCT22

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Project Specialist,
Environment, Health & Safety



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix C

Sludge Haulage Volumes

2022 - Hauled Sewage

	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Bruce Peninsula Septic Service	3,730	7,780	16,150	87,150	65,150	24,725	23,100	23,200	39,225	44,530	25,430	7,830	368,000
Scott Septic Pumping (Ryan)					73,500	233,900	352,200	363,700	224,800	98,000	7,000		1,353,100
Mountain Trout Camp							3,300	13,200	5,500	11,000			33,000
Total	3,730	7,780	16,150	87,150	138,650	258,625	378,600	400,100	269,525	153,530	32,430	7,830	1,754,100

*amounts in gallons



Ontario Clean Water Agency
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Appendix D

Calibration Reports



VeriMaster - Flow Meter Verification Report

Customer Information		Meter Information	
Customer	OCWA	Meter Owner	Lift Station
Verification Download	Jun-15-22	Meter Type	WaterMaster
		Sensor Size	DN150
		Pipe Status	Fluid Present
		Sensor Type	Fullbore
		Sensor Serial No	3K620000270131
		Transmitter Serial No	3K620000270131
		Tag	
		Location	?

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/-1% of its original factory calibration

Summary of Results		Verification History	
Coil Group	Passed	OIML Accuracy Alarms	0
Electrode Group	Passed	Totaliser Information	
Sensor Group	Passed	Forward	318234.00 m3
Transmitter Signal	Passed	Reverse	396.00 m3
Transmitter Driver	Passed	Net	317837.00 m3
Output Group	Passed	Sensor Data	
Configuration	Passed	Coil Current	179.9 mA
		Coil Inductance	153.9 mH
		Coil Inductance Shift	0.0%
		Coil / Loop Resistance	35.6 ohm
Sensor Information		Transmitter Data	
Q3	175.00 l/s	Tx Gain - Adjustment	0.0%
Calibration Accuracy	OIML Class 2	VeriMaster Information	
Sensor Calibration Factors	140.3%; -4.30 mm/s; 11	Version	01.00.03
Date of Manufacture	18 Apr 2018	Limit Version	01.00.01
Run Hours	704days 9hrs -32536mins	Pulse Output	
Transmitter Information		Output 1: 1200.0Hz	Pass : 1199.990 Hz ; 0.00%
Application Version	V01.07.00 03/02/17	Output 1: 600.0Hz	Pass : 599.990 Hz ; 0.00%
MSP Version	01.00.00	Output 2: 1200.0Hz	Pass : 1199.990 Hz ; 0.00%
Date of Manufacture	18 Apr 2018	Output 2: 600.0Hz	Pass : 599.990 Hz ; 0.00%
Run Hours	1409days 23hrs -15616mins		
Current Output			
4mA Value	Pass : 4.000 mA ; 0.00%		
12mA Value	Pass : 12.000 mA ; 0.00%		
20mA Value	Pass : 20.000 mA ; 0.00%		

Installation Comments / Equipment used:	Configuration Settings
Tobermory Lift Station	Mains Frequency 60 Hz
	Qmax 25.00 l/s
	Pulses/Unit 30.000000
	Pulses Limit Frequency 1200.0 Hz
	Sensor User Span/Zero 100.0%; 0.00 mm/s
	User Flow Cutoff/Hysterisis 1.00%; 20%
	Meter Mode Normal operation

Date Jun-15-22

Operator Signature

Print

ABB Instrumentation World Flow Technology			
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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix E

Biosolids Volume Modeling and Distribution Surveys for
Lagoon Cells 1 & 2

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.**

Hydrographic Acoustic Sonar
Biosolids Volume Modeling and Distribution Survey

Date; July 23, 2020.



Tobermory Wastewater Biosolids Primary Retention - Cell #1.

Prepared For: Mr. Leo-Paul Frigault
Operations Manager
Ontario Clean Water Agency
West Highlands Hub
Wiarton, On

Prepared By: Paul Makar
PW MAKAR INSPECTION SERVICES LTD.

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PLOT 6	LAGOON SUB-BOTTOM 3D SURFACE PLOT	19

PICTORIAL REPORT 20-22

SAFETY DOCUMENTATION

TASC CARDS FOR THE TIME ON-SITE	22-25
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1.0 INTRODUCTION

- 1.1 The Ontario Clean Water Agency contracted PW MAKAR INSPECTION SERVICES LTD. to conduct a Hydrographic Acoustic Sonar Biosolids Volume Modeling and Distribution Survey of the Tobermory primary retention wastewater-biosolids Cell #1.
- 1.2 The intent of this survey was to determine biosolids sludge volumes, identify biosolids sludge distribution patterns and loading areas within the Tobermory primary retention wastewater-biosolids Cell #1.
- 1.3 The Tobermory primary biosolids Cell #1 has an aeration mixing system, which was turned off for a period of 6 days prior to the hydrographic survey. This was to allow the suspended sludge particulate matter to settle and to dissipate any air pockets trapped within the biosolids sludge.
- 1.4 The survey was performed using a multi-frequency (200, 50 and a 12 kHz) acoustic profiling system in the shallow wastewater of the Tobermory Biosolids Cell #1. “Generally”, PW MAKAR has a two person survey crew conducting the multi patterns of survey lines. A manned vessel motor operator and safety advisor and a sonar technician, taking sludge samples, calibrating, setting the transduce frequencies and monitoring the raw data streaming from the remote controlled survey vessels onboard computer system to the Toughbook computer system in the manned vessel. The remote controlled survey vessel is attached to the manned vessel as a precaution on wastewater biosolids lagoons/cells due to plant growth and debris on the surface.
 - 1.4.1 The Tobermory Biosolids Cell #1 had an extensive amount of debris both on the surface and below the surface so much so it impacted the outboard motor of the manned vessel. To complete the hydrographic survey, PW MAKAR’s sonar technician had to manually row the remote controlled survey vessel and manned vessel. Our vessel motor operator and safety advisor was on shore monitoring the events.



1.4.1.1

Figure #1. Remote controlled, unmanned survey vessel, attached to manned vessel, in the Tobermory primary retention wastewater-biosolids Cells.

- 1.5 The precision navigation was provided by the survey vessels on-board GPS system and is incorporated with the acoustic profiling system. Processing of the acoustic data

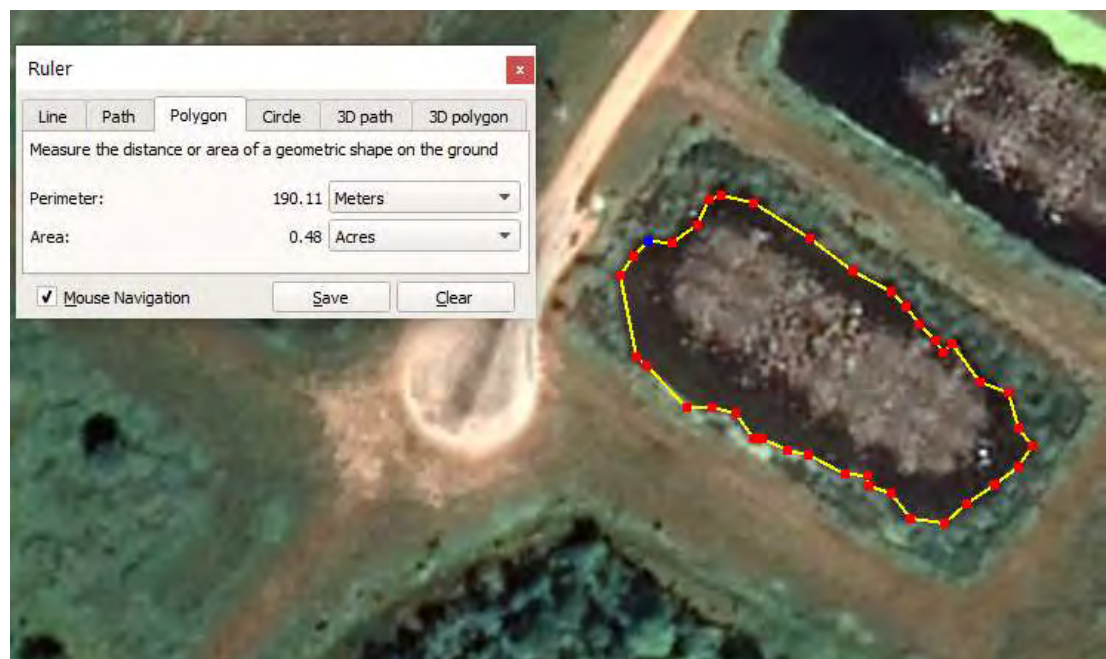
provides both an indication of the present fluid depth and an image of the extent of biosolids between the fluid bottom (upper biosolids surface contour bathymetric) and the liner/clay bottom (sub-bottom liner/clay contour) of the Tobermory Biosolids Cell #1.

- 1.6 This Biosolids Volumes and Distribution Survey were prompted by the Ontario Clean Water Agency Tobermory, Ontario, so that further treatment alternatives could be looked at.

2.0 SITE DESCRIPTION

- 2.1 The Tobermory wastewater treatment works consists of two (2) wastewater retention – biosolids Cells, Cell #1 primary treatment and Cell #2 secondary treatment.
 - 2.1.1 Both the Cell #1 and Cell #2 were surveyed at this time. Cell #2 hydrographic report will be a separate report and not associated with this Cell #1 hydrographic report.
- 2.1 The underwater area surveyed within the Tobermory primary retention wastewater-biosolids Cell #1 – survey date; July 23, 202, has an underwater **Positive Planar Area** of **1,913.49 m² or 0.47 acres or 0.19 Ha.**

- 2.1.1.1 **Please note;** the area surveyed within the Tobermory primary retention wastewater-biosolids Cell #1 is dependent on the water level at the time of the survey. Any obstruction within the lagoon i.e. dykes, aeration systems, rock outcrops above and below the water, aquoduc plant life can also affect the size of the survey area.



2.1.2

Figure #2. An area reference qualifier was conducted by a polygon measurement made in Google Earth 7/8/2019 image of the Tobermory Biosolids Cell #1 was found to be approximately 0.48 Acres.¹

2.1.3 The Tobermory Biosolids Cell #1 property is located on the south side of Highway 6, approximately 3.5 kms from the Town of Tobermory, Ontario

3.0 DISCLAIMER

- 3.1 While PW MAKAR INSPECTION SERVICES LTD believes it has used best practice in obtaining the information contained in this report, in no event will PW MAKAR INSPECTION SERVICES LTD be liable for any commercial costs, damages, loss of profit, property damage or personal injury, including death sustained or suffered in connection with the use of data or subsequent processing of materials obtained during field efforts by PW MAKAR INSPECTION SERVICES LTD during this program, or consequential damages including, but not limited to those related to dredging, removal of biosolids, disposal of biosolids, or contamination resulting from use of data obtained from this report or efforts or conclusions drawn from this report.
- 3.2 PW MAKAR INSPECTION SERVICES LTD makes no warranty, either expressed or implied, regarding the suitability or fitness of any data or information contained in this report for a particular purpose or that the information will satisfy the requirement of any law, rule, specification, or contract.
- 3.3 The maximum liability of PW MAKAR INSPECTION SERVICES LTD. from all causes related to this work, field efforts, report or discussions about this effort is limited to the funding received by PW MAKAR INSPECTION SERVICES LTD for this work. Acceptance of this report signifies acceptance of this disclaimer.
- 3.4 This report shall be deemed accepted if no protest is received within 60 days of the issuance date of this report.

4.0 ABSTRACT

- 4.1 The shallow hydrographic underwater acoustic sonar survey was conducted on July 23, 2020, and this report reflects the water content and biosolids sludge levels at the time of this hydrographic survey.
- 4.2 The hydrographic survey was performed by PW MAKAR INSPECTION SERVICES LTD's, Sonar Technician, the survey complies with IHO (International Hydrographic Organization) Standards.
- 4.3 Transducer sound calibration checks were performed prior to the start of the hydrographic survey in the Tobermory Biosolids Cell #1.

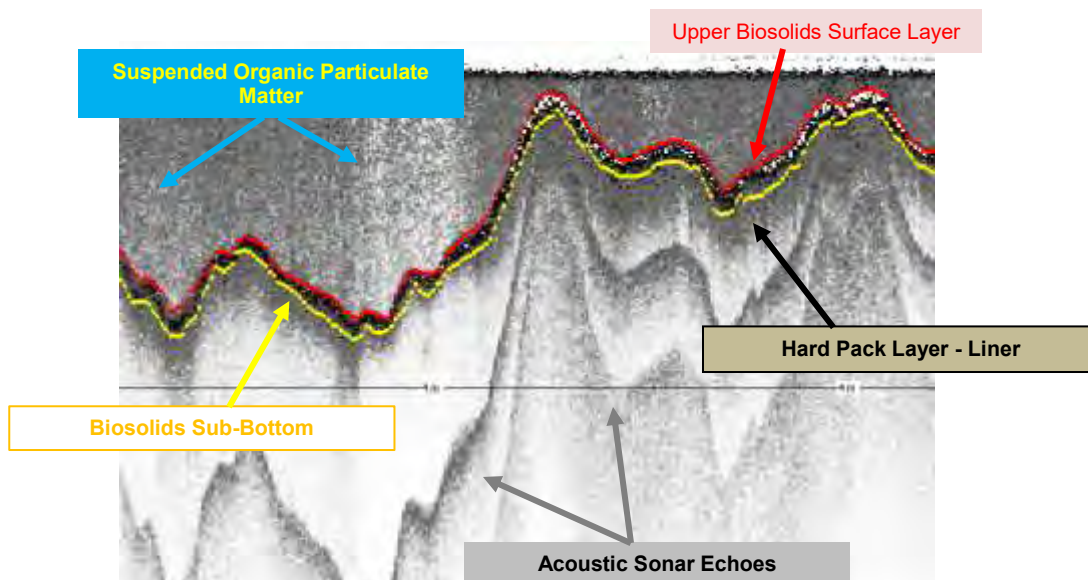
¹ Google Earth.
7/8/2019. - Most Current Google Image.

- 4.4 Biosolids samples were requested, they were obtain at different locations throughout from Cell #1 and put sample bottles supplied by OCWA.

5.0 BIOSOLIDS DEPTH EVALUATIONS

- 5.1 The sub-bottom contour in the Tobermory Biosolids Cell #1, has a “hard pack” sub-bottom layer i.e. clay, hard pack soil. All three of our hydrographic acoustic sonar transducers were utilized to determine the bathymetric bottom and sub-bottom in the lagoon.

- 5.1.1 Biosolids Isopach, volume computations were calculated from the bathymetric (upper surface) biosolids sludge layer using the 200 kHz transducer and the sub-bottom hard pack layer/liner utilizing both the 50 kHz and 12 kHz transducers.



- 5.1.2 Figure #3. Post processing of the digitized acoustic sonar signal echoes, July 2020, Tobermory Biosolids Cell #1.

- 5.2 The water level elevation was appropriate for conducting a hydrographic survey; extensive debris and aquodic plant life was present within the Tobermory Biosolids Cell #1 as well as growing within the inner berm, which have encroached upon the survey area particularly on the North, West and East sides of Cell #1.

- 5.2.1 There was adequate access and egress into Cell #1 at the time of the survey.

- 5.2.2 The total volume of biosolids surveyed on July 23, 2020 in the Tobermory Biosolids Cell #1, – is approximately **519.63 m³ or 679.65 yd³**.

- 5.2.2.1 To calculate a percentage of biosolids sludge, a grid volume computation was calculated from the bathymetric biosolids sludge bottom (defined as the top of the biosolids sludge) and the sub-bottom

of the biosolids sludge i.e. the top of the lagoon/cell liner. It is then divided by the grid volume computation calculated from the top of the liquid/water to the sub-bottom of the biosolids sludge of the lagoon/cell liner. The two number sets are then times (x) by 100 to determine a percentage of the biosolids.

Please note; the percentages of biosolids volumes will change/increase if water levels in the lagoon/cell fluctuate. In addition, if aluminum sulfate is added to the water and the suspended organic particles settles to the bottom this will add to the amount of biosolids sludge.

As well; the aeration mixing system was turned off for a period of 6 days prior to the hydrographic survey, there was still suspended organic matter in the water column of Cell #1 which would increase in the total amount of sludge if the suspended organic matter were to completely settle.

5.2.2.1.1 Therefore, on this date the percentage of biosolids buildup in the Tobermory Biosolids Cell #1 is approximately **12.68%**.

5.2.3 PW MAKAR Inspection Services Ltd. collected **24,362** digitized data value points in the Tobermory Biosolids Cell #1. The digitized data value points represent both the bathymetric bottom and sub-bottom biosolids values with GPS navigational values.

5.2.3.1 Each individual data value point consists of an XYZ value. X value is an Easting coordinate; Y value is a Northing coordinate and Z consists of a biosolids/sludge elevation processed in meters.

5.2.3.2 The average depth of biosolids sludge throughout the Tobermory Biosolids Cell #1 on this date was approximately **0.27 m or 270 mm or 10.62 in.**

6.0 GENERAL SITE EVALUATIONS

- 6.1 There is a heavy amount of short vegetation growing around the top of the beam of the wastewater lagoons, which should be monitored and cut back as required if not being allocated already.
- 6.2 There is extensive debris and aquodic plant life was present within the Tobermory Biosolids Cell #1 as well as growing within the inner berm, which have encroached upon the survey area particularly on the North, West and East sides of Cell #1.
- 6.3 There were no apparent berm erosion issues identified at this time.
- 6.4 Lagoon warning signage appeared appropriate.

Reported by: Paul Makar
Paul Makar

PW MAKAR COATINGS INSPECTION LTD. NACE CERTIFIED COATINGS INSPECTOR #137.

Grid Volume Computations

Bathymetric (Upper) Biosolids Surface and Sub-Bottom (Lower) – Liner Surface.

Tobermory primary retention wastewater-biosolids Cell #1.

Fri Jul 31 08:49:42 2020

Upper Surface

Grid File Name: C:- PROJECTS\OCWA - Tobermory Lagoon Surveys\Tobermory Cell 1 Tobermory - A
Layer Blanked out x2.grd
Grid Size: 88 rows x 100 columns

X Minimum: 448977.51
X Maximum: 449047.65
X Spacing: 0.70848484848499

Y Minimum: 5008992.64
Y Maximum: 5009052.52
Y Spacing: 0.68827586206768

Z Minimum: -3.5706332640788
Z Maximum: -0.29154967337266

Lower Surface

Grid File Name: C:- PROJECTS\OCWA - Tobermory Lagoon Surveys\Tobermory Cell 1 - Tobermory - B-
Layer BLANKEDout.grd
Grid Size: 88 rows x 100 columns

X Minimum: 448977.9
X Maximum: 449047.72
X Spacing: 0.70525252525201

Y Minimum: 5008991.57

Y Maximum: 5009052.97
Y Spacing: 0.70574712643036

Z Minimum: -3.7645280032213
Z Maximum: -0.29552466459216

Volumes

Z Scale Factor: 1

Total Volumes by:

Trapezoidal Rule: 509.75092006387
Simpson's Rule: 510.92281152889
Simpson's 3/8 Rule: 510.48660577901

Cut & Fill Volumes

Positive Volume [Cut]: 519.63367514349 m³ or 679.65 yd³.
Negative Volume [Fill]: 9.8827550796175
Net Volume [Cut-Fill]: 509.75092006387

Areas

Planar Areas

Positive Planar Area [Cut]: 1913.4980118853 m² or 0.47 acres or 0.19 Ha.
Negative Planar Area [Fill]: 82.647924934744
No Data Planar Area: 2290.8020631378
Total Planar Area: 4286.9479999578

Surface Areas

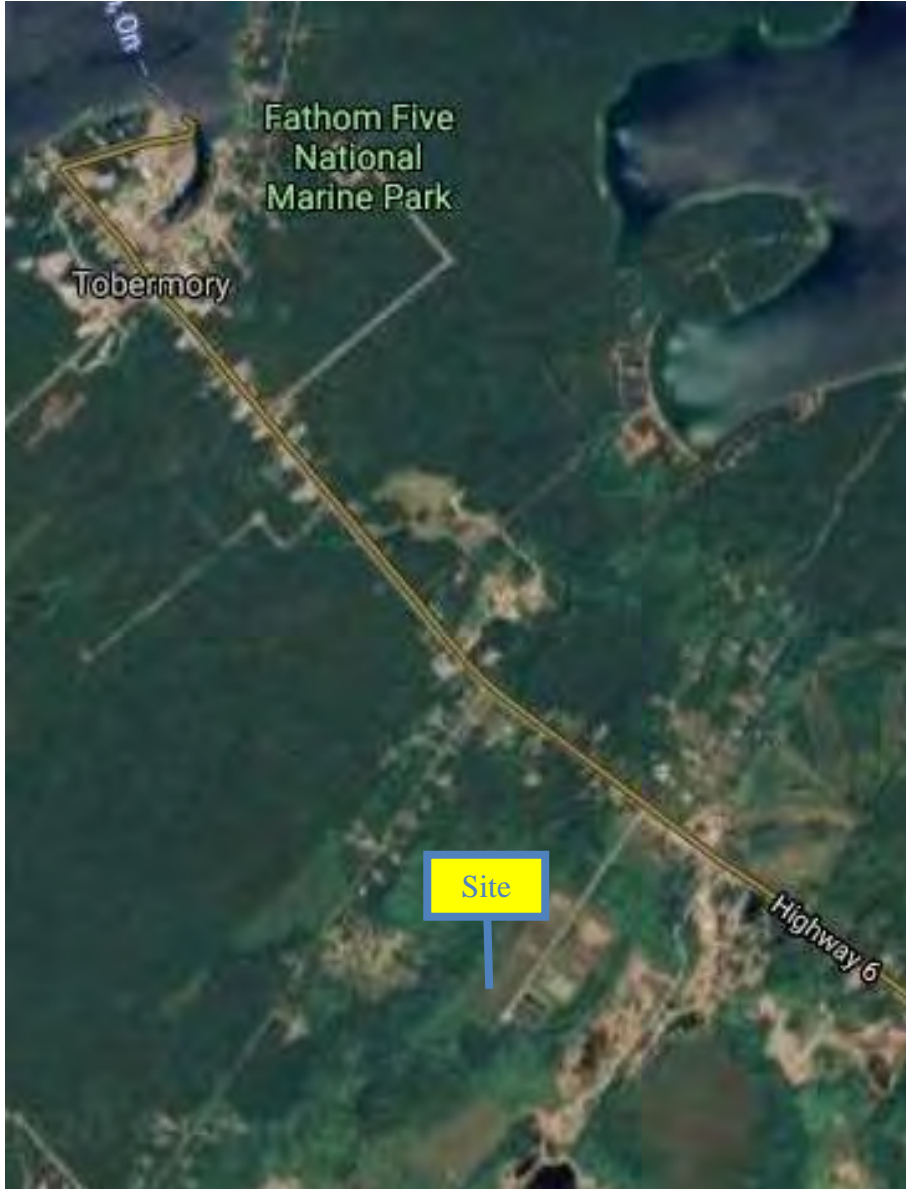
Positive Surface Area [Cut]: 1955.2692877998
Negative Surface Area [Fill]: 89.279421974063



Appended Figures and Maps



<p>PW MAKAR INSPECTION SERVICES LTD. HAS A LICENSING AGREEMENT WITH GOOGLE INC. TO REPRODUCE AND PUBLISH THE FOLLOWING IMAGE. NO FURTHER REPRODUCTION OR PUBLISHING OF THIS IMAGE IS PERMITTED UNLESS WRITTEN CONSENT FROM PW MAKAR INSPECTION SERVICES LTD.</p>	<p>SITE MAP LOCATION</p> <p>Ontario Clean Water Agency Tobermory, On Tobermory Primary Wastewater Biosolids Cell #1.</p>
<p>DATE: July 23, 2020</p>	<p>FIGURE No.4</p>



PW MAKAR INSPECTION SERVICES LTD. HAS A LICENSING AGREEMENT WITH GOOGLE INC. TO REPRODUCE AND PUBLISH THE FOLLOWING IMAGE. NO FURTHER REPRODUCTION OR PUBLISHING OF THIS IMAGE IS PERMITTED UNLESS WRITTEN CONSENT FROM PW MAKAR INSPECTION SERVICES LTD.

SITE AERIAL AP LOCATION

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Primary
 Wastewater Biosolids Cell #1.

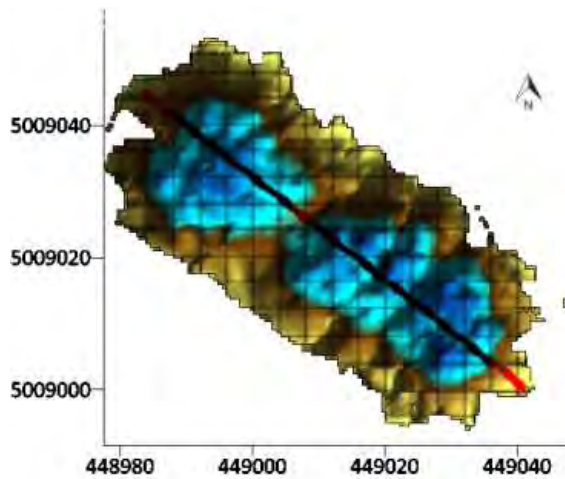
DATE; July 23, 2020

FIGURE No.5

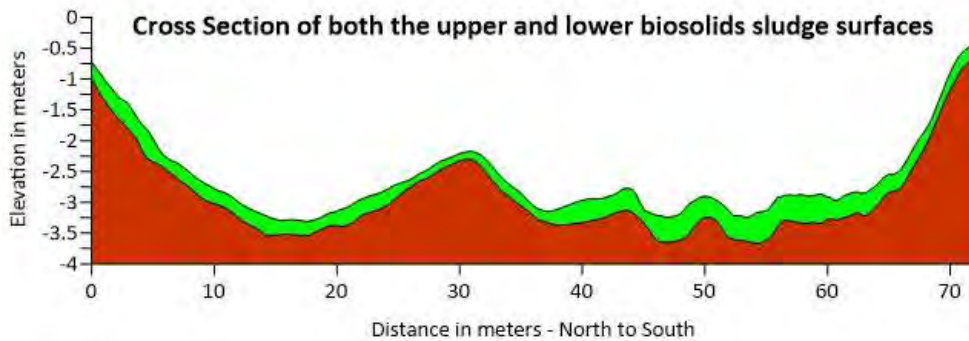
Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Primary Retention - Cell #1.**

Visual Representation of the Biosolids Sludge Layers
 Sliced from North to South



The average depth of Biosolids Sludge in the Tobermory Cell #1 is 0.27 m or 270 mm or 10.62 in.



Georeferencing Image and Hydrographic Survey Vessel Tracking Lines

Ontario Clean Water Agency
 Tobermory, Ontario
 Tobermory WWTP

Survey Date: July 23, 2020.

FIGURE No.6

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.**

Georeferencing Image and Hydrographic Survey Vessel Tracking Lines



Georeferencing Image and Hydrographic Survey Vessel
Tracking Lines

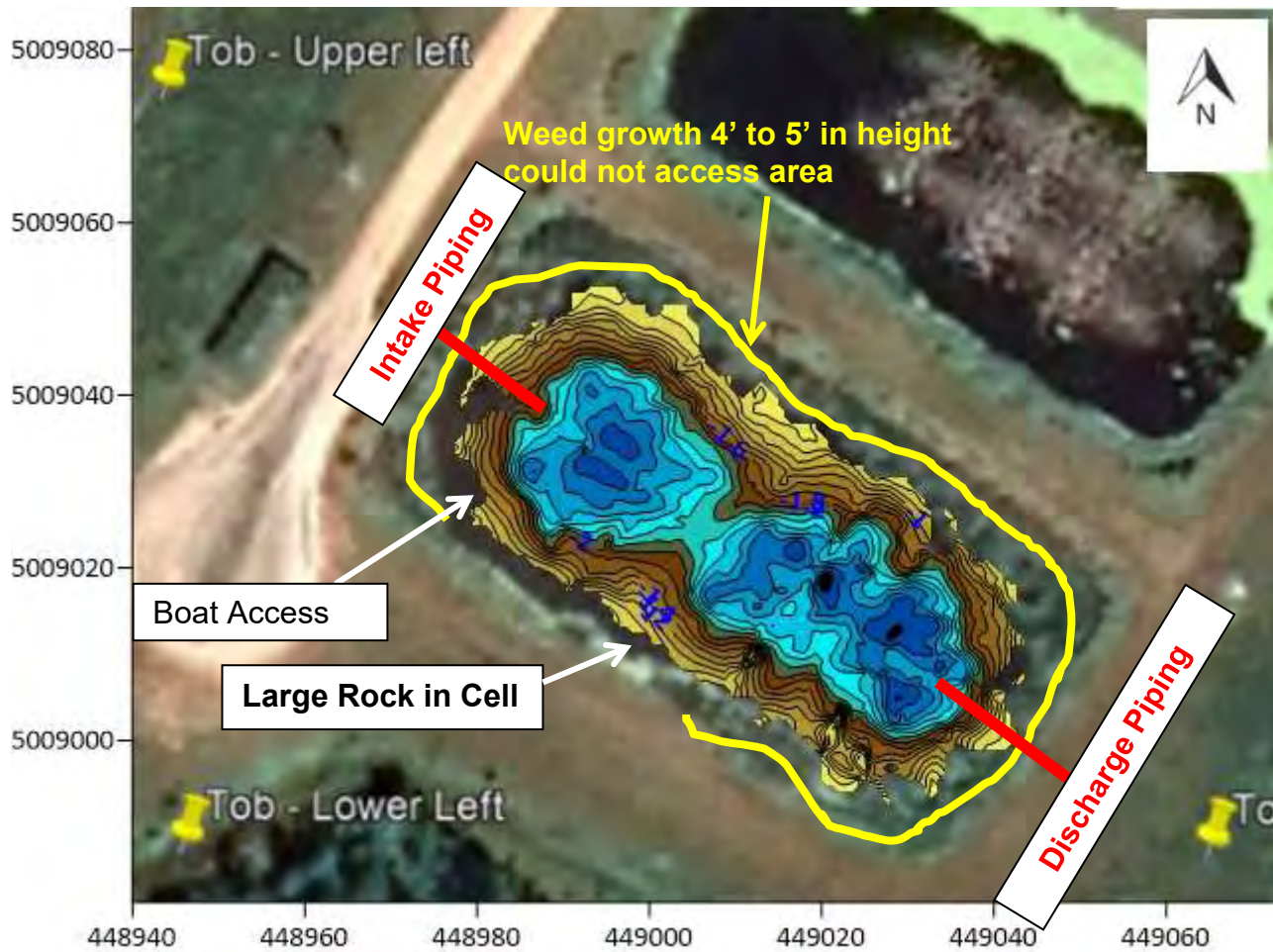
Ontario Clean Water Agency
Tobermory, Ontario
Tobermory WWTP

Plot #1

Survey Date: July 23, 2020.

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.
Georeferencing Image – Site Description**



Georeferencing Image and Hydrographic Survey
Vessel Tracking Lines

Ontario Clean Water Agency
Tobermory, Ontario
Tobermory WWTP

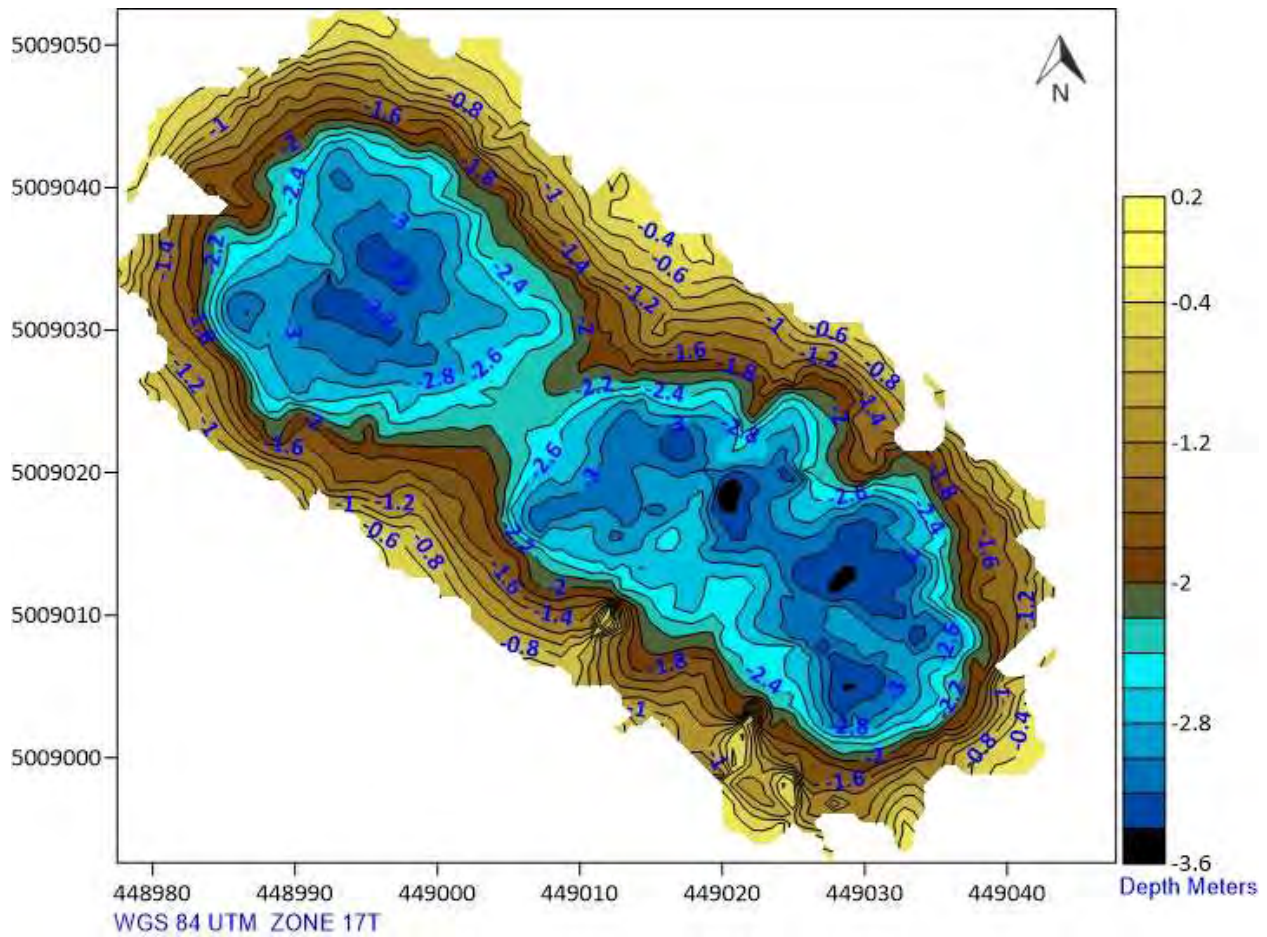
Plot #2

Survey Date: July 23, 2020.

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Primary Retention - Cell #1.**

Bathymetric Upper Biosolids Sludge Surface – Contour Map



Bathymetric (Upper Surface) Biosolids Distribution – Contour Map

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Primary
 Wastewater Biosolids Cell #1.

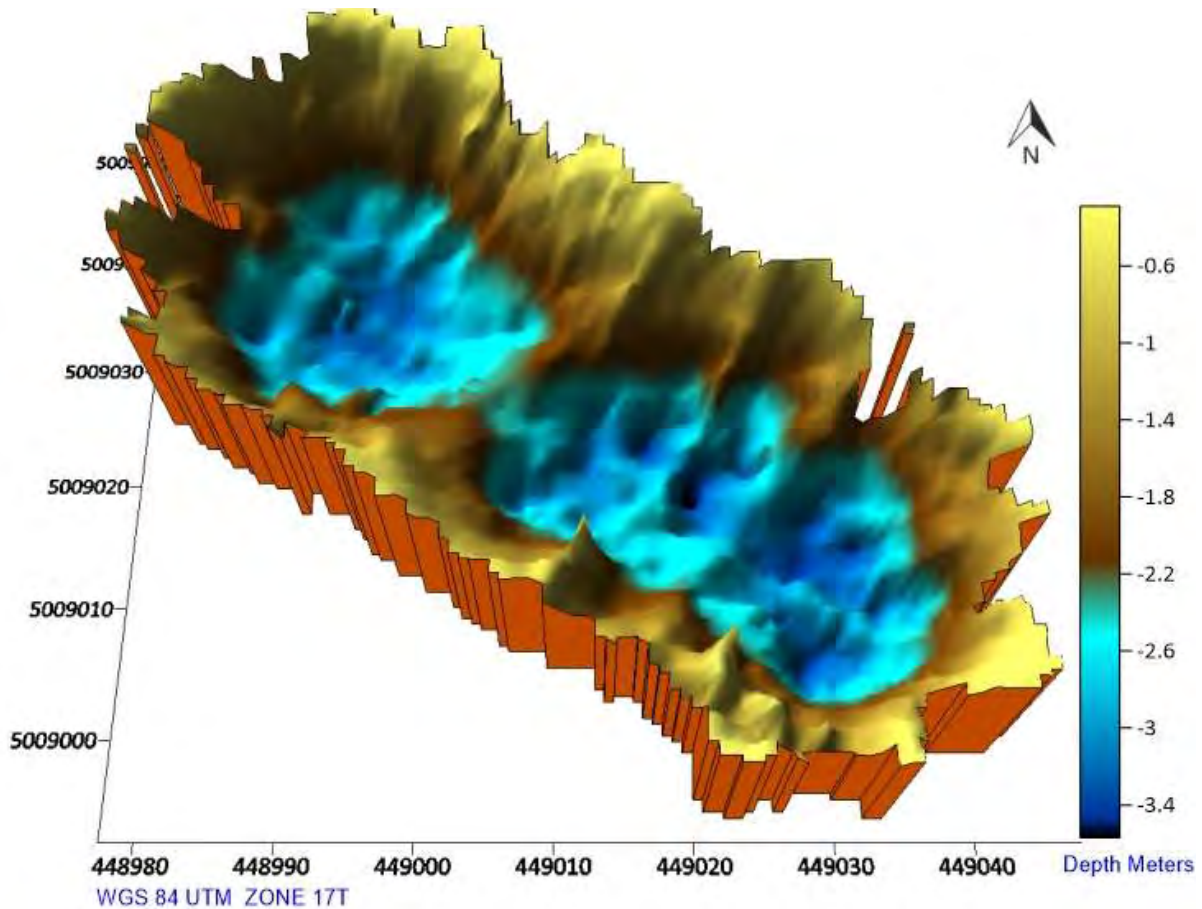
Plot #3

DATE: July 23, 2020

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.**

Bathymetric Upper Biosolids Sludge Surface – 3D Contour Map



Bathymetric (Upper Surface) Biosolids Distribution – 3D Contour Map

Ontario Clean Water Agency
Tobermory, On
Tobermory Primary
Wastewater Biosolids Cell #1.

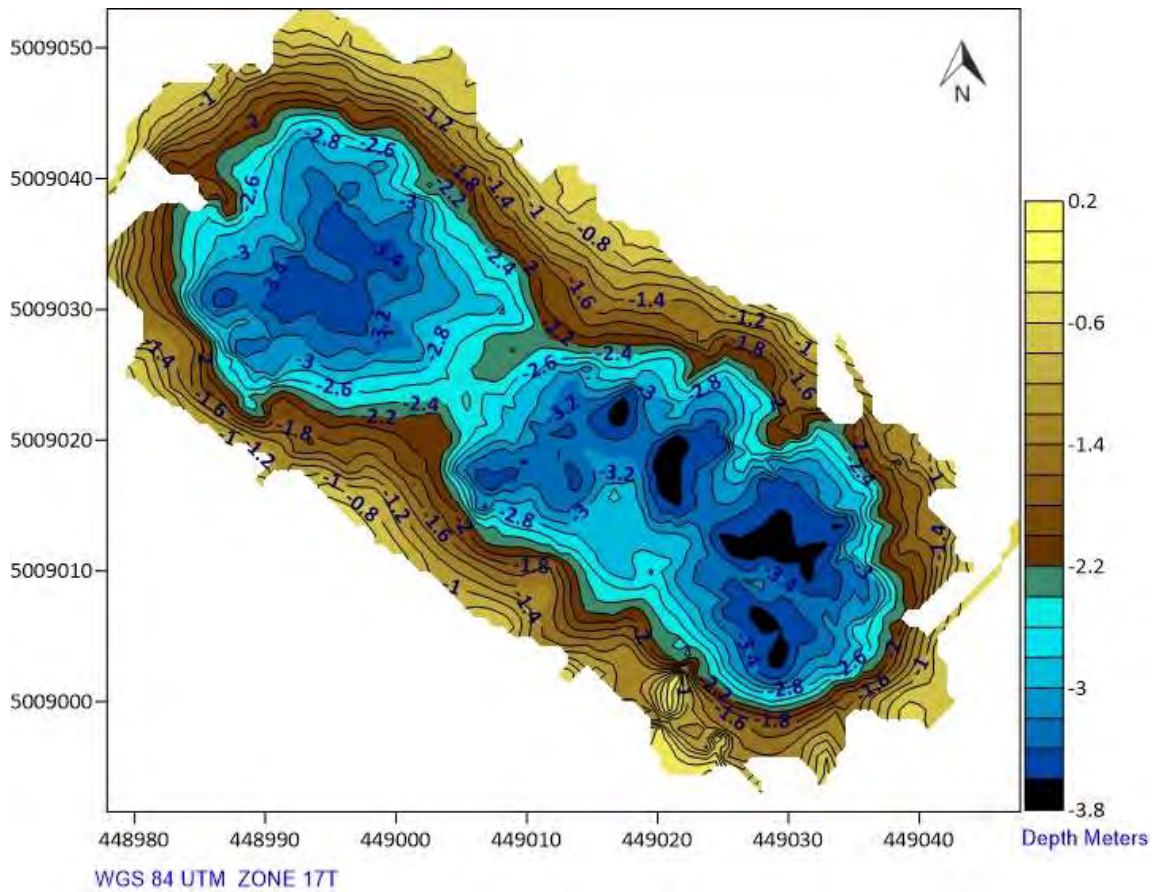
Plot #4

DATE: July 23, 2020

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Primary Retention - Cell #1.**

Lower Sub-Bottom Liner Surface – Contour Map



Lower Sub-Bottom (Liner/Clay/Hard Packed Soil) – Contour Map

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Primary
 Wastewater Biosolids Cell #1.

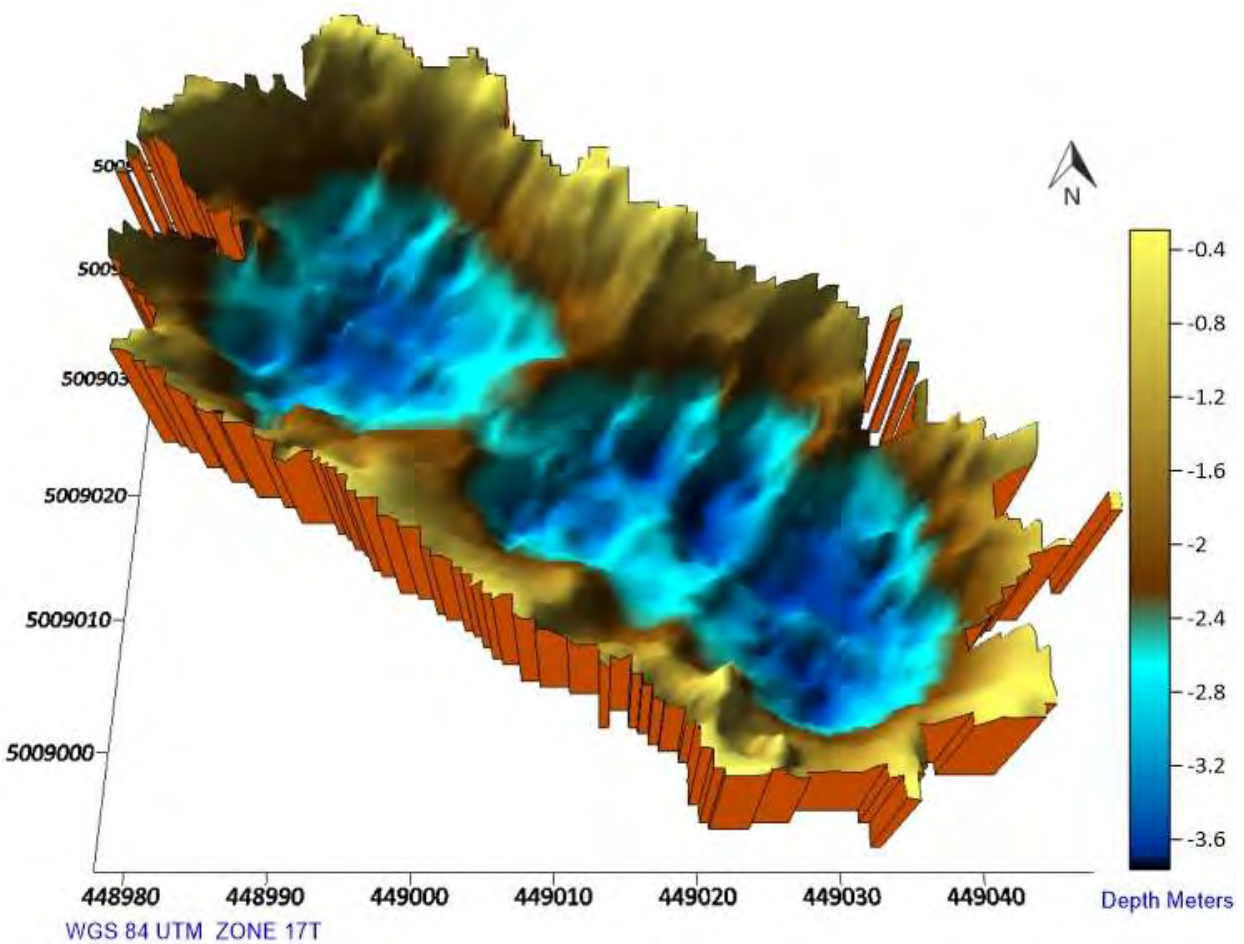
Plot #5

DATE: July 23, 2020

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.**

Lower Sub-Bottom Liner Surface – 3D Contour Map



Lower Sub-Bottom (Liner/Clay/Hard Packed Soil) – 3D Contour Map

Ontario Clean Water Agency
Tobermory, On
Tobermory Primary
Wastewater Biosolids Cell #1.

Plot #6

DATE: July 23, 2020

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Primary Retention - Cell #1.**

Hydrographic Acoustic Sonar
Biosolids Volume Modeling and Distribution Survey

Date; July 23, 2020

PICTORIAL REPORT



Digital image #1 – Tobermory Cell #1. – Three biosolids sludge samples were taken within Cell #1.



Digital image #2 – Tobermory Cell #1. – Three biosolids sludge samples were taken within Cell #1.

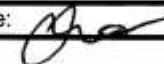


Digital image #3 – Tobermory Cell #1. – Remote controlled survey vessel and manned vessel.



Digital image #4 – Tobermory Cell #1. – Aquodic plant life on the surface of Cell#1.

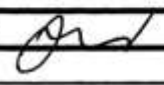
SAFETY PARTNERSHIP TASC		KEY STEPS
Company: <u>PLW MAKAR</u>	Date: <u>July 21 2020</u>	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together. 3. Keep the card with the crew at all times. 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor. 7. If you have questions, "ASK".
Employee: <u>JOEL WILLOK</u>	Emergency # <u>911</u>	
Foreman: <u>JOEL WILLOK</u>	Wind Direction: <u>SW</u>	
Job Location: <u>TOBERMORY LAGOON</u>	Emergency assembly location: <u>TRUCK</u>	
Do you require a permit for your work today? Yes <input type="radio"/> No <input checked="" type="radio"/> Permit # _____		
Special requirements? <u>COVID TEST, PPE</u>		
Did you sign into the unit? <u>N/A</u>		
Will weather conditions affect your work today? <u>NO</u>		
Is there a heat/cold stress issue today? Yes <input type="radio"/> No <input checked="" type="radio"/> Humidex <u>35</u>		
Where is the nearest eye wash station? <u>TRUCK</u>		
Did you inspect your tools and equipment? Yes <input checked="" type="radio"/> No <input type="radio"/>		
Could your activities impact you or others? Yes <input type="radio"/> No <input checked="" type="radio"/>		
<input type="radio"/> tiered work <input type="radio"/> overhead lifting <input type="radio"/> hot work <input type="radio"/> other _____		
Who is your site rep for emergency reporting? <u>LEO-PAUL FRIGAUULT</u>		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? Yes <input checked="" type="radio"/> No <input type="radio"/>		
Workers Names:		<p>It only takes a <i>minute</i> to prevent a <i>lifetime</i> of pain</p>
<u>JOEL WILLOK</u>		
<u>GREG CALMER</u>		

Describe your task today: SUNAR CELL 1 and 2		Did you visually inspect job-site BEFORE STARTING WORK? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Any issues? DEBRIS, ACCESS			
Job Steps	Hazards	Controls	
ACCESS LAGOON	WILDLIFE	WATCH STEP and Driving	
PUT VENT/DYAT IN CELL	SLIP, TRIP, FALLS	WE Ropes, Rely on Partner	
SUNAR CELL	DEBRIS, UNSANITARY WATER	WEAR PPE, TAKE TIME	
MEMORY JOGGER (EXAMPLES to help complete above section)			
Job Steps	Hazards	Controls	
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards	
<ul style="list-style-type: none"> o scan job site o get required tools/equipment o perform/ complete task o dismantle equipment o clean up job site 	<ul style="list-style-type: none"> o unfamiliar process system o spill/release o cords, cables, tools o dropping tools o thermal burns 	<ul style="list-style-type: none"> o lockout/ tagout o tie- off o lines drained/purged o shoring o fire extinguisher 	
Is housekeeping complete? <input checked="" type="radio"/> Yes <input type="radio"/> No	Supervisors Signature: 		
Is permit signed off? <input checked="" type="radio"/> Yes <input type="radio"/> No	Feedback: _____		

SAFETY PARTNERSHIP TASK		KEY STEPS
Company: PW MAKAR	Date: JULY 22 2020	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together. 3. Keep the card with the crew at all times. 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor. 7. If you have questions, "ASK".
Employee: JOEL WILLOCK	Emergency # 911	
Foreman: JOEL WILLOCK	Wind Direction: NW	
Job Location: TOBERMORY LAGOONS	Emergency assembly location: TRUCK	
Do you require a permit for your work today? Yes <input type="radio"/> No <input checked="" type="radio"/> Permit # _____		
Special requirements? COVID TEST, PPE		
Did you sign into the unit? N/A		
Will weather conditions affect your work today? YES - RAIN		
Is there a heat/cold stress issue today? Yes <input type="radio"/> No <input checked="" type="radio"/> Humidex		
Where is the nearest eye wash station? TRUCK		
Did you inspect your tools and equipment? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Could your activities impact you or others? Yes <input type="radio"/> No <input checked="" type="radio"/>		
o tiered work o overhead lifting o hot work o other _____		
Who is your site rep for emergency reporting? LEO-PAUL FRIGAULT		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Workers Names:		It only takes a <i>minute</i> to prevent a <i>lifetime</i> of pain
JOEL WILLOCK		
GREG CHAMBERS		

Describe your task today: SMAR CELL 1 and 2		Did you visually inspect job-site BEFORE STARTING WORK? <input checked="" type="radio"/> Yes <input type="radio"/> No
Job Steps		Any issues? DEBRIS, ACCESS
	Hazards	Controls
Put vessel in water	Slips, Trips, Falls	Watch step, use pusher
Search Lagoon	Debris, unsuiting water	Watch splashes, clean propeller.
Remove vessel	Injury, Falls	Watch Rocks, use caps to remove equipment.
MEMORY JOGGER (EXAMPLES to help complete above section)		
Job Steps	Hazards	Controls
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards
<input type="checkbox"/> scan job site <input type="checkbox"/> get required tools/equipment <input type="checkbox"/> perform/ complete task <input type="checkbox"/> dismantle equipment <input type="checkbox"/> clean up job site	<input type="checkbox"/> unfamiliar process system <input type="checkbox"/> spill/release <input type="checkbox"/> cords, cables, tools <input type="checkbox"/> dropping tools <input type="checkbox"/> thermal burns	<input type="checkbox"/> lockout/ tagout <input type="checkbox"/> tie- off <input type="checkbox"/> lines drained/purged <input type="checkbox"/> shoring <input type="checkbox"/> fire extinguisher
Is housekeeping complete? <input checked="" type="radio"/> Yes / <input type="radio"/> No	Supervisors Signature: <i>[Signature]</i>	
Is permit signed off? <input checked="" type="radio"/> Yes / <input type="radio"/> No	Feedback: _____	

SAFETY PARTNERSHIP TASC		KEY STEPS
Company: PW MAKAR	Date: July 23 2020	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together. 3. Keep the card with the crew at all times 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor 7. If you have questions, "ASK".
Employee: JOEL WILLOCK	Emergency # 911	
Foreman: JOEL WILLOCK	Wind Direction: SW	
Job Location: TORBEN MARY LAGOON	Emergency assembly location: TRUCK	
Do you require a permit for your work today? Yes <input checked="" type="radio"/> No <input type="radio"/> Permit # _____		
Special requirements? COVID TEST, PPE		
Did you sign into the unit? N/A		
Will weather conditions affect your work today? NO		
Is there a heat/cold stress issue today? <input checked="" type="radio"/> Yes <input type="radio"/> No Humidex 36		
Where is the nearest eye wash station? TRUCK		
Did you inspect your tools and equipment? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Could your activities impact you or others? Yes <input checked="" type="radio"/> No <input type="radio"/>		
<input type="checkbox"/> tiered work <input type="checkbox"/> overhead lifting <input type="checkbox"/> hot work <input type="checkbox"/> other N/A		
Who is your site rep for emergency reporting? Leo-Paul Frigault		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Workers Names:		It only takes a minute to prevent a lifetime of pain
JOEL WILLOCK		
GREG CHALMERS		

Describe your task today: SUNAR CELL 1 and 2		Did you visually inspect job-site BEFORE STARTING WORK?: <input checked="" type="radio"/> Yes <input type="radio"/> No	
Any issues? DEBRIS, ACCESS			
Job Steps	Hazards	Controls	
Insert Vessel into Cell	TRIP, Slips, Falls	TAKE TIME, Communicate	
Move Vessel / BOAT to Cell 2 (very cells)	Falls	Watch Step, Communicate	
	Debris, Unsteady Debris	PPE, TAKE TIME	
Remove vessel / BOAT	TRIP, Muscle Pull	use Ropes, Truck, Rely on Partners	
MEMORY JOGGER (EXAMPLES to help complete above section)			
Job Steps	Hazards	Controls	
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards	
<ul style="list-style-type: none"> o scan job site o get required tools/equipment o perform/ complete task o dismantle equipment o clean up job site 	<ul style="list-style-type: none"> o unfamiliar process system o spill/release o cords, cables, tools o dropping tools o thermal burns 	<ul style="list-style-type: none"> o lockout/ tagout o tie- off o lines drained/purged o shoring o fire extinguisher 	
Is housekeeping complete? <input checked="" type="radio"/> Yes <input type="radio"/> No	Supervisors Signature: 		
Is permit signed off? <input checked="" type="radio"/> Yes <input type="radio"/> No	Feedback: _____		

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Secondary Retention - Cell #2.**

Hydrographic Acoustic Sonar
Biosolids Volume Modeling and Distribution Survey

Date; July 24, 2020.



Tobermory Wastewater Biosolids Secondary Retention - Cell #2

Prepared For: Mr. Leo-Paul Frigault
Operations Manager
Ontario Clean Water Agency
West Highlands Hub
Wiarton, On

Prepared By: Paul Makar
PW MAKAR INSPECTION SERVICES LTD.

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PICTORIAL REPORT 20-21

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1.0 INTRODUCTION

- 1.1 The Ontario Clean Water Agency contracted PW MAKAR INSPECTION SERVICES LTD. to conduct a Hydrographic Acoustic Sonar Biosolids Volume Modeling and Distribution Survey of the Tobermory secondary retention wastewater-biosolids Cell #2.
- 1.2 The Tobermory secondary biosolids Cell #2 has an aeration mixing system, which was turned off for a period of 7 days prior to the hydrographic survey. This was to allow the suspended sludge particulate matter to settle and to dissipate any air pockets trapped within the biosolids sludge.
- 1.3 The survey was performed using a multi-frequency (200, 50 and a 12 kHz) acoustic profiling system in the shallow wastewater of the Tobermory Biosolids Cell #2. “Generally”, PW MAKAR has a two person survey crew conducting the multi patterns of survey lines. A manned vessel motor operator and safety advisor and a sonar technician, taking sludge samples, calibrating, setting the transduce frequencies and monitoring the raw data streaming from the remote controlled survey vessels onboard computer system to the Toughbook computer system in the manned vessel. The remote controlled survey vessel is attached to the manned vessel as a precaution on wastewater biosolids lagoons/cells due to plant growth and debris on the surface.
 - 1.3.1 The Tobermory Biosolids Cell #2 had an extensive amount of aquatic plant life both on the surface and below the surface so much so it impacted the outboard motor of the manned vessel. To complete the hydrographic survey, PW MAKAR’s sonar technician had to manually row the remote controlled survey vessel and manned vessel. Our vessel motor operator and safety advisor was on shore monitoring the events.



1.3.1.1

Figure #1. Remote controlled, unmanned survey vessel, attached to manned vessel, in the Tobermory wastewater-biosolids Cells.

- 1.4 The precision navigation was provided by the survey vessels on-board GPS system and is incorporated with the acoustic profiling system. Processing of the acoustic data provides both an indication of the present fluid depth and an image of the extent of

biosolids between the fluid bottom (upper biosolids surface contour bathymetric) and the liner/clay bottom (sub-bottom liner/clay contour) of the Tobermory Biosolids Cell #2.

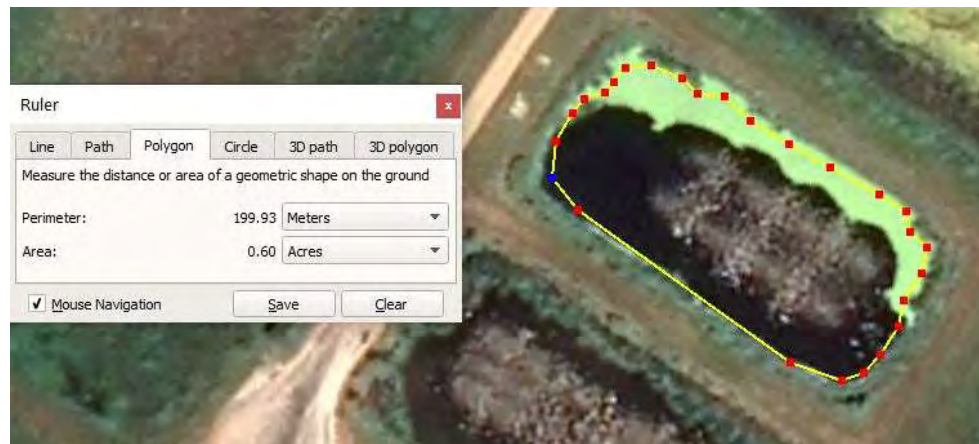
2.0 SITE DESCRIPTION

2.1 The Tobermory wastewater treatment works consists of two (2) wastewater retention – biosolids Cells, Cell #1 primary treatment and Cell #2 secondary treatment.

2.1.1 Both the Cell #1 and Cell #2 were surveyed at this time. Both Cells will have their own hydrographic reports.

2.1 The underwater area surveyed within the Tobermory secondary retention wastewater-biosolids Cell #2 – survey date; July 24, 2020, has an underwater **Positive Planar Area** of **2458.08 m² or 0.60 acres or 0.25 Ha.**

2.1.1.1 **Please note**; the area surveyed within the Tobermory secondary retention wastewater-biosolids Cell #2 is dependent on the water level at the time of the survey. Any obstruction within the lagoon i.e. dykes, aeration systems, rock outcrops above and below the water, aquodic plant life can also affect the size of the survey area.



2.1.2 Figure #2. An area reference qualifier was conducted by a polygon measurement made in Google Earth 7/8/2019 image of the Tobermory Biosolids Cell #2 was found to be approximately 0.60 Acres.¹

2.1.3 The Tobermory Biosolids Cell #2 property is located on the south side of Highway 6, approximately 3.5 kms from the Town of Tobermory, Ontario

3.0 DISCLAIMER

3.1 While PW MAKAR INSPECTION SERVICES LTD believes it has used best practice in obtaining the information contained in this report, in no event will PW MAKAR

¹ Google Earth.
7/8/2019. - Most Current Google Image.

INSPECTION SERVICES LTD be liable for any commercial costs, damages, loss of profit, property damage or personal injury, including death sustained or suffered in connection with the use of data or subsequent processing of materials obtained during field efforts by PW MAKAR INSPECTION SERVICES LTD during this program, or consequential damages including, but not limited to those related to dredging, removal of biosolids, disposal of biosolids, or contamination resulting from use of data obtained from this report or efforts or conclusions drawn from this report.

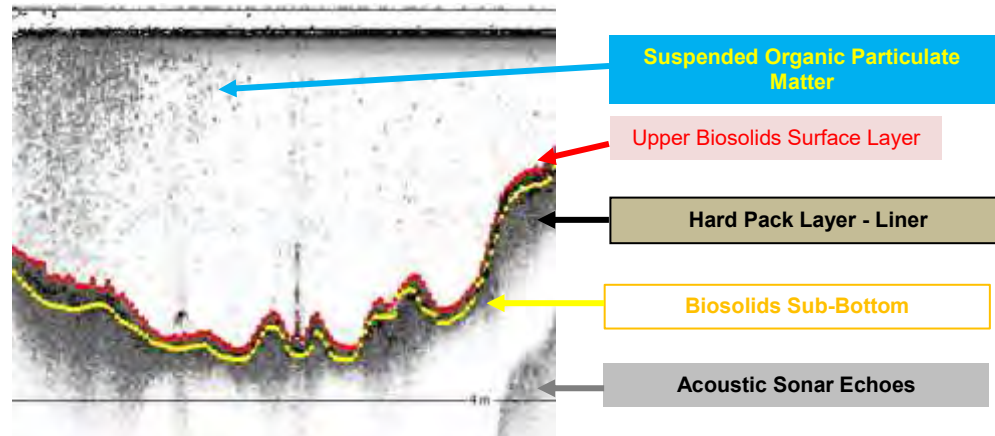
- 3.2 PW MAKAR INSPECTION SERVICES LTD makes no warranty, either expressed or implied, regarding the suitability or fitness of any data or information contained in this report for a particular purpose or that the information will satisfy the requirement of any law, rule, specification, or contract.
- 3.3 The maximum liability of PW MAKAR INSPECTION SERVICES LTD. from all causes related to this work, field efforts, report or discussions about this effort is limited to the funding received by PW MAKAR INSPECTION SERVICES LTD for this work. Acceptance of this report signifies acceptance of this disclaimer.
- 3.4 This report shall be deemed accepted if no protest is received within 60 days of the issuance date of this report.

4.0 ABSTRACT

- 4.1 The shallow hydrographic underwater acoustic sonar survey was conducted on July 24, 2020, and this report reflects the water content and biosolids sludge levels at the time of this hydrographic survey.
- 4.2 The hydrographic survey was performed by PW MAKAR INSPECTION SERVICES LTD's, Sonar Technician, the survey complies with IHO (International Hydrographic Organization) Standards.
- 4.3 Transducer sound calibration checks were performed prior to the start of the hydrographic survey in the Tobermory Biosolids Cell #2.
- 4.4 Biosolids samples were requested, they were obtain at different locations throughout from Cell #2 and put sample bottles supplied by OCWA.

5.0 BIOSOLIDS DEPTH EVALUATIONS

- 5.1 The sub-bottom contour in the Tobermory Biosolids Cell #2, has a "hard pack" sub-bottom layer i.e. clay, hard pack soil. All three of our hydrographic acoustic sonar transducers were utilized to determine the bathymetric bottom and sub-bottom in the lagoon.
 - 5.1.1 Biosolids Isopach, volume computations were calculated from the bathymetric (upper surface) biosolids sludge layer using the 200 kHz transducer and the sub-bottom hard pack layer/liner utilizing both the 50 kHz and 12 kHz transducers.



5.1.2 Figure #3. Post processing of the digitized acoustic sonar signal echoes, July 2020, Tobermory Biosolids Cell #2.

5.2 The water level elevation was appropriate for conducting a hydrographic survey; extensive aquodic plant life was present within the Tobermory Biosolids Cell #2.

5.2.1 There was adequate access and egress into Cell #2 at the time of the survey.

5.2.2 The total volume of biosolids surveyed on July 24, 2020 in the Tobermory Biosolids Cell #2, – is approximately **391.84 m³ or 512.50 yd³**.

5.2.2.1 To calculate a percentage of biosolids sludge, a grid volume computation was calculated from the bathymetric biosolids sludge bottom (defined as the top of the biosolids sludge) and the sub-bottom of the biosolids sludge i.e. the top of the lagoon/cell liner. It is then divided by the grid volume computation calculated from the top of the liquid/water to the sub-bottom of the biosolids sludge of the lagoon/cell liner. The two number sets are then times (x) by 100 to determine a percentage of the biosolids.

Please note; the percentages of biosolids volumes will change/increase if water levels in the lagoon/cell fluctuate. In addition, if aluminum sulfate is added to the water and the suspended organic particles settles to the bottom this will add to the amount of biosolids sludge.

As well; the aeration mixing system was turned off for a period of 6 days prior to the hydrographic survey, there was still suspended organic matter in the water column of Cell #2 which would increase in the total amount of sludge if the suspended organic matter were to completely settle.

5.2.2.1.1 Therefore, on this date the percentage of biosolids buildup in the Tobermory Biosolids Cell #2 is approximately **6.55%**.

5.2.3 PW MAKAR Inspection Services Ltd. collected **22,570** digitized data value points in the Tobermory Biosolids Cell #2. The digitized data value points represent both the bathymetric bottom and sub-bottom biosolids values with GPS navigational values.

5.2.3.1 Each individual data value point consists of an XYZ value. X value is an Easting coordinate; Y value is a Northing coordinate and Z consists of a biosolids/sludge elevation processed in meters.

5.2.3.2 The average depth of biosolids sludge throughout the Tobermory Biosolids Cell #2 on this date was approximately **0.159 m or 159 mm or 6.25 in.**

6.0 GENERAL SITE EVALUATIONS

- 6.1 There is a heavy amount of short vegetation growing around the top of the beam of the wastewater lagoons, which should be monitored and cut back as required if not being allocated already.
- 6.2 There is extensive aquodic plant life was present within the Tobermory Biosolids Cell #2.
- 6.3 There were no apparent berm erosion issues identified at this time.
- 6.4 Lagoon warning signage appeared appropriate.

Reported by: Paul Makar
Paul Makar

PW MAKAR COATINGS INSPECTION LTD. NACE CERTIFIED COATINGS INSPECTOR #137.

Grid Volume Computations

Bathymetric (Upper) Biosolids Surface and Sub-Bottom (Lower) – Liner Surface.

Tobermory secondary retention wastewater-biosolids Cell #2.

Tue Aug 4 15:28:28 2020

Upper Surface

Grid File Name: C:\A Layer Mapping\CELL 2 A LAYER BLANKED out.grd
Grid Size: 87 rows x 100 columns

X Minimum: 449002.78
X Maximum: 449077.63
X Spacing: 0.75606060606037

Y Minimum: 5009033.35
Y Maximum: 5009098.31
Y Spacing: 0.75534883720887

Z Minimum: -3.6466769116936
Z Maximum: -0.33875893332183

Lower Surface

Grid File Name: C:\B Layer Mapping\CELL 2 - B LAYER BLANKED out.grd
Grid Size: 87 rows x 100 columns

X Minimum: 449002.78
X Maximum: 449077.63
X Spacing: 0.75606060606037

Y Minimum: 5009033.35
Y Maximum: 5009098.31
Y Spacing: 0.75534883720887

Z Minimum: -3.6988725333469
Z Maximum: -0.39013566397471

Volumes

Z Scale Factor: 1

Total Volumes by:

Trapezoidal Rule: 391.63094297646
Simpson's Rule: 392.01246675622
Simpson's 3/8 Rule: 392.02655423716

Cut & Fill Volumes

Positive Volume [Cut]: 391.84174219581 m³ or 512.50 yd³.

Negative Volume [Fill]: 0.21079921935185
Net Volume [Cut-Fill]: 391.63094297646

Areas

Planar Areas

Positive Planar Area [Cut]: 2458.0876401037 m² or 0.60 acres or 0.25 Ha.

Negative Planar Area [Fill]: 9.0189983719641
No Data Planar Area: 2395.1493615201
Total Planar Area: 4862.2559999957

Surface Areas

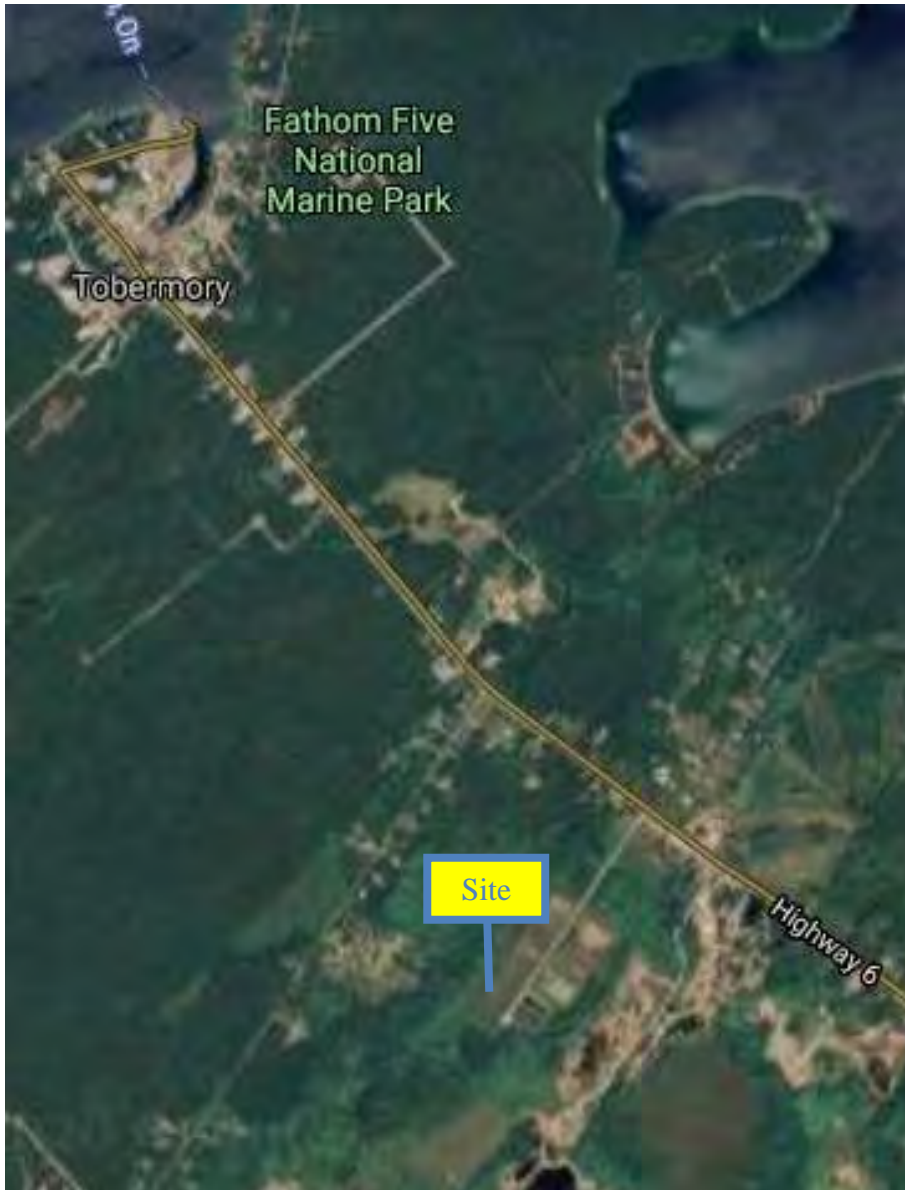
Positive Surface Area [Cut]: 2475.0869017594
Negative Surface Area [Fill]: 9.2495263915813



Appended Figures and Maps



<p>PW MAKAR INSPECTION SERVICES LTD. HAS A LICENSING AGREEMENT WITH GOOGLE INC. TO REPRODUCE AND PUBLISH THE FOLLOWING IMAGE. NO FURTHER REPRODUCTION OR PUBLISHING OF THIS IMAGE IS PERMITTED UNLESS WRITTEN CONSENT FROM PW MAKAR INSPECTION SERVICES LTD.</p>	<p>SITE MAP LOCATION</p> <p>Ontario Clean Water Agency Tobermory, On Tobermory Secondary Wastewater Biosolids Cell #2.</p>
<p>DATE: July 24, 2020</p>	<p>FIGURE No.4</p>



PW MAKAR INSPECTION SERVICES LTD. HAS A LICENSING AGREEMENT WITH GOOGLE INC. TO REPRODUCE AND PUBLISH THE FOLLOWING IMAGE. NO FURTHER REPRODUCTION OR PUBLISHING OF THIS IMAGE IS PERMITTED UNLESS WRITTEN CONSENT FROM PW MAKAR INSPECTION SERVICES LTD.

**SITE AERIAL AP
LOCATION**

Ontario Clean Water Agency
Tobermory, On
Tobermory Secondary
Wastewater Biosolids Cell #2.

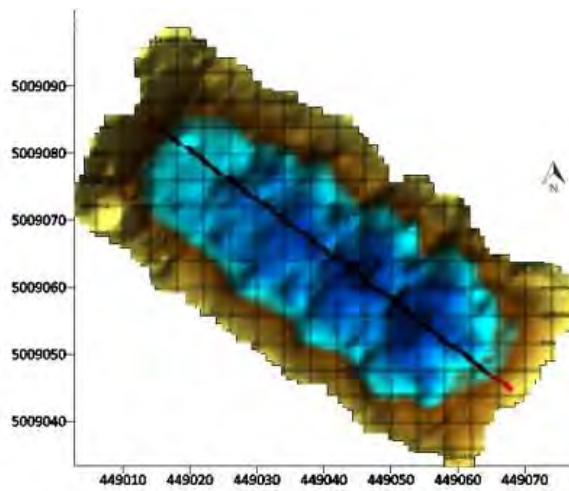
DATE; July 24, 2020

FIGURE No.5

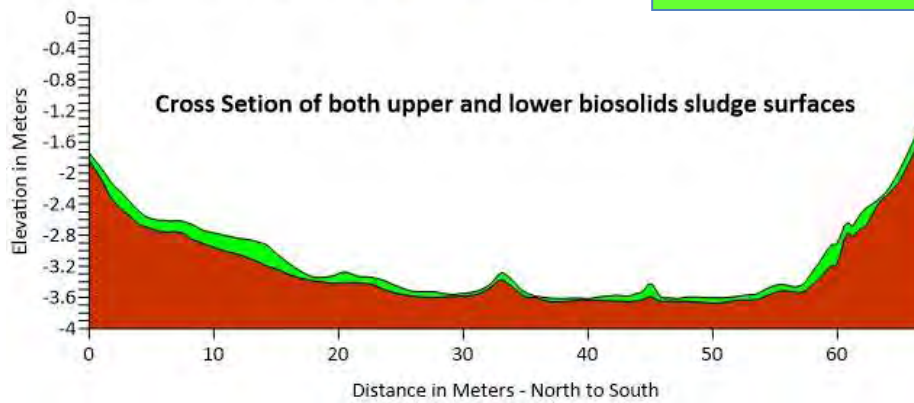
Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Secondary Retention - Cell #2.**

Visual Representation of the Biosolids Sludge Layers
 Sliced from North to South



The average depth of Biosolids Sludge
 in the Tobermory Cell #2 is 0.159 m or
 159 mm or 6.25 in.



Visual Representation of the Biosolids Sludge Layers
 Sliced from North to South

Ontario Clean Water Agency
 Tobermory, Ontario
 Tobermory WWTP

Survey Date: July 24, 2020.

FIGURE No.6

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Secondary Retention - Cell #2.**

Georeferencing Image and Hydrographic Survey Vessel Tracking Lines



**Georeferencing Image and Hydrographic Survey Vessel
Tracking Lines**

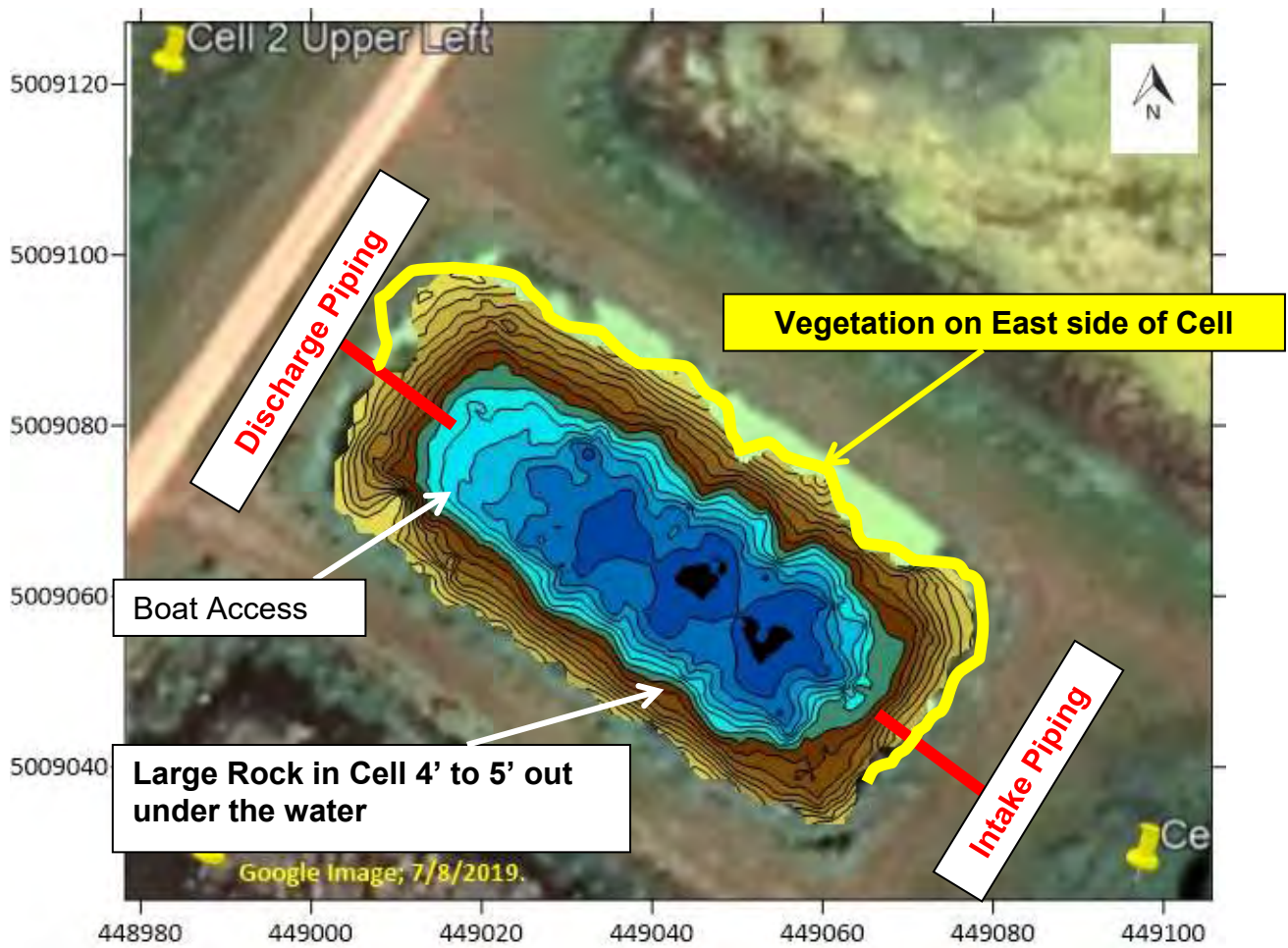
**Ontario Clean Water Agency
Tobermory, Ontario
Tobermory WWTP**

Plot #1

Survey Date: July 23, 2020.

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Secondary Retention - Cell #2.
 Georeferencing Image – Site Description**



Georeferencing Image – Site Description

**Ontario Clean Water Agency
 Tobermory, Ontario
 Tobermory WWTP**

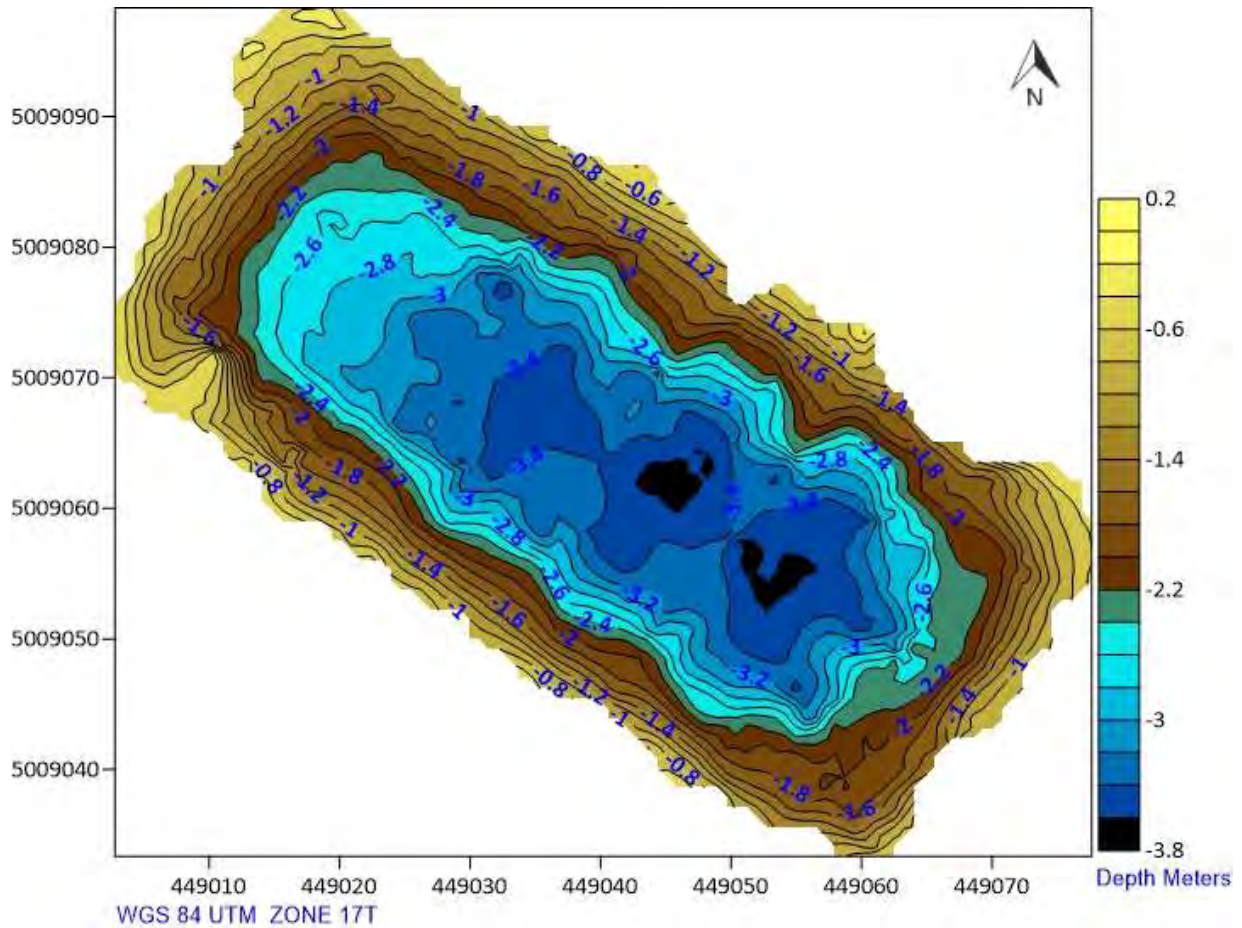
Plot #2

Survey Date: July 23, 2020.

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Secondary Retention - Cell #2.**

Bathymetric Upper Biosolids Sludge Surface – Contour Map



Bathymetric (Upper Surface) Biosolids Distribution – Contour Map

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Secondary
 Wastewater Biosolids Cell #2.

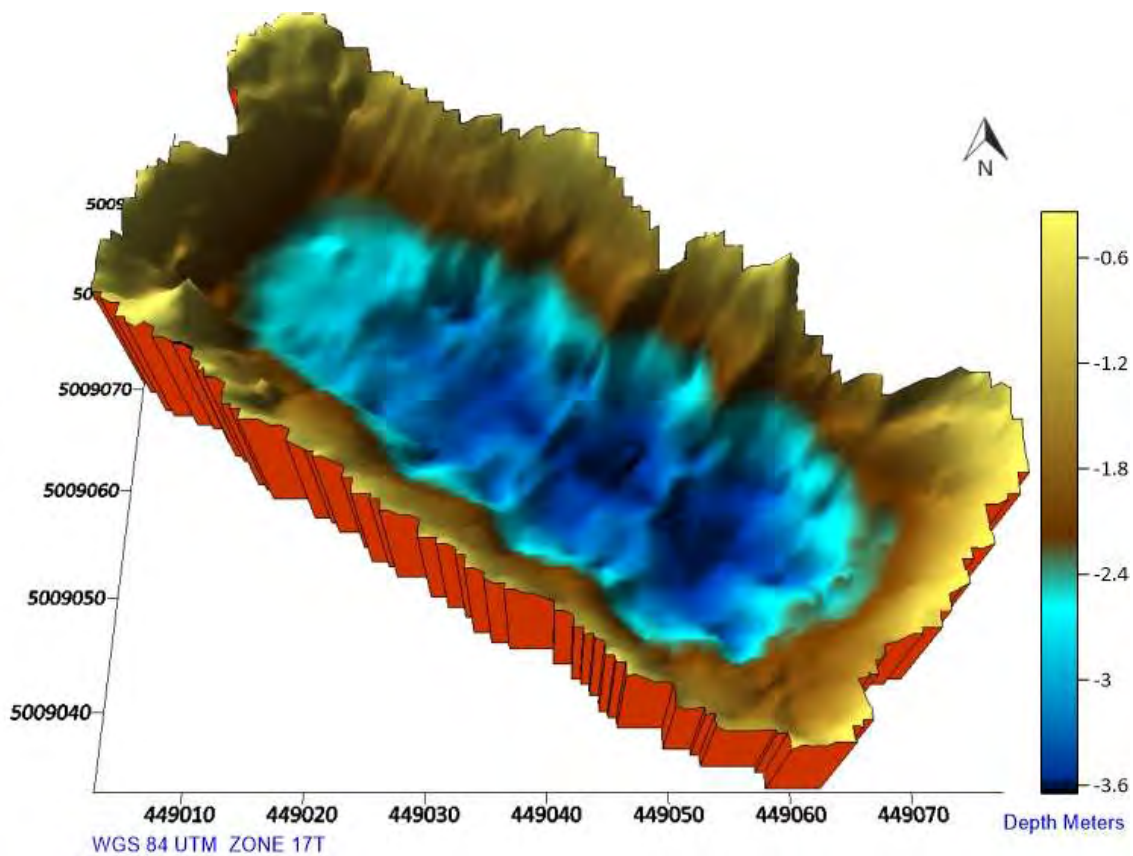
Plot #3

DATE: July 23, 2020

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Secondary Retention - Cell #2.**

Bathymetric Upper Biosolids Sludge Surface – 3D Contour Map



Bathymetric (Upper Surface) Biosolids Distribution – 3D Contour Map

Ontario Clean Water Agency
Tobermory, On
Tobermory Secondary
Wastewater Biosolids Cell #2.

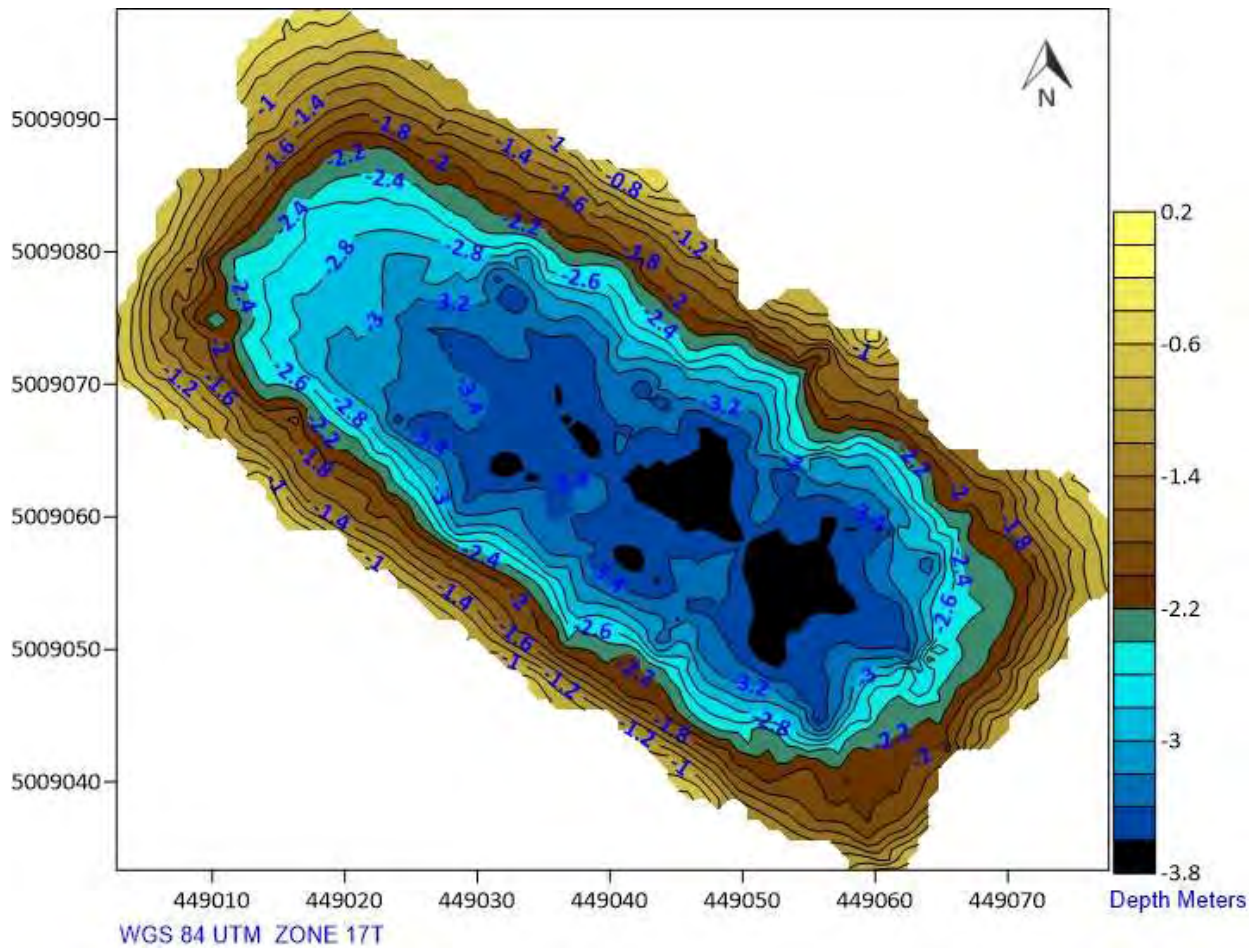
Plot #4

DATE: July 23, 2020

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Secondary Retention - Cell #2.**

Lower Sub-Bottom Liner Surface – Contour Map



Lower Sub-Bottom (Liner/Clay/Hard Packed Soil) – Contour Map

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Secondary
 Wastewater Biosolids Cell #2.

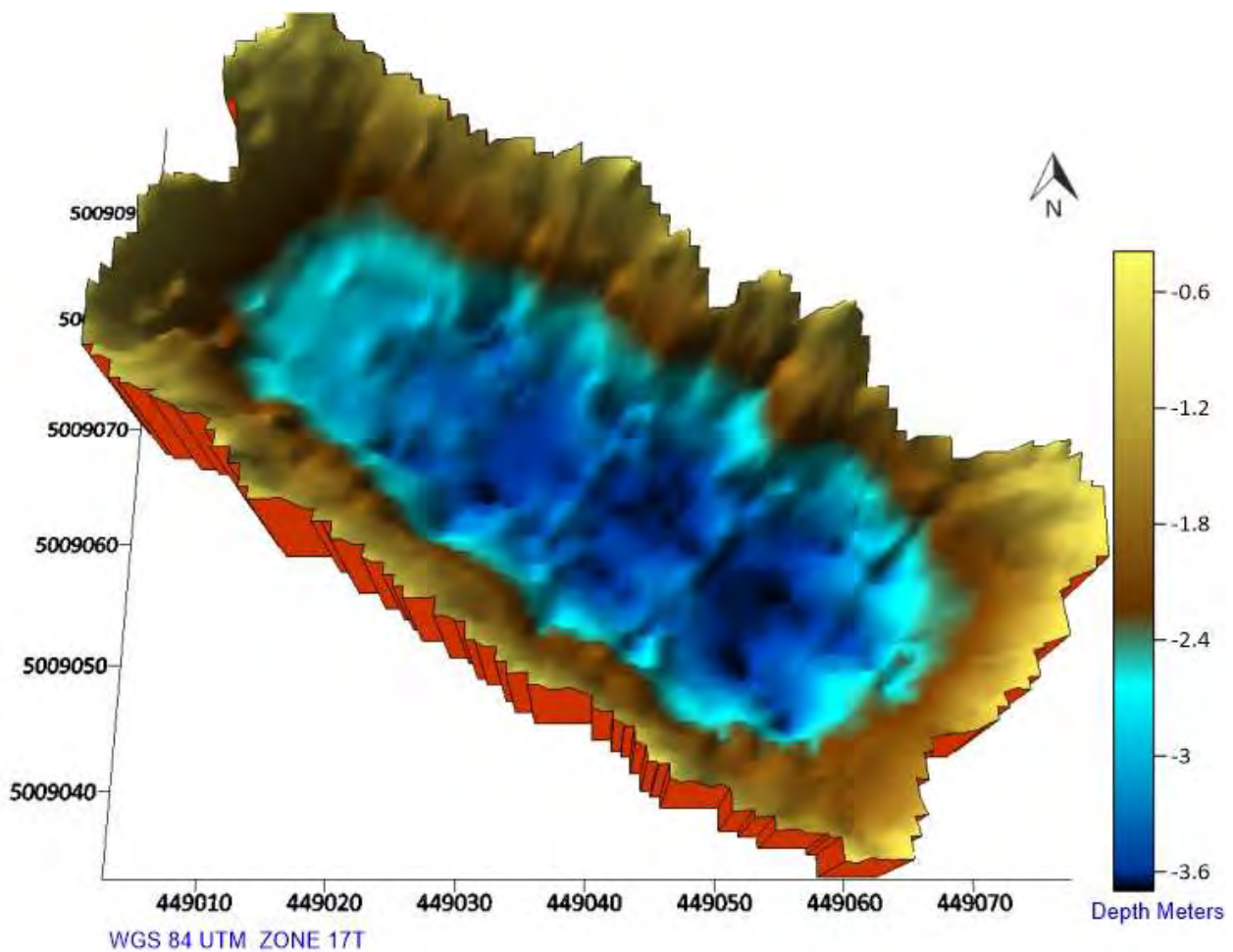
Plot #5

DATE: July 23, 2020

Ontario Clean Water Agency
 Municipality of Northern Bruce Peninsula
 County of Bruce
 Tobermory, Ontario

**Tobermory Wastewater
 Biosolids Secondary Retention - Cell #2.**

Lower Sub-Bottom Liner Surface – 3D Contour Map



Lower Sub-Bottom (Liner/Clay/Hard Packed Soil) – 3D Contour Map

Ontario Clean Water Agency
 Tobermory, On
 Tobermory Secondary
 Wastewater Biosolids Cell #2.

Plot #6

DATE: July 23, 2020

Ontario Clean Water Agency
Municipality of Northern Bruce Peninsula
County of Bruce
Tobermory, Ontario

**Tobermory Wastewater
Biosolids Secondary Retention - Cell #2.**

Hydrographic Acoustic Sonar
Biosolids Volume Modeling and Distribution Survey

Date; July 24, 2020

PICTORIAL REPORT



Digital image #1 – Tobermory Cell #2. – Aquatic plant life on the surface of Cell 2.



Digital image #2 – Tobermory Cell #2. – Aquatic plant life on the surface of Cell 2.

SAFETY PARTNERSHIP TASC		KEY STEPS
Company: <u>PLW MAKAR</u>	Date: <u>July 21 2020</u>	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together. 3. Keep the card with the crew at all times. 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor. 7. If you have questions, "ASK".
Employee: <u>JAN WILLOK</u>	Emergency # <u>911</u>	
Foreman: <u>JAN WILLOK</u>	Wind Direction: <u>SW</u>	
Job Location: <u>TOBERMORGY LAGOON</u>	Emergency assembly location: <u>TRUCK</u>	
Do you require a permit for your work today? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Permit # _____		
Special requirements? <u>COVID TEST, PPE</u>		
Did you sign into the unit? <u>N/A</u>		
Will weather conditions affect your work today? <u>NO</u>		
Is there a heat/cold stress issue today? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Humidex <u>35</u>		
Where is the nearest eye wash station? <u>TRUCK</u>		
Did you inspect your tools and equipment? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Could your activities impact you or others? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
<input type="checkbox"/> tiered work <input type="checkbox"/> overhead lifting <input type="checkbox"/> hot work <input type="checkbox"/> other _____		
Who is your site rep for emergency reporting? <u>LEO-PAUL FRICAULT</u>		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Workers Names:		<p>It only takes a <i>minute</i> to prevent a <i>lifetime</i> of pain</p>
<u>JAN WILLOK</u>		
<u>GREG CHAMBERLAIN</u>		

Describe your task today: <u>SUNAR CELL 1 and 2</u>	Did you visually inspect job-site BEFORE STARTING WORK? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
	Any issues? <u>DEBRIS, ACCESS</u>	
Job Steps	Hazards	Controls
<u>ACCESS LAGOON</u>	<u>WILDLIFE</u>	<u>WATCH STEPS and Driving</u>
<u>PUT VENT/DIAT IN CELL</u>	<u>SLIP, TRIP, FALLS</u>	<u>USE Ropes, Rely on Partner</u>
<u>SUNAR CELL</u>	<u>DEBRIS, UNSANITARY WATER</u>	<u>WEAR PPE, TAKE TIME</u>

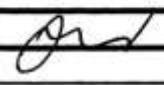
MEMORY JOGGER (EXAMPLES to help complete above section)		
Job Steps	Hazards	Controls
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards
<input type="checkbox"/> scan job site <input type="checkbox"/> get required tools/equipment <input type="checkbox"/> perform/ complete task <input type="checkbox"/> dismantle equipment <input type="checkbox"/> clean up job site	<input type="checkbox"/> unfamiliar process system <input type="checkbox"/> spill/release <input type="checkbox"/> cords, cables, tools <input type="checkbox"/> dropping tools <input type="checkbox"/> thermal burns	<input type="checkbox"/> lockout/ tagout <input type="checkbox"/> tie-off <input type="checkbox"/> lines drained/purged <input type="checkbox"/> shoring <input type="checkbox"/> fire extinguisher
Is housekeeping complete? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Supervisors Signature: <u>[Signature]</u>	
Is permit signed off? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Feedback: _____	

SAFETY PARTNERSHIP TASC		KEY STEPS
Company: <u>PW MAKAR</u>	Date: <u>JULY 22 2020</u>	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together. 3. Keep the card with the crew at all times. 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor. 7. If you have questions, "ASK".
Employee: <u>JOEL WILLOCK</u>	Emergency # <u>911</u>	
Foreman: <u>JOEL WILLOCK</u>	Wind Direction: <u>NW</u>	
Job Location: <u>TOBERMORY LAGOONS</u>	Emergency assembly location: <u>TRUCK</u>	
Do you require a permit for your work today? Yes <input type="radio"/> No <input checked="" type="radio"/> Permit # _____		
Special requirements? <u>COVID TEST, PPE</u>		
Did you sign into the unit? <u>N/A</u>		
Will weather conditions affect your work today? <u>YES - RAIN</u>		
Is there a heat/cold stress issue today? Yes <input type="radio"/> No <input checked="" type="radio"/> Humidex _____		
Where is the nearest eye wash station? <u>TRUCK</u>		
Did you inspect your tools and equipment? Yes <input checked="" type="radio"/> No <input type="radio"/>		
Could your activities impact you or others? Yes <input type="radio"/> No <input checked="" type="radio"/>		
<input type="radio"/> tiered work <input type="radio"/> overhead lifting <input type="radio"/> hot work <input type="radio"/> other _____		
Who is your site rep for emergency reporting? <u>LEO-PAUL FRIGAULT</u>		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? Yes <input checked="" type="radio"/> No <input type="radio"/>		
Workers Names:		It only takes a <i>minute</i> to prevent a <i>lifetime</i> of pain
<u>JOEL WILLOCK</u>		
<u>GREG CALMERS</u>		

Describe your task today: <u>SMAR CELL 1 and 2</u>	Did you visually inspect job-site BEFORE STARTING WORK? Yes <input checked="" type="radio"/> No <input type="radio"/>	
	Any issues? <u>DEBRIS, ACCESS</u>	
Job Steps	Hazards	Controls
<u>Put Vessel in water</u>	<u>Slips, Trips, Falls</u>	<u>Watch Step, Use Puck</u>
<u>Swim Lagoon</u>	<u>Debris, Unsanitary Water</u>	<u>Watch splashes, Clean Propeller.</u>
<u>Remove Vessel</u>	<u>Injury, Falls</u>	<u>Watch Rocks, Use Ropes to Remove equipment.</u>

MEMORY JOGGER (EXAMPLES to help complete above section)		
Job Steps	Hazards	Controls
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards
<ul style="list-style-type: none"> o scan job site o get required tools/equipment o perform/ complete task o dismantle equipment o clean up job site 	<ul style="list-style-type: none"> o unfamiliar process system o spill/release o cords, cables, tools o dropping tools o thermal burns 	<ul style="list-style-type: none"> o lockout/ tagout o tie- off o lines drained/purged o shoring o fire extinguisher
Is housekeeping complete? Yes <input checked="" type="radio"/> No <input type="radio"/>	Supervisors Signature: <u>[Signature]</u>	
Is permit signed off? Yes <input checked="" type="radio"/> No <input type="radio"/>	Feedback: _____	

SAFETY PARTNERSHIP TASC		KEY STEPS
Company: <u>PW MAKAR</u>	Date: <u>July 23 2020</u>	<ol style="list-style-type: none"> 1. Complete card at the job site 2. If in a crew, complete together, 3. Keep the card with the crew at all times 4. If conditions change, the card must be reviewed with the whole crew. 5. Identify Job steps, hazards in your work area, and controls on the back of the card. 6. When job is complete return card to the supervisor 7. If you have questions, "ASK".
Employee: <u>JOEL WILLOCK</u>	Emergency # <u>911</u>	
Foreman: <u>JOEL WILLOCK</u>	Wind Direction: <u>SW</u>	
Job Location: <u>TORONTO MARY LAGOON</u>	Emergency assembly location: <u>TRUCK</u>	
Do you require a permit for your work today? Yes <input checked="" type="radio"/> No <input type="radio"/> Permit # _____		
Special requirements? <u>COVID TEST, PPE</u>		
Did you sign into the unit? <u>N/A</u>		
Will weather conditions affect your work today? <u>NO</u>		
Is there a heat/cold stress issue today? <input checked="" type="radio"/> Yes <input type="radio"/> No Humidex <u>36</u>		
Where is the nearest eye wash station? <u>TRUCK</u>		
Did you inspect your tools and equipment? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Could your activities impact you or others? Yes <input checked="" type="radio"/> No <input type="radio"/>		
<input type="radio"/> tiered work <input type="radio"/> overhead lifting <input type="radio"/> hot work <input type="radio"/> other <u>N/A</u>		
Who is your site rep for emergency reporting? <u>Leo-Paul Frigault</u>		
Did you sign off the permit today? Yes / No		
Are you mentally/ physically prepared to complete this job? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Workers Names:		<p>It only takes a <i>minute</i> to prevent a <i>lifetime</i> of pain</p>
<u>JOEL WILLOCK</u>		
<u>GREG CHALMERS</u>		

Describe your task today: SUNAR CELL 1 and 2		Did you visually inspect job-site BEFORE STARTING WORK?: <input checked="" type="radio"/> Yes <input type="radio"/> No	
Any issues? DEBRIS, ACCESS			
Job Steps	Hazards	Controls	
Insert Vessel into Cell	TRIP, Slips, Falls	TAKE TIME, Communicate	
Move Vessel / BOAT to Cell 2 (very cells)	Falls	Watch Step, Communicate	
	Debris, Unmanned Debris	PPE, TAKE TIME	
Remove vessel / BOAT	TRIP, Muscle Pull	use Ropes, Truck, Rely on Partners	
MEMORY JOGGER (EXAMPLES to help complete above section)			
Job Steps	Hazards	Controls	
Describe steps to reveal hazards	Each step could have many hazards	Control or Eliminate all Hazards	
<ul style="list-style-type: none"> o scan job site o get required tools/equipment o perform/ complete task o dismantle equipment o clean up job site 	<ul style="list-style-type: none"> o unfamiliar process system o spill/release o cords, cables, tools o dropping tools o thermal burns 	<ul style="list-style-type: none"> o lockout/ tagout o tie- off o lines drained/purged o shoring o fire extinguisher 	
Is housekeeping complete? <input checked="" type="radio"/> Yes <input type="radio"/> No	Supervisors Signature: 		
Is permit signed off? <input checked="" type="radio"/> Yes <input type="radio"/> No	Feedback: _____		