



Ontario Clean Water Agency Agence Ontarienne Des Eaux

March 29, 2018

John Ritchie, Water Compliance Supervisor
John.S.Ritchie@ontario.ca
Ministry of the Environment and Climate Change
3rd floor, 101 17th Street East
Owen Sound, Ontario
N4K 0A5

RE: 2017 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 2017 Annual Performance Report for the Tobermory Sewage Treatment System which covers the reporting period of January 1, 2017 to December 31, 2017. 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 blue ink, appearing to read "Leo-Paul Frigault".

Leo-Paul Frigault
Senior Operations Manager
Ontario Clean Water Agency, Georgian Highlands Region

cc: Troy Cameron I, Public Works and Property Manager, Municipality of Northern Bruce Peninsula



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

TOBERMORY
SEWAGE TREATMENT FACILITY

ANNUAL PERFORMANCE REPORT

For the period of
JANUARY 1, 2017 TO DECEMBER 31, 2017

Prepared by the Ontario Clean Water Agency
For The Corporation of 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. The capacity of aeration cells #1 and #2 is 10,800 m³ each. 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 is also available.

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)
	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	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)	External analysis
		Annual in August (for OW-6S, OW-6I, OW-6D, OW-7S, OW-9S, OW-9I, OW-9D, OW-10S, OW-11S, OW-12S)	
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 and Climate Change, MOECC)

2.1 Discharge Data Report (MOECC)

The Ontario Clean Water Agency (OCWA) has an agreement with the MOECC 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 MOECC has these reports stored in a shared location where MOECC 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 provides effluent that met all the effluent objectives set out in the C of A. Based on this, the current sewage treatment program is deemed adequate. OCWA continues to work towards staying within effluent objectives 100% of the time 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 1. 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

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 (WISKI7). A comparison of the analytical results compared to the effluent objectives can be found in Table 8.

Table 2. 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	8.0	Yes	3.0	Yes
June	13.0	Yes	16.5	Yes
July	6.0	Yes	4	Yes
August	8.0	Yes	47	Yes
September	4.0	Yes	4	Yes
October	5.0	Yes	3	Yes

It is recommended that sludge levels be monitored to determine if sludge management is required. Operators recorded sludge levels on September 12, 2017. The average sludge level in Aeration Cell #1 at that time was 28 inches.

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 total raw sewage flow including hauled septage volumes for 2017 was 89,175 m³ with an annual average daily flow of 244.3 m³/day which is 39.1% of the design capacity of the system. Total and average daily flows for 2017 have decreased in comparison to 2016. 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	147.0
February	155.5
March	134.9
April	205.0
May	261.2
June	282.4
July	403.0
August	415.8
September	291.6
October	216.8
November	222.0
December	188.7

Hauled septage volumes were added to the Sewage Pump Station flows. 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 the average daily flow shown in subsection (a) for any consecutive period of time greater than one year is not approved under this Certificate.

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	1.75	3.6	2.3	0.04	2.2
June	4.26	16.2	13.9	0.795	3.5
July	6.64	22.2	20.7	1.06	2.33
August	9.46	18.3	15.7	0.23	0.34
September	7.57	16.9	16.0	0.33	2.04
October	5.99	6.1	4.8	0.63	4.74

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

	pH				Dissolved Oxygen			
	Cell #1		Cell #2		Cell #1		Cell #2	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
May	6.99	7.63	6.99	7.38	2.68	5.93	4.98	6.35
June	6.59	7.20	6.80	7.34	1.94	5.32	3.77	6.89
July	6.56	7.15	6.54	7.31	0.21	2.14	2.96	4.04
August	6.62	7.20	7.09	7.42	0.49	3.41	3.01	4.06
September	6.85	7.35	7.14	7.65	1.58	5.88	4.43	4.81

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. The DO range for Cell #1 and Cell #2 was between 0.21 and 6.89 in 2017 in comparison to 0.53 to 9.03 in 2016. Overall, the average DO in 2017 (3.62) is slightly less than the average DO in 2016 (4.56).

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 2017.

Due to dry wells, the following samples were not taken:

- Spring (May): OW5-D, OW2-S, OW61, OW8-S
- Summer (August) OW6-S, OW7-S
- Fall (October) OW6-S, OW2-S, OW7-S, OW8-S

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 2017 . the wet well at the Sewage pump station and lagoon chambers were cleaned out.

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.

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 2018, some of which may not require approval under OWRA:

- Generator load test
- Roof and metalwork
- Replacement of heating units to improve energy efficiency
- Installation of MCC (electrical system)
- Blower rebuild
- Manhole repair

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 no. 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. Sludge levels were measured in lagoon cell no. 1 in September of 2017 and current sludge volumes were estimated at approximately 987 m³. The estimated volume of sludge generated during this reporting period is 76m³. It is anticipated that 76 m³ of sludge will be produced during 2018.

8. Sludge Handling

As per Section 15g. of C of A 3-0046-96-006, an *outline of the sludge handing 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 2017, approximately 5,850 m³ (1,286,915 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 12. Detailed haulage volumes can be found in Appendix C.

Table 12. Total Volume of Septage Received in 2017

Month	Total Volume of Septage Received (m ³)
January	12
February	18
March	51
April	205
May	467
June	891
July	1234
August	1560
September	846
October	310
November	232
December	26

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. 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 MAXIMO, upon completion, Operators sign-off and the work order is considered closed.

On May 09, 2017, Flowmetrix performed an annual third party instrument verification of the flow meter at the sewage lift station. All flow meters passed the annual verification all with percent errors of less than 5%. 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 3-0046-96-006an *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 consistently met effluent objectives. 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

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

From: 01/01/2017 to 31/12/2017

Report extracted 03/23/2018 09:18

Facility: [1132] TOBERMORY WASTEWATER TREATMENT FACILITY

Works: [120001577]

	01/2017	02/2017	03/2017	04/2017	05/2017	06/2017	07/2017	08/2017	09/2017	10/2017	11/2017	12/2017	<--Total-->	<--Avg-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Sewage Pumping Station (m ³)	4545.00	4335.00	4131.30	5945.40	7631.40	7580.00	11259.49	11329.50	7902.80	6412.00	6427.00	5825.00	83323.89			
Raw Flow: Avg - Sewage Pumping Station (m ³ /d)	146.61	154.82	133.27	198.18	246.17	252.67	363.21	365.47	263.43	206.84	214.23	187.90		227.73		625.0
Raw Flow: Max - Sewage Pumping Station (m ³ /d)	216.00	599.00	708.00	1144.00	1116.00	799.00	415.33	450.00	347.75	262.50	290.00	216.40			1144.00	



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix B

Groundwater Sampling Program Laboratory Analysis
Results



SGS Canada Inc.

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

OCWA-Southampton (Tobermory Sewage Plant)

Attn : Camille Leung

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

Phone: 519-797-2561
Fax:pdf

Works #: 120001577
Project : PO#017018

30-May-2017

Date Rec. : 25 May 2017
LR Report: CA13602-MAY17

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Approval Date	4: Analysis Approval Time	23: Well 2D-OW2-D (Well 9)	24: Well 55-OW55 (Well 11)	25: Well 7S-OW7-S (Well 25)	26: Well 60-OW60 (Well 14)
Sample Date & Time					24-May-17 10:00	24-May-17 12:00	24-May-17 09:30	24-May-17 11:30
Temperature Upon Receipt [°C]	---	---	---	---	8.0	8.0	8.0	8.0
Alkalinity [mg/L as CaCO3]	25-May-17	15:45	29-May-17	11:11	260	408	241	465
Conductivity [uS/cm]	25-May-17	15:45	29-May-17	11:11	516	735	457	996
pH [no unit]	25-May-17	15:45	29-May-17	11:11	8.01	7.96	8.00	7.57
Temperature @ pH [°C]	25-May-17	15:45	29-May-17	11:11	21.2	21.4	21.4	21.5
Organic Nitrogen [mg/L]	25-May-17	20:00	30-May-17	11:55	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen [as N mg/L]	25-May-17	17:00	29-May-17	11:54	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	25-May-17	20:00	30-May-17	11:55	0.001	< 0.001	< 0.001	< 0.001
Ammonia+Ammonium (N) [mg/L]	25-May-17	20:00	26-May-17	10:08	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	26-May-17	10:34	30-May-17	14:10	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-17	09:44	30-May-17	14:10	1	2	2	2
Phosphorus (dissolved reactive) [mg/L]	25-May-17	16:45	30-May-17	11:27	---	---	< 0.03	---
Chloride [mg/L]	29-May-17	11:28	30-May-17	12:05	1	< 1	2	110
Sulphate [mg/L]	29-May-17	11:23	30-May-17	12:05	19	6	7	6
Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	0.12	< 0.06	0.42
Nitrate + Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	0.12	< 0.06	0.42
Hardness (dissolved) [mg/L as CaCO3]	26-May-17	10:00	29-May-17	13:54	233	442	250	334
Magnesium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	21.9	20.8	19.6	24.1
Calcium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	57.2	143	67.7	94.0
Iron (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	0.096	0.201	0.123	0.237
Sodium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	15.7	0.73	0.70	58.6
Phosphorus (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	---	---	< 0.003	---

Note: Provi nci al uni oni zed amoni a calcul ated usi ng lab resul ts for pH and temperature.



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 : CA13602-MAY17

Carrie Greenlaw
Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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

OCWA-Southampton (Tobermory Sewage Plant)

Attn : Camille Leung

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

Phone: 519-797-2561
Fax:pdf

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30-May-2017

Date Rec. : 25 May 2017
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Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

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Sample Date & Time					24-May-17 10:25	24-May-17 10:15	24-May-17 13:45	24-May-17 13:30	24-May-17 10:45
Temperature Upon Receipt [°C]	---	---	---	---	8.0	8.0	8.0	8.0	8.0
Alkalinity [mg/L as CaCO3]	25-May-17	15:45	29-May-17	11:11	268	339	395	290	367
Conductivity [uS/cm]	25-May-17	15:45	29-May-17	11:11	501	634	734	527	674
pH [no unit]	25-May-17	15:45	29-May-17	11:11	7.79	7.94	8.03	7.51	7.92
Temperature @ pH [°C]	25-May-17	15:45	29-May-17	11:11	19.6	21.5	21.8	20.5	21.4
Organic Nitrogen [mg/L]	25-May-17	20:00	30-May-17	11:55	< 0.05	< 0.05	< 0.05	< 0.05	0.07
Total Kjeldahl Nitrogen [as N mg/L]	25-May-17	17:00	29-May-17	11:54	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	25-May-17	20:00	30-May-17	11:55	0.003	0.001	< 0.001	< 0.001	0.013
Ammonia+Ammonium (N) [mg/L]	25-May-17	20:00	26-May-17	10:08	0.1	< 0.1	< 0.1	< 0.1	0.4
4AAP-Phenolics [mg/L]	26-May-17	10:34	30-May-17	14:10	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-17	09:44	30-May-17	14:10	2	2	3	1	1
Phosphorus (dissolved reactive) [mg/L]	25-May-17	16:45	30-May-17	11:27	---	---	---	---	---
Chloride [mg/L]	29-May-17	11:28	30-May-17	12:05	4	3	1	< 1	2
Sulphate [mg/L]	29-May-17	11:23	30-May-17	12:05	5	5	6	2	7
Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	0.27	0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	0.27	0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	26-May-17	10:00	29-May-17	13:54	224	308	443	259	378
Magnesium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	20.2	26.9	29.1	18.7	30.0
Calcium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	56.4	78.9	129	72.8	102
Iron (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	0.169	0.059	0.010	0.064	0.007
Sodium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	22.8	13.1	0.76	0.58	2.02
Phosphorus (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	---	---	---	---	---

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



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Works #: 120001577
Project : PO#017018
LR Report : CA13602-MAY17

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Project : PO#017018

30-May-2017

Date Rec. : 25 May 2017
LR Report: CA13602-MAY17

Copy: #1

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Start Date	2: Start Time	3: Approval Date	4: Approval Time	5: Well 5S-OW5-S (Well 4)	6: Well 5I-OW5-I (Well 5)	7: Well 9D-OW9-D (Well 20)	8: Well 9I-OW9-I (Well 19)	9: Well 9S-OW9-S (Well 18)	10: Well 8I-OW8-I (Well 16)
Sample Date & Time					24-May-17 11:55	24-May-17 11:45	24-May-17 08:20	24-May-17 08:50	24-May-17 08:35	24-May-17 09:30
Temperature Upon Receipt [°C]	---	---	---	---	8.0	8.0	8.0	8.0	8.0	8.0
Alkalinity [mg/L as CaCO3]	25-May-17	15:45	29-May-17	11:11	293	320	220	236	214	257
Conductivity [uS/cm]	25-May-17	15:45	29-May-17	11:11	662	837	448	493	403	495
pH [no unit]	25-May-17	15:45	29-May-17	11:11	7.54	7.80	7.99	8.00	7.63	7.73
Temperature @ pH [°C]	25-May-17	15:45	29-May-17	11:11	19.3	19.9	19.7	20.3	20.6	19.8
Organic Nitrogen [mg/L]	25-May-17	20:00	30-May-17	11:55	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen [as N mg/L]	25-May-17	17:00	29-May-17	11:54	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	25-May-17	20:00	30-May-17	11:55	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Ammonia+Ammonium (N) [mg/L]	25-May-17	20:00	26-May-17	10:08	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	26-May-17	10:34	30-May-17	14:10	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	26-May-17	09:44	30-May-17	14:10	2	2	< 1	< 1	1	1
Phosphorus (dissolved reactive) [mg/L]	25-May-17	16:45	30-May-17	11:27	< 0.03	---	---	---	< 0.03	---
Chloride [mg/L]	29-May-17	11:28	30-May-17	12:05	38	77	1	2	2	4
Sulphate [mg/L]	29-May-17	11:23	30-May-17	12:05	11	22	15	19	6	13
Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.09
Nitrate + Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.09
Hardness (dissolved) [mg/L as CaCO3]	26-May-17	10:00	29-May-17	13:54	262	282	237	212	242	259
Magnesium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	14.8	17.2	21.4	21.3	19.0	25.1
Calcium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	80.6	84.6	59.7	50.0	65.5	62.5
Iron (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	0.230	0.046	0.031	< 0.007	0.037	0.095
Sodium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	27.2	61.5	2.73	6.16	1.02	2.06
Phosphorus (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	0.012	---	---	---	< 0.003	---

Note: Provi nci al uni oni zed amoni a cal cul ated usi ng lab resul ts for pH and temperature.



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Project : PO#017018

30-May-2017

Date Rec. : 25 May 2017
LR Report: CA13602-MAY17

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Start Date	2: Analysis Start Time	3: Approval Date	4: Approval Time	11: Well 8D-OW8-D (Well 17)	12: Well 10S-OW10-S (Well 23)	13: Well 11S-OW11-S (Well 24)	14: Well 12S-OW12-S (Well 10)	15: Well 1D-OW1-D (Well 22)	16: Well 11-OW1-I (Well 21)	17: Well 6S-OW6-S (Well 1)
Sample Date & Time					24-May-17 09:15	24-May-17 13:05	24-May-17 12:50	24-May-17 11:15	24-May-17 11:00	24-May-17 10:50	24-May-17 10:35
Temperature Upon Receipt [°C]	---	---	---	---	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Alkalinity [mg/L as CaCO3]	25-May-17	15:45	29-May-17	11:11	260	227	297	404	267	385	260
Conductivity [uS/cm]	25-May-17	15:45	29-May-17	11:11	513	401	572	749	504	659	489
pH [no unit]	25-May-17	15:45	29-May-17	11:11	7.63	8.01	8.01	7.62	7.83	7.44	7.93
Temperature @ pH [°C]	25-May-17	15:45	29-May-17	11:11	19.2	20.1	19.8	19.8	20.5	20.4	20.5
Organic Nitrogen [mg/L]	25-May-17	20:00	30-May-17	11:55	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen [as N mg/L]	25-May-17	17:00	29-May-17	11:54	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	25-May-17	20:00	30-May-17	11:55	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ammonia+Ammonium (N) [mg/L]	25-May-17	20:00	26-May-17	10:08	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	26-May-17	10:34	30-May-17	14:10	< 0.002	< 0.002	< 0.002	< 0.002	0.003	0.004	0.005
Dissolved Organic Carbon [mg/L]	26-May-17	09:44	30-May-17	14:10	< 1	2	1	2	< 1	2	2
Phosphorus (dissolved reactive) [mg/L]	25-May-17	16:45	30-May-17	11:27	---	< 0.03	< 0.03	< 0.03	---	---	< 0.03
Chloride [mg/L]	29-May-17	11:28	30-May-17	12:05	5	1	2	19	2	2	1
Sulphate [mg/L]	29-May-17	11:23	30-May-17	12:05	15	15	12	21	9	5	4
Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	1.16	1.03	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	26-May-17	10:15	29-May-17	17:52	< 0.06	< 0.06	1.16	1.03	< 0.06	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	26-May-17	10:00	29-May-17	13:54	272	214	296	353	279	357	251
Magnesium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	24.1	18.4	25.7	23.3	25.0	25.9	27.7
Calcium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	69.1	55.1	76.1	103	70.3	100	54.7
Iron (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	0.028	0.105	0.010	0.022	0.135	0.015	0.044
Sodium (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	1.72	2.77	1.14	14.1	2.22	4.79	0.62
Phosphorus (dissolved) [mg/L]	26-May-17	10:00	29-May-17	13:54	---	< 0.003	< 0.003	< 0.003	---	---	< 0.003

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



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LR Report : CA13602-MAY17

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22-August-2017

Date Rec. : 16 August 2017
LR Report: CA12598-AUG17

Copy: #1

CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	10: Well 10S-OW10-S (Well 23)	11: Well 11S-OW11-S (Well 24)	12: Well 12S-OW12-S (Well 10)
Sample Date & Time					15-Aug-17 09:40	15-Aug-17 09:55	15-Aug-17 10:10
Temperature Upon Receipt [°C]	---	---	---	---	16.0	16.0	16.0
Alkalinity [mg/L as CaCO3]	17-Aug-17	06:27	17-Aug-17	14:37	250	310	351
Conductivity [uS/cm]	17-Aug-17	06:27	17-Aug-17	14:37	402	582	666
pH [no unit]	17-Aug-17	06:27	17-Aug-17	14:37	7.90	7.89	7.49
Temperature @ pH [°C]	17-Aug-17	06:27	17-Aug-17	14:37	16.2	18.8	18.0
Organic Nitrogen [mg/L]	16-Aug-17	17:49	21-Aug-17	15:06	< 0.5	< 0.5	< 0.5
Phosphorus (total) [mg/L]	17-Aug-17	08:30	18-Aug-17	09:27	0.76	< 0.03	0.08
Total Kjeldahl Nitrogen [as N mg/L]	16-Aug-17	17:49	17-Aug-17	15:03	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	18-Aug-17	07:40	21-Aug-17	15:07	0.005	<0.002	0.002
Ammonia+Ammonium (N) [mg/L]	18-Aug-17	07:40	21-Aug-17	15:06	0.2	< 0.1	0.2
4AAP-Phenolics [mg/L]	17-Aug-17	13:30	18-Aug-17	11:05	< 0.002	0.004	< 0.002
Dissolved Organic Carbon [mg/L]	17-Aug-17	07:10	18-Aug-17	16:18	3	< 1	1
Phosphorus (dissolved reactive) [mg/L]	16-Aug-17	19:04	18-Aug-17	13:27	< 0.03	< 0.03	< 0.03
Chloride [mg/L]	18-Aug-17	08:24	18-Aug-17	14:45	1	1	15
Sulphate [mg/L]	18-Aug-17	08:25	18-Aug-17	14:45	15	12	21
Nitrite (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.06	1.15	0.35
Nitrate + Nitrite (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.06	1.15	0.35
Hardness [mg/L as CaCO3]	18-Aug-17	15:00	21-Aug-17	14:07	232	337	360
Magnesium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	22.0	29.6	24.0
Calcium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	56.7	86.1	105
Iron (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	0.024	< 0.007	0.013
Phosphorus (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	< 0.003	< 0.003	< 0.003
Sodium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	3.38	1.46	18.5

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



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22-August-2017

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LR Report: CA12598-AUG17

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CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: Well 6I-OW6-I (Well 3)	6: Well 6D-OW6-D (Well 2)	7: Well 9S-OW9-S (Well 18)	8: Well 9I-OW9-I (Well 19)	9: Well 9D-OW9-D (Well 20)
Sample Date & Time					15-Aug-17 10:20	15-Aug-17 10:15	15-Aug-17 11:00	15-Aug-17 10:50	15-Aug-17 10:50
Temperature Upon Receipt [°C]	---	---	---	---	16.0	16.0	16.0	16.0	16.0
Alkalinity [mg/L as CaCO3]	17-Aug-17	06:27	17-Aug-17	14:37	334	263	256	238	225
Conductivity [uS/cm]	17-Aug-17	06:27	17-Aug-17	14:37	608	514	477	498	444
pH [no unit]	17-Aug-17	06:27	17-Aug-17	14:37	7.65	8.00	7.89	8.13	7.98
Temperature @ pH [°C]	17-Aug-17	06:27	17-Aug-17	14:37	18.5	18.9	18.5	18.4	18.2
Organic Nitrogen [mg/L]	16-Aug-17	17:49	21-Aug-17	15:06	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phosphorus (total) [mg/L]	17-Aug-17	08:30	18-Aug-17	09:27	---	0.06	0.10	---	---
Total Kjeldahl Nitrogen [as N mg/L]	16-Aug-17	17:49	17-Aug-17	15:03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	18-Aug-17	07:40	21-Aug-17	15:07	0.002	0.011	0.007	<0.003	<0.002
Ammonia+Ammonium (N) [mg/L]	18-Aug-17	07:40	21-Aug-17	15:06	0.1	0.3	0.2	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	17-Aug-17	13:30	18-Aug-17	11:05	< 0.002	0.002	< 0.002	0.003	< 0.002
Dissolved Organic Carbon [mg/L]	17-Aug-17	07:10	18-Aug-17	16:18	1	1	4	< 1	< 1
Phosphorus (dissolved reactive) [mg/L]	16-Aug-17	19:04	18-Aug-17	13:27	---	< 0.03	< 0.03	---	---
Chloride [mg/L]	18-Aug-17	08:24	18-Aug-17	14:45	3	3	3	3	1
Sulphate [mg/L]	18-Aug-17	08:25	18-Aug-17	14:45	9	7	5	20	15
Nitrite (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	18-Aug-17	12:54	22-Aug-17	12:44	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hardness [mg/L as CaCO3]	18-Aug-17	15:00	21-Aug-17	14:07	364	253	282	241	251
Magnesium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	34.3	24.2	23.7	26.0	25.7
Calcium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	89.3	61.2	74.1	53.9	58.1
Iron (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	< 0.007	0.064	0.015	< 0.007	0.016
Phosphorus (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Sodium (dissolved) [mg/L]	18-Aug-17	15:00	21-Aug-17	14:07	7.21	22.7	1.39	8.46	3.90

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



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Project : PO#017018

30-October-2017

Date Rec. : 20 October 2017
LR Report: CA15384-OCT17

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Table with 13 columns: Analysis, 1: Analysis Start Date, 2: Analysis Start Time, 3: Analysis Approval Date, 4: Analysis Approval Time, 19: Well 61, 20: Well 57, 21: Well 56, 22: Well 21, 23: Well 2D, 24: Well 55, 25: Well 60, 26: Well 61. Rows include various chemical and physical parameters like Temperature, Alkalinity, pH, Nitrogen, Phosphorus, etc.

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



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Phone: 705-652-2000 FAX: 705-652-6365

Works #: 120001577
Project : PO#017018
LR Report : CA15384-OCT17

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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OCWA-Southampton (Tobermory Sewage Plant)

Attn : Megan Edney

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

Phone: 519-797-2561
Fax:pdf

Works #: 120001577
Project : PO#017018

30-October-2017

Date Rec. : 20 October 2017
LR Report: CA15384-OCT17

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	11: Well 81	12: Well 8D	13: Well 10S	14: Well 11S	15: Well 12S	16: Well 1D	17: Well 11	18: Well 6D
Sample Date & Time					19-Oct-17 11:40	19-Oct-17 11:30	19-Oct-17 10:00	19-Oct-17 09:50	19-Oct-17 14:40	19-Oct-17 14:30	19-Oct-17 14:15	19-Oct-17 13:40
Temperature Upon Receipt [°C]					15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Alkalinity [mg/L as CaCO3]	20-Oct-17	14:36	26-Oct-17	15:06	241	260	247	295	328	236	364	428
Conductivity [uS/cm]	20-Oct-17	14:36	26-Oct-17	15:06	491	514	403	574	665	451	608	1030
pH [no unit]	20-Oct-17	14:36	26-Oct-17	15:06	7.90	7.99	7.99	7.83	7.86	8.31	8.23	7.90
Temperature @ pH [°C]	20-Oct-17	14:36	26-Oct-17	15:06	18.7	18.5	16.6	16.9	18.2	19.7	19.7	19.9
Organic Nitrogen [mg/L]	24-Oct-17	06:30	25-Oct-17	13:39	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Phosphorus (total) [mg/L]	24-Oct-17	08:17	25-Oct-17	10:47	---	---	0.90	< 0.03	0.08	---	---	---
Total Kjeldahl Nitrogen [as N mg/L]	20-Oct-17	18:00	24-Oct-17	09:44	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	24-Oct-17	06:30	26-Oct-17	15:06	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ammonia+Ammonium (N) [mg/L]	24-Oct-17	06:30	25-Oct-17	11:16	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	24-Oct-17	11:10	25-Oct-17	13:38	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	24-Oct-17	14:15	26-Oct-17	16:23	< 1	< 1	3	< 1	1	< 1	1	2
Phosphorus (dissolved reactive) [mg/L]	20-Oct-17	18:00	24-Oct-17	15:48	---	---	< 0.03	< 0.03	< 0.03	---	---	---
Chloride [mg/L]	25-Oct-17	09:16	25-Oct-17	16:10	5	5	2	2	12	2	2	93
Sulphate [mg/L]	25-Oct-17	09:50	25-Oct-17	16:10	13	14	14	11	22	10	5	12
Nitrite (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.06	< 0.06	< 0.06	1.14	0.52	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.06	< 0.06	< 0.06	1.14	0.52	< 0.06	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	24-Oct-17	09:00	26-Oct-17	09:16	231	254	206	295	335	254	354	398
Magnesium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	22.3	22.7	17.6	23.3	21.7	22.5	25.2	26.4
Calcium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	55.8	64.2	53.5	79.7	98.3	64.8	100	116
Iron (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	0.047	0.059	0.067	< 0.007	0.287	0.112	0.023	0.431
Phosphorus (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	< 0.003	0.003	0.004	< 0.003	0.029	0.027	0.145	0.064
Sodium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	2.52	1.74	3.15	2.47	12.2	2.28	3.08	54.3

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



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CERTIFICATE OF ANALYSIS Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: Well 5S	6: Well 5I	7: Well 5D	8: Well 9D	9: Well 9I	10: Well 9S
Sample Date & Time					19-Oct-17 14:55	19-Oct-17 15:05	19-Oct-17 15:10	19-Oct-17 10:50	19-Oct-17 11:10	19-Oct-17 11:00
Temperature Upon Receipt [°C]					15.0	15.0	15.0	15.0	15.0	15.0
Alkalinity [mg/L as CaCO3]	20-Oct-17	14:36	26-Oct-17	15:06	348	369	261	218	236	283
Conductivity [uS/cm]	20-Oct-17	14:36	26-Oct-17	15:06	767	870	754	438	452	530
pH [no unit]	20-Oct-17	14:36	26-Oct-17	15:06	7.73	7.72	7.90	7.99	8.15	7.79
Temperature @ pH [°C]	20-Oct-17	14:36	26-Oct-17	15:06	17.0	17.4	18.6	18.2	18.0	16.7
Organic Nitrogen [mg/L]	24-Oct-17	06:30	25-Oct-17	13:39	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Phosphorus (total) [mg/L]	24-Oct-17	08:17	25-Oct-17	10:47	0.45	---	---	---	---	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	20-Oct-17	18:00	24-Oct-17	09:44	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Unionized Ammonia [mg/L as N]	24-Oct-17	06:30	26-Oct-17	15:06	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ammonia+Ammonium (N) [mg/L]	24-Oct-17	06:30	25-Oct-17	11:16	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	24-Oct-17	11:10	25-Oct-17	13:38	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Organic Carbon [mg/L]	24-Oct-17	14:15	26-Oct-17	16:23	2	1	2	< 1	< 1	< 1
Phosphorus (dissolved reactive) [mg/L]	20-Oct-17	18:00	24-Oct-17	15:48	< 0.03	---	---	---	---	< 0.03
Chloride [mg/L]	25-Oct-17	09:16	25-Oct-17	16:10	62	77	75	1	2	4
Sulphate [mg/L]	25-Oct-17	09:50	25-Oct-17	16:10	17	15	24	16	20	6
Nitrite (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.06	< 0.06	0.17	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	24-Oct-17	01:03	30-Oct-17	15:05	< 0.06	< 0.06	0.17	< 0.06	< 0.06	< 0.06
Hardness (dissolved) [mg/L as CaCO3]	24-Oct-17	09:00	26-Oct-17	09:16	291	341	273	233	245	282
Magnesium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	18.7	21.6	19.2	21.3	21.1	21.8
Calcium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	85.5	101	77.8	58.3	63.4	77.1
Iron (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	0.369	0.063	0.012	0.026	< 0.007	0.027
Phosphorus (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	0.015	0.006	0.005	0.005	< 0.003	< 0.003
Sodium (dissolved) [mg/L]	24-Oct-17	09:00	26-Oct-17	09:16	27.4	45.3	47.0	2.77	6.02	1.21

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



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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix C

Sludge Haulage Volumes

2017 - Hauled Sewage

	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Bruce Peninsula Septic Service	2,640	3,870	11,120	36,370	16,820	33,510	36,975	73,680	31,725	10,075	37,050	5,680	299,515
Scott Septic Pumping	0	0	0	8,800	83,500	157,600	224,800	256,200	146,000	54,500	14,000	0	945,400
Mountain Trout Camp	0	0	0	0	2,400	4,800	9,600	13,200	8,400	3,600	0	0	42,000
Total	2,640	3,870	11,120	45,170	102,720	195,910	271,375	343,080	186,125	68,175	51,050	5,680	1,286,915

*amounts in imperial gallons



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Appendix D

Calibration Reports

Western Office Eastern Office
2088 Jetstream Road 1602 Old Wooler Road
London, Ontario Wooler, Ontario
N5V 3P6 K0K 3M0

AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL		EQUIPMENT DETAIL	
CUSTOMER	OCWA - West Highlands	[MUT] MANUFACTURER	Fisher & Porter
CONTACT	Leo Paul Frigault Cluster Manager 519-797-3080	MODEL	50XM1000
		CONVERTER SERIAL NUMBER	9312030479
		FUSE	Pull Plug on Unit
		PLANT ID	Tobermory
		METER ID	Sewage Lift Station
		FIT ID	N/A
		CLIENT TAG	OCWA# 249600
		OTHER	ORG 1132
VER. BY - FM	Paris Machuk	GPS COORDINATES	N45 15.319 W81 39.874
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.		VERIFICATION DATE	May 09, 2017
		CAL. FREQUENCY	Annual
		CAL. DUE DATE	May, 2018

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	150	AS FOUND	1140589	M3
F.S. FLOW - MAG	LPS	169.0	AS LEFT	1140597	M3
F.S. RANGE - O/P	LPS	25.0	DIFFERENCE	8	M3
			TEST CRITERIA		
			AS FOUND CERTIFICATION TEST	Yes	
			FORWARD FLOW DIRECTION	Yes	
			ALLOWABLE [%] ERROR	15	
			COMPONENTS TESTED		
			CONVERTER DISPLAY	Yes	
			mA OUTPUT	Yes	
			TOTALIZER	Yes	
			ACCURACY BASED ON [% o.r.]	Yes	
			ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.		

FLOW TUBE SIMULATION							
		0.00	0.37	0.74	1.11	1.48	% Dial (m/s)
		0.00	3.70	7.40	11.09	14.79	% F.S. Flow
		0.0	25.0	50.0	75.0	100.0	% F.S. Range
REF. FLOW RATE		0.000	6.250	12.500	18.750	25.000	LPS
MUT [Reading]		0.500	7.100	13.300	19.470	25.850	LPS
MUT [Difference]		0.500	0.850	0.800	0.720	0.850	LPS
MUT [% Error]		n/a	13.60	6.40	3.84	3.40	%
mA OUTPUT		4.000	8.000	12.000	16.000	20.000	mA
MUT [Reading]	min. 4.000 mA	4.316	8.528	12.500	16.429	20.527	mA
MUT [Difference]	max. 20.000 mA	0.316	0.528	0.500	0.429	0.527	mA
MUT [% Error]		7.90	6.60	4.17	2.68	2.64	%
TOTALIZER - REF. FLOW RATE						25.000	LPS
TOTALIZER [MUT]						3	M3
TEST TIME						117.35	SECONDS
CALC. TOTALIZER						2.934	M3
ERROR						2.21	%

COMMENTS	QUALITY MANAGEMENT STANDARDS INFO.			RESULTS		
	[QMS] INFORMATION	IDENT.	ID #	TEST	AVG % o.r.	PASS FAIL
	Note: noticeable buzzing noise coming from display unit! Also unit not reading 0 flow at zero as set on simulator. Display is very erratic. Would recommend budgeting for replacement of unit for near future as these units are at end of life cycle.	[REFERENCE] FTS	ABBMM	1	DISPLAY	6.81
PROCESS METER		DMM	3	mA OUTPUT	4.80	PASS
ANALOG METER		AM	N/A	TOTALIZER	2.21	PASS
STOP WATCH		SW	Yes			

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