



March 24, 2021

Ms. Cindy Hood
District Manager, Barrie District Office
Ministry of the Environment, Conservation and Parks
Unit 1201, 54 Cedar Pointe Drive,
Barrie, ON L4N 5R7

Re: 2020 Performance Report for Bayshore Village Sewage Works

Attached is the 2020 Performance Report for the **Bayshore Village Sewage Works** located at 3820 Side Road 20 in the Township of Ramara. This report has been completed in accordance with the Certificate of Approval No. 3-1337-81-968 and issued to The Corporation of the Township of Ramara on July 17, 1996.

This report was prepared by the Ontario Clean Water Agency on behalf of The Corporation of the Township of Ramara based on the information we have in our records. The report covers the period from January 1 to December 31, 2020.

Sincerely,

Christine Craig
Process & Compliance Technician
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Ontario Clean Water Agency
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cc: A. Mattson, Water Inspector, Barrie District, MECP
N. Leroux, Sr. Operations Manager, OCWA
C. Spencer, Regional Hub Manager, OCWA
G. Redden, General Manager, OCWA
W. Henneberry, Safety, Process & Compliance Manager, OCWA
D. Marks, The Corporation of the Township of Ramara

Bayshore Village Sewage Works

Works # 120002264

Annual Wastewater Performance Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2020

Issued: March 24, 2021

Revision: 0

Operating Authority:



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Background:

The Ontario Clean Water Agency (OCWA) operates and maintains the Bayshore Village Sewage Works behalf of the Township of Ramara. During the reporting period, January 1st, 2020-August 31st, 2020 the Township of Ramara was the operating authority. From September 1st, 2020-December 31st, 2020 the Ontario Clean Water Agency was the operating authority.

The facility is a Class 1 Wastewater Treatment Plant.

The facility's average daily flow is 399m³/day. The average day raw flow for the year 2020 was 401 m³/day.

The Bayshore Village Sewage Works complies with all requirements of the regulating authorities and operates under:

- Certificate of Approval (C of A) No. 3-1337-81-968 issued July 17, 1996

Certificate of Approval (C of A) No. 3-1337-81-968 issued July 17, 1996 Section 4(2) requires the Performance Report to contain the following:

- a) A summary of all monitoring data, including an overview of the success and adequacy of the sewage treatment program;*
- b) a tabulation of all monitoring and analytical results obtained during the reporting period, including sampling/monitoring location and date;*
- c) a record of the operation of the spray irrigation system, including dates and hours of operation, irrigation system, including dates and hours of operations, irrigation areas utilized, rates of effluent application, and volumes of effluent applied;*
- d) an account of any environmental and operating problems encountered at the site and the mitigative measures taken during the reporting period.*

Bayshore Sewage Works consists of two irrigation spray field where the effluent from the lagoons is sprayed at a maximum rate of 55 m³/ha/day from May 18 to September 28 for each calendar year. The timeframe of the spray irrigation may be extended each year upon written request until October 28th.

This report will show that the Ontario Clean Water Agency and the Township of Ramara has made every attempt to achieve its goals through its operational performance. This performance was enhanced through the use of an electronic process data collection database, an electronic maintenance and work order database, an electronic operational excellence database, a training program focused on providing the right skills to staff - also captured and tracked by the use of an electronic database and a multi-skilled, flexible workforce.

This report will show that the requirements of the facility C of A including effluent monitoring and reporting requirements were consistently met and that effluent quality was consistently within C of A requirements.

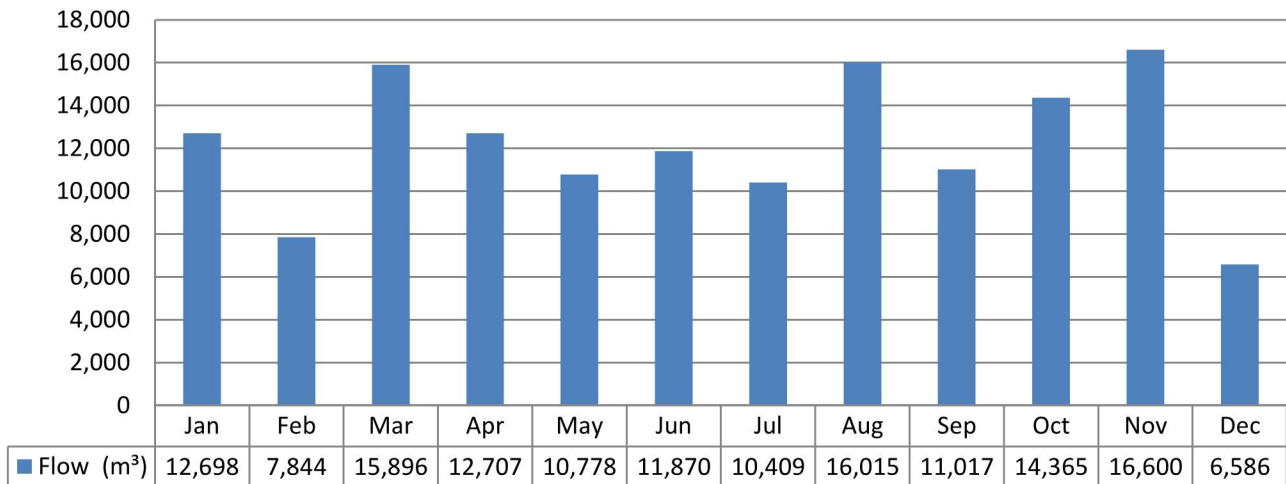
Summary of Influent Flow Data

Condition 1.1 of the (C of A) No. 3-1337-81-968 indicates *“The Owner Shall ensure that the flow of sewage into the sewage treatment plant does not exceed the average daily flow of 399 m³/day for any part of time greater than one (1) calendar year.”* The annual average daily influent flow was 401 m³/day or 100.5 % of the rated capacity in 2020.

The total Influent flow in 2020 was 146 785 m³

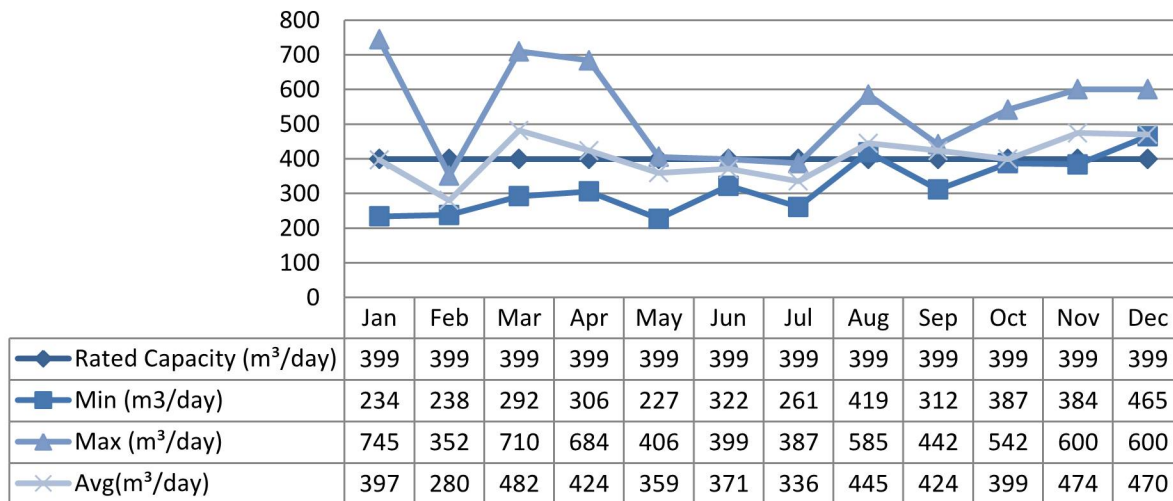
The extended spray season was requested due to a several factors in 2020. The spray season for Bayshore Village Sewage Works started later than usual due to corrective maintenance being completed. A large portion of the spray irrigation piping was replaced in 2020, delaying the start of the spray irrigation season. The piping was replaced during the second week of June. Spray irrigation was utilized as soon as the piping was installed. During the month of August, the weather conditions were consistently poor for spray irrigation to be carried out. Due to both factors mentioned above, a request was put in to extend the spray season to bring down the level in the lagoons to accommodate the flows expected in the winter months.

Graph 1: 2020 Influent Flow Monthly Totals



Note: The above flows are calculated based upon manual flow meter readings and averaged.

Graph 2: Influent Daily Minimum, Maximum and Average Flows



Note: Seasonally a significant fluctuation in flow trends shows higher sewage flows which indicates there is ongoing infiltration into the sewer systems. The Township has a program in place to inspect sump pump connections. In the past, this program has led to several discoveries of illegal connections as well as deficiencies in service laterals. This inspection program will continue in 2021 to ensure sump pumps are not connected to the sanitary sewers. The Ontario Clean Water Agency has maintenance schedules/programs to inspect service laterals, new connections and manholes.

Effluent Spray Irrigation

Effluent spray irrigation was carried out between June 25 and November 19, 2020. Each day while utilizing the spray irrigation system log were kept for: weather conditions, which field was being utilized and the volume of effluent that was applied each day. During the spray irrigation season approximately 26 ha from the North and South fields were utilized over 55 days. A total effluent volume of 93,460 m³ was applied to the spray fields. The average application rate for the reporting period was 64.2 m³/ha/day, which exceeds the Certificate of Approval limit of 55 m³/ha/day, having a later start to the spray irrigation season would have an impact on the average application rate for 2020.

The operation of the spray irrigation system consists of the following seasonally:

- Seasonal spray irrigation piping and spray nozzles are installed and pressure tested prior to the beginning of the spray season.
- The spray irrigation fields are inspected daily along with weather conditions (i.e. no rain and wind velocity less than 15 km/hr) to determine if conditions are favourable for spray irrigation.
- If spray irrigation is favourable, the operator starts the effluent pump. The operator verifies the sprinkler heads are operational. If issues arise such as broken pipes, clogged sprinkler heads, surface ponding and aerosol drift, then the spray operation is modified, discontinued or repaired as required.
- Operations staff maintains daily logs during the spray irrigation operation.

Summary of Sampling Frequency

(C of A) No. 3-1337-81-968 Condition 2.1 (b) describes the requirement for sample collection at the following locations, frequencies and by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 1: Minimum Raw Sewage Sampling Requirements

Influent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Table 2: Minimum Lagoon Effluent Sampling Requirements

Influent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	Annually
Total Suspended Solids	Grab	Annually
Total Phosphorus	Grab	Annually
Total Kjeldahl Nitrogen	Grab	Annually
(Ammonia + Ammonium) Nitrogen	Grab	Annually

Note: The annual sampling of the lagoons effluent shall take place at the beginning of each spray irrigation season.

Table 3: Minimum Surface Water Parameter Sampling Requirements

Final Effluent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	3 per season

Total Suspended Solids	Grab	3 per season
Total Phosphorus	Grab	3 per season
Total Kjeldahl Nitrogen	Grab	3 per season
(Ammonia + Ammonium) Nitrogen	Grab	3 per season
Nitrates	Grab	3 per season
Nitrites	Grab	3 per season
pH	Grab	3 per season
Temperature	Grab	3 per season

Note: The surface water sampling shall take place prior to, in the middle, and after each spray irrigation season, provided that there is flow in the stream.

Table 4: Minimum Soil Parameter Sampling Requirements

Final Effluent Sampling Point		
Parameters	Sample Type	Frequency
Total Organic Carbon	Core	Annually
Total Phosphorus	Core	Annually
Total Kjeldahl Nitrogen	Core	Annually
(Ammonia + Ammonium) Nitrogen	Core	Annually
Nitrite and Nitrate Nitrogen	Core	Annually
Chlorides	Core	Annually
Sodium	Core	Annually
Conductivity	Core	Annually
pH	Core	Annually

Note: The annual soil sampling shall take place prior to each sprat irrigation season.

Sewage and Effluent Quality

Raw Sewage Characteristics

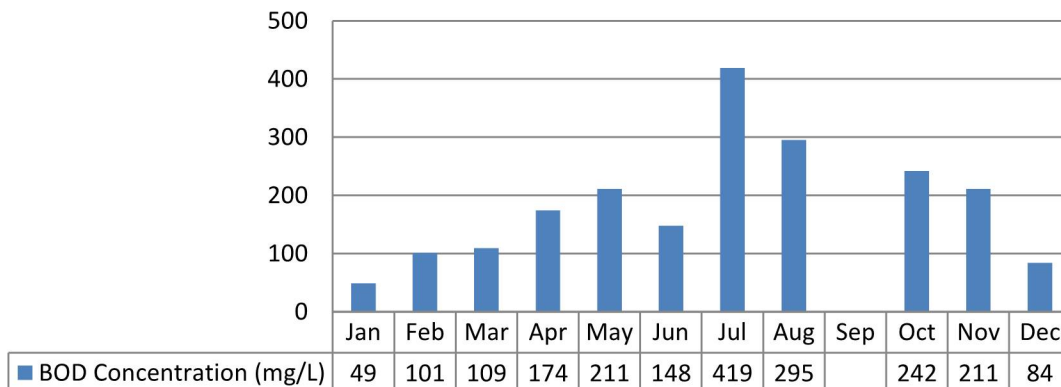
Detailed below are raw sewage characteristics for the 2020 reporting period. The results have remained comparable with the previous year.

During the reporting period there was one missed sample for the raw sewage in September of 2020, as required by (C of A) No. 3-1337-81-968 Condition 2.1 (b).

Biochemical Oxygen Demand (BOD5)

BOD5 Monthly Average Concentration

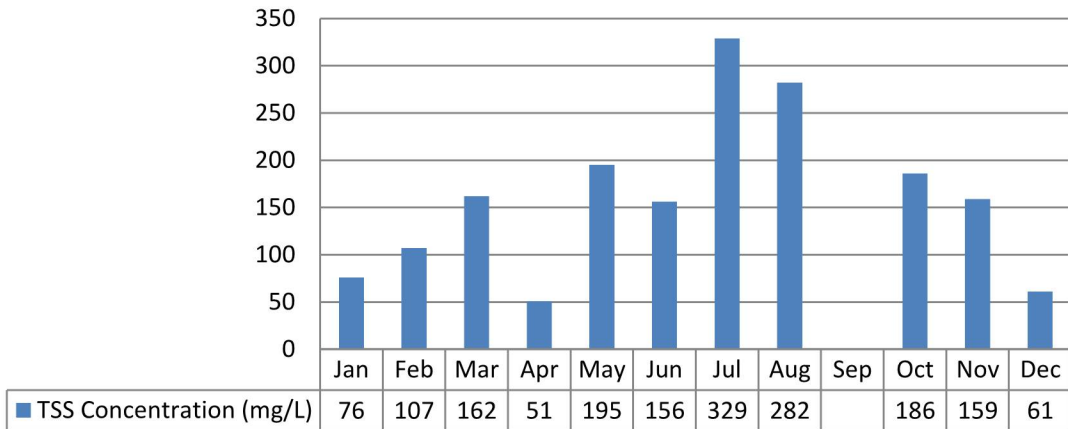
Graph 3: 2020 Monthly BOD5 Raw Sewage Concentration



Total Suspended Solids (TSS)

Total Suspended Solids Monthly Average Concentration

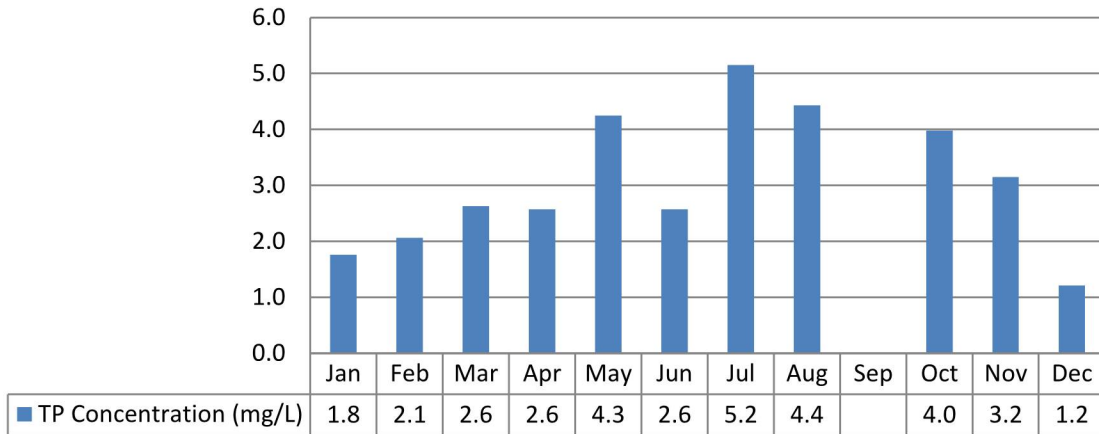
Graph 4: 2020 Monthly TSS Raw Sewage Concentration



Total Phosphorus (TP)

Total Phosphorus Monthly Average Concentration

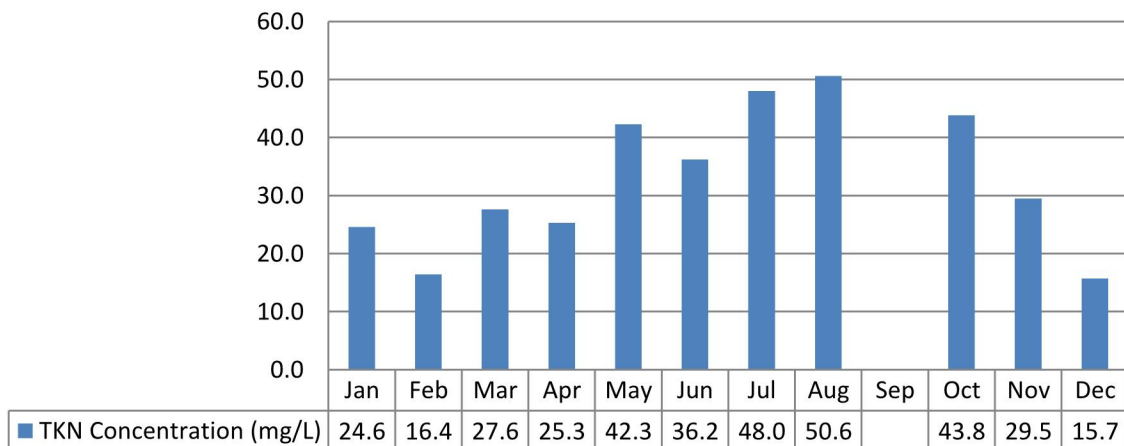
Graph 5: 2020 Monthly Total Phosphorus Raw Sewage Concentration



Total Kjeldahl Nitrogen TKN (mg/L)

Total Kjeldahl Nitrogen (TKN) Monthly Raw Average Concentration

Graph 6: 2020 Monthly Total Kjeldahl Nitrogen (TKN) Monthly Raw Sewage Concentration Comparison



Effluent Quality

Grab samples were collected from each lagoon prior to the start of the spray irrigation season on May 05, 2020. Another set of grab samples were collected at the end of the spray irrigation season on November 26, 2020. The samples were collected as per the Certificate of Approval No. 3-1337-81-968 Condition 2.1 (b). The laboratory results are summarized in Table 5.

There are no effluent limits or objectives in the Certificate of Approval.

A summary of the Final Effluent and Raw Sewage monitoring data is contained in Appendix I of this report.

Table 5: Lagoon Content Characteristics

Parameter	Large Lagoon (Cell A)		Small Lagoon (Cell B)	
	May	November	May	November
BOD₅ (mg/L)	13	26	10	28
Total Suspended Solids (mg/L)	66	20	39	32
Total Phosphorus (mg/L)	0.56	0.77	1.43	0.74
TKN (mg/L)	3.4	5.7	20.0	6.0
TAN (mg/L)	0.3	1.5	16.2	1.5

Effluent Spray Irrigation

Groundwater Monitoring

Groundwater samples were collected in May, August and November for groundwater monitoring in six boreholes in and around the North and South spray irrigation fields. The results for the ground water monitoring samples are summarized below in Tables 6-11. The results were compared with the Ontario Drinking Water Standards, Objectives and Guidelines (ODWS). Chloride concentrations ranged from 4 mg/L to 140 mg/L, which is similar to levels measured in 2019. Nitrate levels were low, comparable to samples collected in 2019. Most other parameters measured (nitrogen, TKN and TAN) were undetectable. The results received indicate the low impact the spray irrigation fields are having on the groundwater.

Table 6: Groundwater Monitoring - 1-1 (East South Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-1 (East South Field)	3	2	2
Nitrite (mg/L)	1-1 (East South Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-1 (East South Field)	<0.06	<0.06	<0.06
Chloride (mg/L)	1-1 (East South Field)	130	140	140
TKN (mg/L)	1-1 (East South Field)	<0.5	<0.5	<0.5
TAN (mg/L)	1-1 (East South Field)	<0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-1 (East South Field)	0.07	0.04	<0.03

Table 7: Groundwater Monitoring - 1-3 (South Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-3 (South Field)	2	8	4
Nitrite (mg/L)	1-3 (South Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-3 (South Field)	<0.06	0.26	0.14
Chloride (mg/L)	1-3 (South Field)	100	92	120
TKN (mg/L)	1-3 (South Field)	<0.5	<0.5	<0.5
TAN (mg/L)	1-3 (South Field)	0.2	<0.1	<0.1
Total Phosphorus (mg/L)	1-3 (South Field)	0.29	0.17	0.13

Table 8: Groundwater Monitoring - 1-4 (North Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-4 (North Field)	2	4	1
Nitrite (mg/L)	1-4 (North Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-4 (North Field)	<0.06	0.11	<0.06
Chloride (mg/L)	1-4 (North Field)	5	5	7
TKN (mg/L)	1-4 (North Field)	<0.5	<0.5	<0.5
TAN (mg/L)	1-4 (North Field)	<0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-4 (North Field)	<0.03	0.05	<0.03

Table 9: Groundwater Monitoring - 1-5 (North Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-5 (North Field)	2	3	2
Nitrite (mg/L)	1-5 (North Field)	<0.03	0.32	<0.03
Nitrate (mg/L)	1-5 (North Field)	<0.06	2.06	<0.06
Chloride (mg/L)	1-5 (North Field)	8	8	4
TKN (mg/L)	1-5 (North Field)	<0.05	1.4	<0.5
TAN (mg/L)	1-5 (North Field)	<0.1	1.1	<0.1
Total Phosphorus (mg/L)	1-5 (North Field)	<0.03	0.30	0.03

Table 10: Groundwater Monitoring - 1-7 (North Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-7 (North Field)	5	6	8
Nitrite (mg/L)	1-7 (North Field)	<0.03	0.04	0.11
Nitrate (mg/L)	1-7 (North Field)	<0.06	<0.06	0.15
Chloride (mg/L)	1-7 (North Field)	63	75	76
TKN (mg/L)	1-7 (North Field)	2.9	4.1	3.4
TAN (mg/L)	1-7 (North Field)	2.2	4.2	2.8
Total Phosphorus (mg/L)	1-7 (North Field)	0.47	0.80	0.40

Table 11: Groundwater Monitoring - 1-1 (West North Field)

Parameter	Location	May	August	November
Diss. Organic Carbon (mg/L)	1-1 (West North Field)	3	2	2
Nitrite (mg/L)	1-1 (West North Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-1 (West North Field)	0.63	0.09	<0.06
Chloride (mg/L)	1-1 (West North Field)	85	70	67
TKN (mg/L)	1-1 (West North Field)	<0.5	<0.5	<0.5

TAN (mg/L)	1-1 (West North Field)	<0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-1 (West North Field)	0.04	0.04	0.04

Surface Water Monitoring

The surface water monitoring takes place at Wainman Creek, upstream and downstream of the spray fields. Samples were taken in May, August and November of 2020. All samples were taken as per (C of A) No. 3-1337-81-968 Condition 2.1 (b).

The sample results from Wainman's Creek are shown in Tables 12 and 13. The upstream and downstream sample location results show water quality is consistent, signifying little to no impact from the spray irrigation process.

Table 12: Surface Water Monitoring- Wainman's Creek (Upstream)

Parameter	Location	May	August	November
BOD5 (mg/L)	Wainman's Creek (Upstream)	<4	<4	<4
Total Suspended Solids (mg/L)	Wainman's Creek (Upstream)	7	3	10
pH	Wainman's Creek (Upstream)	7.84	7.82	8.05
Total Kjeldahl Nitrogen (as N mg/L)	Wainman's Creek (Upstream)	0.9	0.8	<0.5
Ammonia+Ammonium (N) (as N mg/L)	Wainman's Creek (Upstream)	<0.1	<0.1	<0.1
Nitrite (mg/L)	Wainman's Creek (Upstream)	<0.03	<0.03	<0.3
Nitrate (mg/L)	Wainman's Creek (Upstream)	0.44	<0.06	1.16
Nitrite + Nitrate (mg/L)	Wainman's Creek (Upstream)	0.44	<0.06	1.16
Phosphorus (total) (mg/L)	Wainman's Creek (Upstream)	0.031	0.037	<0.03
E.coli (cfu/100mL)	Wainman's Creek (Upstream)	60		
Total Coliforms (cfu/100mL)	Wainman's Creek (Upstream)	940		

Table 13: Surface Water Monitoring- Wainman's Creek (Downstream)

Parameter	Location	May	August	November
BOD5 (mg/L)	Wainman's Creek (Downstream)	<4	<4	<4
Total Suspended Solids (mg/L)	Wainman's Creek (Downstream)	7	2	7
pH	Wainman's Creek (Downstream)	7.79	7.78	8.02
Total Kjeldahl Nitrogen (as N mg/L)	Wainman's Creek (Downstream)	0.9	0.5	0.5

Ammonia+Ammonium (N) (as N mg/L)	Wainman's Creek (Downstream)	<0.1	<0.1	<0.1
Nitrite (mg/L)	Wainman's Creek (Downstream)	<0.03	0.06	<0.03
Nitrate (mg/L)	Wainman's Creek (Downstream)	0.40	0.06	1.16
Nitrite + Nitrate (mg/L)	Wainman's Creek (Downstream)	0.40	0.06	1.16
Phosphorus (total) (mg/L)	Wainman's Creek (Downstream)	0.032	0.035	<0.03
E.coli (cfu/100mL)	Wainman's Creek (Downstream)	80		
Total Coliforms (cfu/100mL)	Wainman's Creek (Downstream)	700		

Soil Core Monitoring

The soil core monitoring samples are taken in the North and South spray fields. All samples were taken as per (C of A) No. 3-1337-81-968 Condition 2.1 (b) during the 2020 reporting period.

Table 14: Soil Core Monitoring- North Field Upper

Parameter	Location	May
pH	North Field Upper	6.21
Conductivity ($\mu\text{S}/\text{cm}$)	North Field Upper	62
Chloride ($\mu\text{g}/\text{g}$)	North Field Upper	12
Nitrate + Nitrite as N ($\mu\text{g}/\text{g}$)	North Field Upper	<0.2
TKN ($\mu\text{g}/\text{g}$)	North Field Upper	0.07
TAN ($\mu\text{g}/\text{g}$)	North Field Upper	<0.01
Total Organic Carbon ($\mu\text{g}/\text{g}$)	North Field Upper	1.8
Phosphorus ($\mu\text{g}/\text{g}$)	North Field Upper	330
Sodium ($\mu\text{g}/\text{g}$)	North Field Upper	350

Table 15: Groundwater Monitoring - North Field Lower

Parameter	Location	May
pH	North Field Lower	6.08
Conductivity ($\mu\text{S}/\text{cm}$)	North Field Lower	25
Chloride ($\mu\text{g}/\text{g}$)	North Field Lower	2.3
Nitrate + Nitrite as N ($\mu\text{g}/\text{g}$)	North Field Lower	<0.2
TKN ($\mu\text{g}/\text{g}$)	North Field Lower	0.10
TAN ($\mu\text{g}/\text{g}$)	North Field Lower	<0.01
Total Organic Carbon ($\mu\text{g}/\text{g}$)	North Field Lower	1.7
Phosphorus ($\mu\text{g}/\text{g}$)	North Field Lower	270
Sodium ($\mu\text{g}/\text{g}$)	North Field Lower	220

Table 16: Groundwater Monitoring - South Field

Parameter	Location	May
pH	South Field	7.21
Conductivity (µS/cm)	South Field	110
Chloride (µg/g)	South Field	5.3
Nitrate + Nitrite as N (µg/g)	South Field	<0.2
TKN (µg/g)	South Field	0.17
TAN (µg/g)	South Field	<0.01
Total Organic Carbon (µg/g)	South Field	3.4
Phosphorus (µg/g)	South Field	510
Sodium (µg/g)	South Field	140

Description of Operating Problems

The following details describe all operating problems encountered during the reporting period and the corrective actions taken:

Table 17: Bayshore Village Sewage Works Operational Challenges

Month	Challenges	Corrective Actions
May- November	Weather was not ideal during spray irrigation season, ongoing challenge	Monitor weather, utilize good weather conditions days. Request longer spray irrigation season.
June	The spray irrigation season couldn't start until the spray irrigation piping was replaced, installation was delayed.	New piping installed, started spray irrigation as soon as piping was installed
	Influent pipe failed	Installed a new foot valve.

Summary of Maintenance

Routine maintenance and operation of the Bayshore Village Sewage Works and Sewage Pumping Stations in 2020 consisted of the following:

- Attended to Hydro failures
- Collected samples as per the C of A
- Install seasonal piping
- Exercised generator
- Monitor levels in lagoons
- Monitor weather conditions
- Performed routine maintenance and repair of pumps

Summary of Effluent Quality Assurance or Control Measures Undertaken

All final effluent samples collected during the reporting period to meet C of A sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis. SGS Lakefield Research has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial

guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis.

Effluent quality assurance is maintained in several ways. Laboratory samples are sent to an accredited laboratory (SGS Canada Inc. - Lakefield) for analysis of all effluent parameters. Sampling calendars issued to the operator which denote frequency of sampling. Calendars are used as a tracking mechanism throughout the month to ensure all required samples are collected. These calendars are submitted to the Process Compliance Technician at the end of each month for review. Raw and effluent samples are collected as per the Amended C of A and the results are reviewed on a regular basis to ensure compliance.

Work orders illustrating all scheduled and preventative maintenance to be completed are issued to the operator and/or mechanic. OCWA conducts internal audits of the facility and develops Action Plans to ensure deficiencies are identified.

Summary of Calibration and Maintenance

Calibrations on effluent monitoring equipment were performed by Flowmetrix Technical Services Inc. on June 08, 2020 for equipment located at the Bayshore Village Sewage Works. Please see Appendix II: Calibration Report.

Table 18: Calibration and Maintenance Dates on the Influent/Effluent Monitoring Equipment

Table 18: Bayshore Village Sewage Works – Summary of Raw and Final Effluent Monitoring Equipment – 2020	
Influent Monitoring Equipment	Date of Completion
Influent Flow Meter	June 08, 2020
Final Effluent Monitoring Equipment	Date of completion
Final Effluent Spray Fields Flow Meter	June 08, 2020

Sludge Accumulation

Sludge measurements were taken in 2013 showing there is an estimated volume of 2,370 m³ in the Small Lagoon and sludge measurements were taken in 2014 showing there is an estimated volume of 4,980 m³ in the Large Lagoon. The current sludge accumulation does not warrant removal at this time.

Community Complaints

During the 2020 reporting period there was no community complaints received.

Summary of Bypass, Spills or Abnormal Discharge Events

There were not any spills, by-passes or abnormal discharge events during 2020.

Appendix I

Performance Assessment Report

Ontario Clean Water Agency

Facility: [1616] Bayshore Village Sewage Works

Works: [120002264]

From: January 1, 2020-December 31, 2020

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	<--Total-->	<--Avg.-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Raw (m³)	12698.00	7844.00	15896.00	12707.00	10778.00	11870.00	10409	16015	11017	14365	16600	6586	146785			
Raw Flow: Avg - Raw (m³/d)	396.81	280.14	481.69	423.57	359.27	370.93	335.7	444.8	423.7	399.02	474.28	407.43		399.78		
Raw Flow: Max - Raw (m³/d)	744.60	351.60	710.00	684.00	405.75	398.60	387	585.1	441.7	542	600	600			744.60	
Eff. Flow: Total - Eff (m³)	0.00	0.00	0.00	0.00	0.00	12406.00	33061	14500	23291	6587	3615	0.00	93460			
Eff. Flow: Avg - Eff (m³/d)	0.00	0.00	0.00	0.00	0.00	2481.20	1944.76	1812.5	1455.69	1097.83	903.75	0.00		807.98		
Eff. Flow: Max - Eff (m³/d)	0.00	0.00	0.00	0.00	0.00	2992.00	2523	2266	2984	1459	1316	0.00			2992.00	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Eff: Avg BOD5 - Eff (mg/L)					11.50			29			27			22.50	29.00	
Eff: # of samples of BOD5 - Eff (mg/L)					2			1			2		5			
Loading: BOD5 - Eff (kg/d)					0.00			52.55			24.40			25.65	52.55	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw (mg/L)	49.00	101.00	109.00	174.00	211.00	148.00	419	295		242	211	84		185.73	419.00	
Raw: # of samples of BOD5 - Raw (mg/L)	1	1	1	1	1	1	1	1		1	1	1	11			
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw (mg/L)	76.00	107.00	162.00	51.00	195.00	156.00	329	282		186	159	61		160.36	329.00	
Raw: # of samples of TSS - Raw (mg/L)	1	1	1	1	1	1	1	1		1	1	1	11			
Eff: Avg TSS - Eff (mg/L)					52.50			20			26			32.83	52.50	
Eff: # of samples of TSS - Eff (mg/L)					2			1			2		5			
Loading: TSS - Eff (kg/d)					0.00			36.25			23.4975			19.92	36.25	
Total Phosphorus: TP:																
Raw: Avg TP - Raw (mg/L)	1.76	2.06	2.63	2.57	4.25	2.57	5.15	4.43		3.98	3.15	1.21		3.07	5.15	
Raw: # of samples of TP - Raw (mg/L)	1	1	1	1	1	1	1	1		1	1	1	11			
Eff: Avg TP - Eff (mg/L)					1.00			0.06			0.755			0.60	1.00	
Eff: # of samples of TP - Eff (mg/L)					2			1			2		5			
Loading: TP - Eff (kg/d)					0.00			0.108			0.682			0.26	0.68	
Nitrogen Series:																
Raw: Avg TKN - Raw (mg/L)	24.60	16.40	27.60	25.30	42.30	36.20	48	50.6		43.8	29.5	15.7		32.73	50.60	
Raw: # of samples of TKN - Raw (mg/L)	1	1	1	1	1	1	1	1		1	1	1	11			
Eff: Avg TAN - Eff (mg/L)					8.25			0.01			1.5			3.25	8.25	
Eff: # of samples of TAN - Eff (mg/L)					2.00			1			2		5			
Loading: TAN - Eff (kg/d)					0.00			0.018			1.356			0.46	1.36	

Appendix II

Calibration Reports

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL		EQUIPMENT DETAIL	
CUSTOMER	Township of Ramara	[MUT] MANUFACTURER	ABB
CONTACT	Dave Readman Manager of Environmental Services PO Box 130 Brechin, ON P: 705-484-5374 x287 E: dreadman@ramara.ca	MODEL	WaterMaster
		SERIAL NUMBER	3K220000157278
		PLANT ID	Bayshore East Station
		METER ID	East Pump
		FIT ID	NA
		CLIENT TAG	NA
		OTHER	NA
		GPS COORDINATES	N 44.558 W 79.276
VER. BY - FM	Michael Jorin	VERIFICATION DATE	June 8th 2020
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		CAL. FREQUENCY	Annual
		CAL. DUE DATE	June 2021

SENSOR INFORMATION				VERIFICATION HISTORY			
Q3	l/s	175		OIML Accuracy Alarms		0	
CALIBRATION ACCURACY		OIML Class 2		TOTALIZER INFORMATION			
SENSOR CAL. ACCURACY	%	136.2		FORWARD	765960.41	m3	
	mm/sec	0		REVERSE	7411.77	m3	
	~	11		NET	758548.64	m3	
DATE OF MANUFACTURE		08 Feb 2014		SENSOR DATA			
RUN HOURS	d/h/m	1711/6/45		COIL CURRENT	179.9	mA	
TRANSMITTER INFORMATION				COIL INDUCTANCE	157.8	mH	
APPLICATION VERSION		v01.06.00	12/07/12	COIL SHIFT	-0.1	%	
MSP VERSION		01.00.00		COIL/LOOP RESISTANCE	35.3	ohm	
DATE OF MANUFACTURE		08 Feb 2014		TRANSMITTER DATA			
RUN HOURS	d/h/m	2176/22/4		TX GAIN - ADJUSTMENT	0.1	%	
ALLOWABLE TOLERANCE	%	15.0		VeriMASTER INFORMATION			
CURRENT OUTPUT				VERSION	01.00.01		
OUTPUT TEST	4.00	READING	ERROR	FAIL	LIMIT VERSION	01.00.01	
	20.00	mA	%		CONFIGURATION SETTINGS		
4.0 mA	4.00	3.999	-0.02	PASS	MAINS/FREQUENCY	60	Hz
12.0 mA	12.00	12.003	0.03	PASS	QMAX	166.7	l/s
20.0 mA	20.00	20.001	0.01	PASS	PULSES/UNIT	30	
PULSE OUTPUT				PULSES LIMIT FREQUENCY	1200	Hz	
OUTPUT TEST		READING	ERROR	FAIL	SENSOR USER	SPAN	100
		mA	%			ZERO	0
OUTPUT 1, Hz	100	N/A	N/A	N/A	USER FLOW	CUTOFF	1
OUTPUT 1, Hz	50	N/A	N/A	N/A		HYSTERESIS	20
OUTPUT 2, Hz	100	N/A	N/A	N/A	METER MODE		Normal Operation
OUTPUT 2, Hz	50	N/A	N/A	N/A			

COMMENTS		QUALITY MANAGEMENT STANDARDS INFO.	
		[QMS] INFORMATION	IDENT. ID #
		[REFERENCE] FTS	ABBWM 1
		PROCESS METER	PM 1

The information contained within this report was produced by "VeriMASTER - Flow Meter Verification Report". The AS LEFT information is the same as the AS FOUND information within this report. If changes have been made relative to the accuracy of the calibration, an AS LEFT certificate will be issued.

Greyline Doppler Flowmeter

Verification/ Calibration Report



Customer: Township of Ramara
 Contact: Dave Readman
 Manager of Environmental Services
 PO Box 130
 Brechin, ON
 P: 705-484-5374 x287
 E: dreadman@ramara.ca

Western Office
 2088 Jetstream Road
 London, Ontario
 N5V 3P6

Eastern Office
 1602 Old Wooler Road
 Wooler, Ontario
 K0K 3M0

Test Performed By: Michael Jorin

Plant ID	Bayshore Village	Date of Verification	08-Jun-20
Meter ID	Bayshore Spray Fields	Calibration Frequency	Annual
FIT ID	NA	Date of Next Verification	June-21
Client Tag	NA		
GPS Coordinates	N 44°34.420 W 079°16.389		

AS FOUND CERTIFICATION

Chart Recorder/Data Recorder Details

Manufacturer	Greyline	Comparative Readings Check	[Y/N]	y							
Model	DFM-IV	Display Readings Check	[Y/N]	y							
Converter S/N:	23437	Chart Readings Check	[Y/N]	y							
Channel Number used [Y or N]	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>n</td> <td>n</td> <td>n</td> </tr> </table>	1	2	3	4	y	n	n	n		
1	2	3	4								
y	n	n	n								

CHANNEL INFORMATION	CHANNEL 1			
Meter Input	Raw Flow			
Engineering Parameter	M3/Day			
Display Max. Range	19240.00			
Chart Max. Range	19240.00			

COMPARATIVE READINGS	CHANNEL 1			
Meter Input Reading	n/a			
Chart/ Recorder Display Reading	n/a			
Difference Reading	#VALUE!			
PASS/FAIL	#VALUE!			

DISPLAY READINGS		CHANNEL 1											
Test No.	% Max. Range	Calc.	Actual	% Error	Calc.	Actual	% Error	Calc.	Actual	% Error	Calc.	Actual	% Error
1	0%	0	0	n/a									
2	25%	4810.00	4810.00	0.00									
3	50%	9620.00	9620.00	0.00									
4	75%	14430.00	14430.00	0.00									
5	100%	19240.00	19240.00	0.00									
	Average % Error			0.00									
	PASS/FAIL			PASS									

mA OUTPUT READINGS		CHANNEL 1											
Test No.	% Max. Range	Calc.	Actual	% Error	Calc.	Actual	% Error	Calc.	Actual	% Error	Calc.	Actual	% Error
1	0%	4.000	4.000	n/a									
2	25%	8.000	8.000	0.00									
3	50%	12.000	12.002	0.02									
4	75%	16.000	16.003	0.02									
5	100%	20.000	20.005	0.02									
	Average % Error			0.02									
	PASS/FAIL			PASS									

This verification sheet either identifies exact 0 - 100% signal input comparison or a comparative review between a calibrated field instrument [i.e. flow meter] readings and the chart recorder/data recorder readings.