



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Bayfield Sewage Treatment Plant
2020
Annual
Compliance Report

Municipality of Bluewater
WW#120002754

Overview of the System

The Bayfield Sewage Treatment Plant is operated per Amended Environmental Compliance Approval (ECA) # 6250-AB4JCT issued August 26, 2016.

The Bayfield Sewage Treatment Plant is a Class 1 Wastewater Treatment facility.

The sewage treatment facility is located on a site approximately 750 m North of Huron County Rd #3 and approximately 2.5 km east of the east boundary of the Village of Bayfield and consists of the following:

Inlet Works

- Inlet raw sewage force main in an easement from Huron County Road #3 to the Control Building and Inlet Chamber including in-ground air relief valve chambers;
- A Control Building housing an inlet raw sewage flow meter with by-pass valves and piping;
- An Inlet Chamber with separate inlet piping to either sewage lagoon Cell 1 and/or lagoon Cell 2;

Waste Stabilization Lagoon

- Two Sewage Cells 1 and 2, each having top dimensions of 424.4 m x 154.4 m, a design liquid depth of 1.8 m and each having an effective storage volume of approximately 110,554 m³ with the cells operating in series;
- A Transfer Chamber to interconnect sewage lagoon Cell 1 and lagoon Cell 2;
- Gravity discharge pipe from each cell to the Filter Pumping Station Inlet Chamber;

Intermittent Sand Filters

- A Filter Pumping Station Inlet Chamber including valves and piping to allow discharge by gravity to the Filter Pumping Station or the Discharge Chamber;
- An in-ground Filter Pumping Station consisting of two submersible sewage pumps, having a total rated capacity with parallel operation of 215.0 L/s at a TDH of 9.8 m, valves and piping, liquid level indicators and alarm, etc. with force main discharge piping to a filter Distribution Chamber;
- A Filter Distribution Chamber with valves to permit the Filter Pumping Station to discharge to either or both of the Intermittent Sand Filters;
- Two Intermittent Sand Filters each with a top surface area of approximately 71 m x 37 m and a minimum effective filtering area of 2,312 m², together with a distribution piping and under drain collection piping, designed for an average hydraulic loading rate of 1,708 m³/d, discharging by gravity to a Discharge Chamber;

Phosphorus Removal System

- A liquid alum feed system for phosphorous removal located in the Control Building, consisting of one 27,000 L chemical storage tank and three metering pumps (two duty, one standby) all within a containment enclosure, with dual point injection into the inlet raw sewage force main and Cell 1 – Cell 2 Transfer Chamber;

Effluent Discharge and Outfall

- A Discharge Chamber and Sampling Building housing flow measurement devices including weir level transducer baffle and effluent sample piping;
- Outfall structure and piping to Bayfield River;

Imported Sewage

- Leachate is to be received at the influent chamber for co-treatment at the works, leachate is imported from the Stanley Landfill site located at 38594 Mill Road in the Municipality of Bluewater, at a rate not exceeding 200 m³/ d or an annual total of 2,000 m³/year;

Miscellaneous

All other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the Works.

The following provides a summary of the reporting requirements of the current Environmental Compliance Approval:

- (a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Effluent Limits Condition, including an overview of the success and adequacy of the Works;**

Effluent Limits		2020 Annual Average Concentration	2020 Maximum Monthly Concentration
Effluent Parameter	Monthly Average Concentration		
CBOD5	10.0 mg/L	< 2.19 mg/L	< 3.0 mg/L
Total Suspended Solids	10.0 mg/L	< 2.19 mg/L	< 3.0 mg/L
Total Phosphorus	0.5 mg/L	0.23 mg/L	0.30 mg/L
Total Ammonia Nitrogen	4.0 mg/L	< 0.22 mg/L	< 0.73 mg/L
E. Coli	200 organisms per 100 mL Monthly Geometric Mean Density	5.68 (organisms per 100ml)	20.61 (organisms per 100ml)
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		7.10	Min. - Max. 6.46 – 7.90

Effluent Limits		
Effluent Parameter	Annual Total Loading	2020 Seasonal Average Loading
CBOD5	15.1 kg/d	< 3.22 kg/d
Total Suspended Solids	15.1 kg/d	< 3.22 kg/d
Total Phosphorus	0.76 kg/d	0.34 kg/d

The 2020 average daily flow of raw sewage was 993.45 m³/day; this is 92.67 % of the rated capacity of 1,072 m³/day. The maximum daily raw sewage flow for 2020 was 2,934 m³/day; this is 273.7 % of the rated capacity. The maximum daily raw sewage flow occurred in January of 2020; see charts 1a and 1b.

Chart 1a: Bayfield Lagoons Average Daily Raw Sewage flows in 2020 compared to 2019 flows.

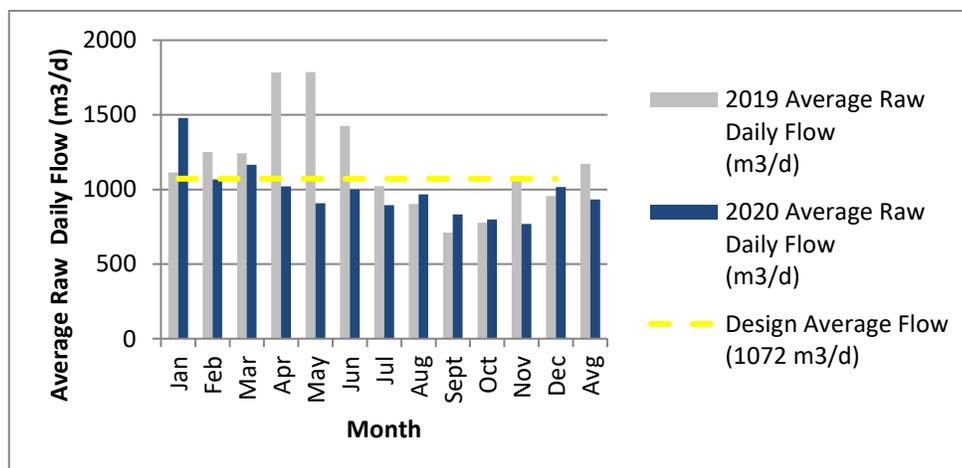
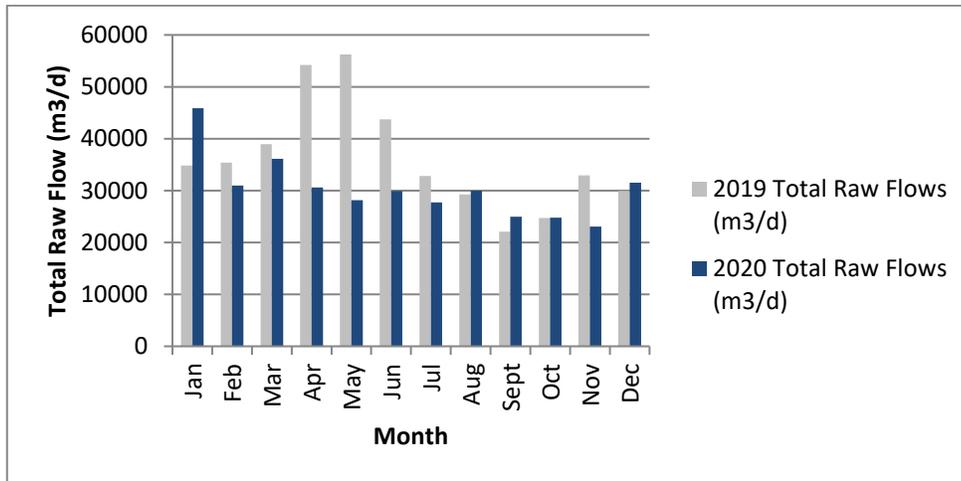
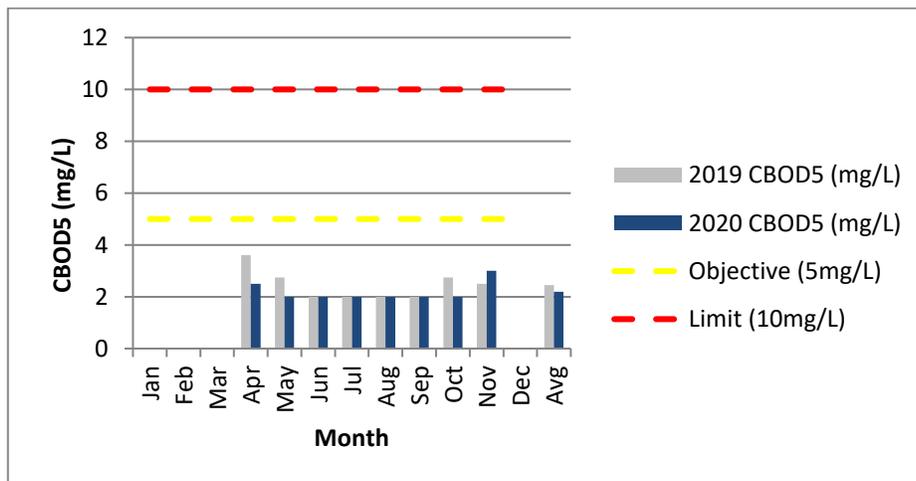


Chart 1b: Bayfield Lagoons Total Raw Sewage flows in 2020 compared to 2019 flows.



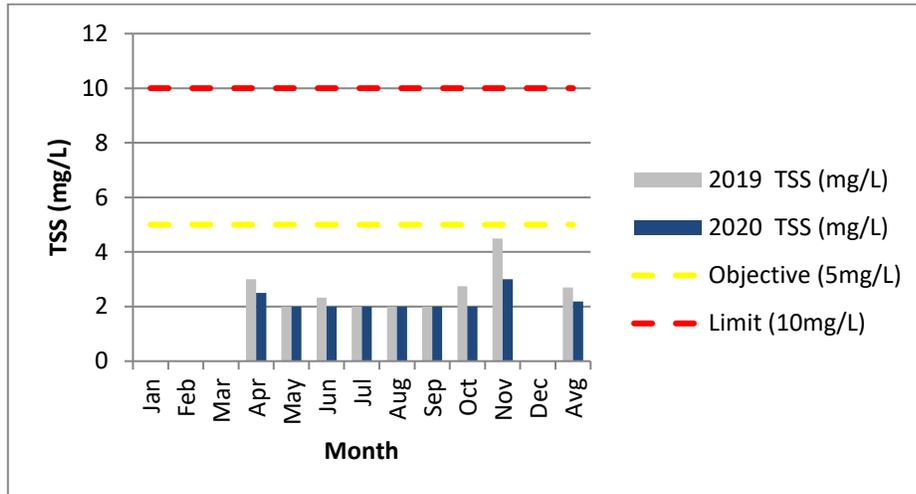
The 2020 final effluent annual average Carbonaceous Biochemical Oxygen Demand (CBOD5) concentration was < 2.19 mg/L with a maximum monthly concentration of < 3.0 mg/L recorded for November 2020; compliance limit is 10.0 mg/L. The 2020 seasonal average loading for CBOD5 was < 3.22 kg/d; compliance limit is 15.1 kg/d. Final effluent CBOD5 discharge concentrations were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits throughout 2020.

Chart 2: Bayfield Lagoons Average Monthly Effluent Carbonaceous Biochemical Oxygen Demand (CBOD5) results for 2020 compared to 2019. Monthly CBOD results met ECA identified limit and objective.



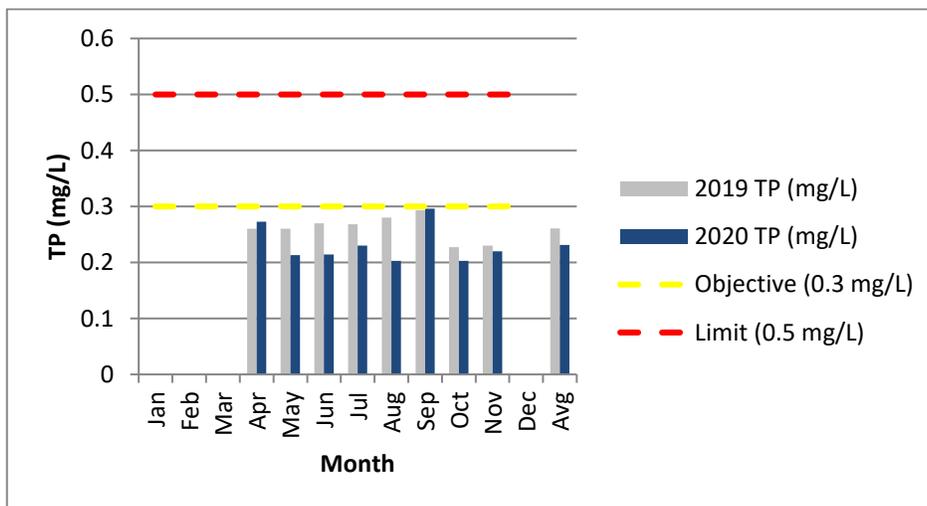
The 2020 final effluent annual average Total Suspended Solids (TSS) was < 2.19 mg/L with a maximum monthly concentration of < 3.0 mg/L recorded for November 2020; compliance limit is 10.0 mg/L. The 2020 seasonal average loading for TSS was < 3.22 kg/d; compliance limit is 15.1 kg/d. Final effluent TSS discharge concentrations were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits throughout 2020.

Chart 3: Bayfield Lagoons Average Monthly Effluent Total Suspended Solids (TSS) results for 2020 compared to 2019. Monthly TSS results met ECA identified limit and objective.



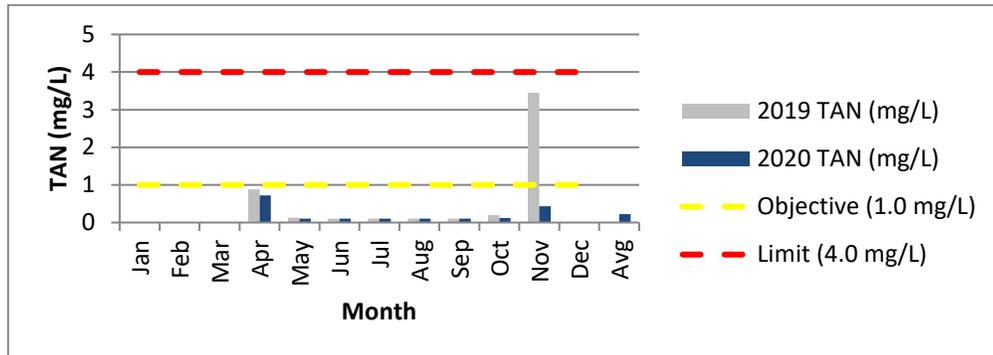
The 2020 final effluent annual average Total Phosphorus (TP) concentration was 0.23 mg/L with a maximum monthly concentration of 0.30 mg/L recorded for September 2020; compliance limit is 0.5 mg/L. The 2020 seasonal average loading for Total Phosphorus was 0.34 kg/d; compliance limit is 0.76 kg/d. Final effluent TP discharge concentrations were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits throughout 2020.

Chart 4: Bayfield Lagoons Average Monthly Effluent Total Phosphorus (TP) results for 2020 compared to 2019. Monthly TP results met ECA identified limit and objective.



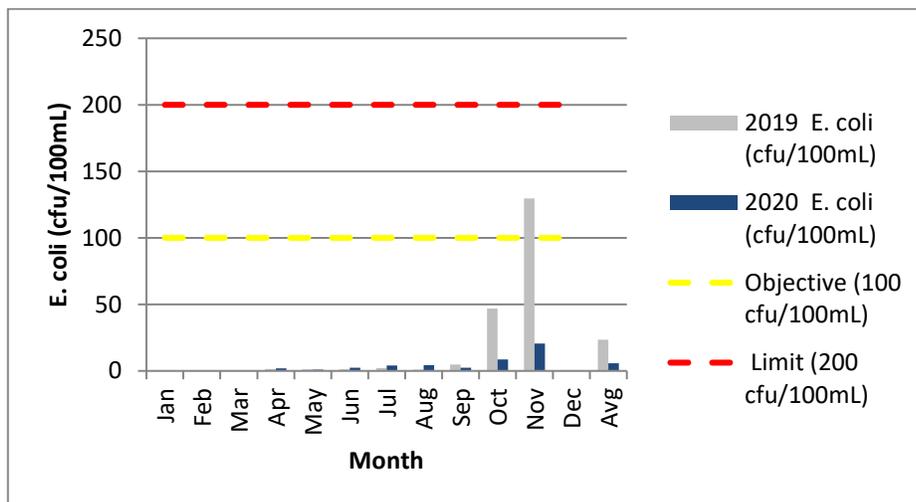
The 2020 final effluent annual average Total Ammonia Nitrogen (TAN) concentration was < 0.22 mg/L with a maximum monthly concentration of < 0.73 mg/L recorded for April 2020. Final effluent TAN discharge concentrations were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits throughout 2020; compliance limit is 4.0 mg/L.

Chart 5: Bayfield Lagoons Average Monthly Effluent Total Ammonia Nitrogen (TAN) results for 2020 compared to 2019. Monthly TAN results met ECA identified limit and objective.



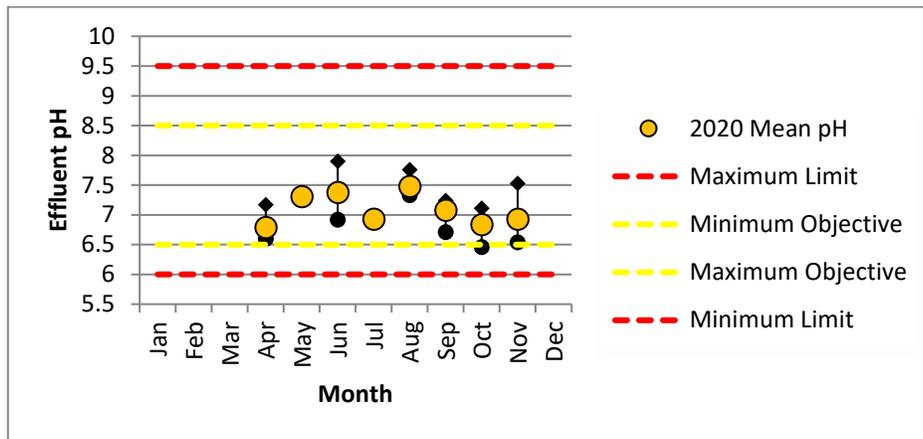
The 2020 final effluent annual E.coli Geometric Mean Density (GMD) was 5.68 cfu/100mL with a maximum monthly concentration of 20.61 cfu/100mL recorded for November 2020. Final effluent E.coli GMD averages were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits throughout 2020; compliance limit is 200.00 cfu/100mL.

Chart 6: Bayfield Lagoons Final Effluent E. coli Geometric Mean Density (GMD) results for 2020 compared to 2019. Monthly E.coli GMD results met ECA identified limit and objective.



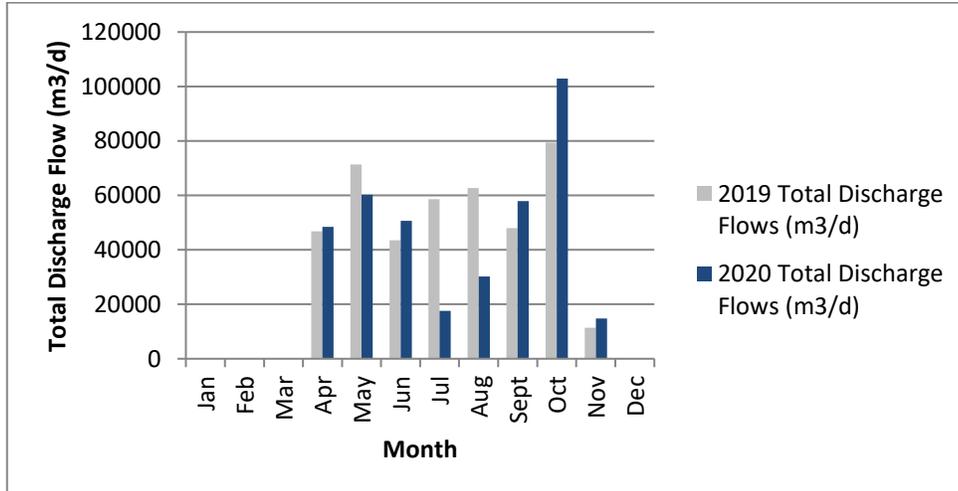
The 2020 annual average final effluent pH value was 7.10. The 2020 final effluent maximum pH value of 7.90 (7.9) was recorded in June and a minimum pH value of 6.46 (6.5) was recorded in October. Final effluent discharge pH values were compliant with Environmental Compliance Approval # 6250-AB4JCT Effluent Limits in 2020; compliance limits are 6.0 – 9.5

Chart 7: Bayfield Lagoons Final Effluent pH results for 2020. Daily pH results met ECA identified limit and objective. Note: November minimum pH recorded of 6.46 rounded to one decimal point meets objective of 6.5.



The lagoon discharged into the Bayfield River during the months of April, May, June, July, August, September, October and November of 2020. The total amount discharged into the Bayfield River for the 2020 reporting period was 382,767.00 m³. The average daily discharge flow was 1,103.06 m³/day with a maximum daily discharge flow of 10,888 m³/day recorded in October 2020.

Chart 8: Bayfield Lagoons Discharge Final Effluent Flows in 2020 compared to 2019 flows.



Overall the effluent discharged was adequately treated to meet the requirements of the limits identified in the Environmental Compliance Approval.

(b) a summary of the quality and quantity of leachate co-treated at the works and an overview of the success and adequacy of the co-treatment;

There was a no leachate hauled into the Bayfield Lagoon during the 2020 calendar year.

(c) a description of any operating problems encountered and corrective actions taken;

The rated capacity of the works is 1,072 m³/day. The facility rated capacity was exceeded in the months of January (22 days), February (11 days) , March (20 days) , April (11 days), June (8 days) and December (8 days) of 2020. Compliance is an annual average; daily exceedances are not a reportable event. The 2020 maximum raw sewage flow rate of 2,934 m³/day was recorded in January; this is 273.7 % of the facility rated capacity.

Pump stations required additional maintenance activities including pulling pumps to clear pump blockages and removing grease build up. Grease build up in the collection system wet wells is monitored and removed as required.

Non Compliance issue identified.

The Sarnia District MECP office was notified of a lost sample on September 25, 2020. The required raw sewage monthly sample collection was completed on August 11, 2020; the sample was packed and transported to SGS via the SGS Courier Service. Operator took a photo of the packed cooler and kept a copy of the related chain of custody form however no sample report was issued. The lab was contacted and a request for the missing raw sewage lab report was made; SGS could not locate lab report and launched an investigation. Investigation did not resolve issue. The August raw sewage sample was lost in transport.

The Bayfield Lagoon Sample Report Worksheet was revised to include a spot for operators to record raw sewage sample report results and confirm review of sample reports in a timely manner to avoid missed samples in the event of a delivery error.

(d) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

Regular-scheduled monthly preventative maintenance has been assigned and monitored using OCWA's Work Management System program (Maximo). Pierce Services is contracted to complete annual calibration services of all instrumentation for the Bayfield Sewage Lagoon System; see Appendix B (attached).

Equipment preventive maintenance requirements are built into the regular work schedule and corrective maintenance work requests are added according to their priority and staff and contractor availability. The following chart notes the number of maintenance work orders generated and completed in 2020.

Preventative Maintenance Work Orders Generated											
JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
13	12	14	18	12	14	12	13	19	33	15	16

Maintenance such as wet well cleaning, pump pulling, lifting device inspection, gas monitoring equipment inspection and fire extinguisher inspections were also completed. In-house meters used for pH analysis are calibrated as per manufacturer’s instructions.

Additional unscheduled maintenance is completed as needed. Additional maintenance completed during 2020 included:

- Periodic wet well cleaning;
- Repair and replacement of sand filter drainage pipes;
- Repairs to pump #2 at the Main Lift Pumping Station;
- Repairs to pump #1 at the Bayfield South Lift Pumping Station;
- Periodic rototilling of the sand filter beds;
- Replaced UPS at Main Lift Pumping Station;
- Installed a new alarm dialer at the Marina Pumping Station and the South Lift Pumping Station;
- Repairs completed to antenna to resolve communication errors.

(e) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

The effluent parameters specified in the Environmental Compliance Approval were analyzed by SGS Lakefield; SGS Lakefield is an accredited laboratory in Ontario.

The systems are monitored on an on-going basis to ensure proper operations. System checks include well level checks, pump hour meter readings, testing of alarms and running generators to ensure all systems are operating effectively.

Annually a facility sampling schedule calendar is prepared and reviewed with operational staff; the sampling schedule calendar identifies sample collection dates to meet regulatory requirements of the Environmental Compliance Approval.

Operators are on-site a minimum of once a week monitoring the facility and discharge.

The lab results are reviewed by the operators as they are received to ensure compliance.

(f) a summary of the calibration and maintenance carried out on all effluent monitoring equipment

In 2020 flow meter calibrations were completed by Pierce Services and Solutions Inc.

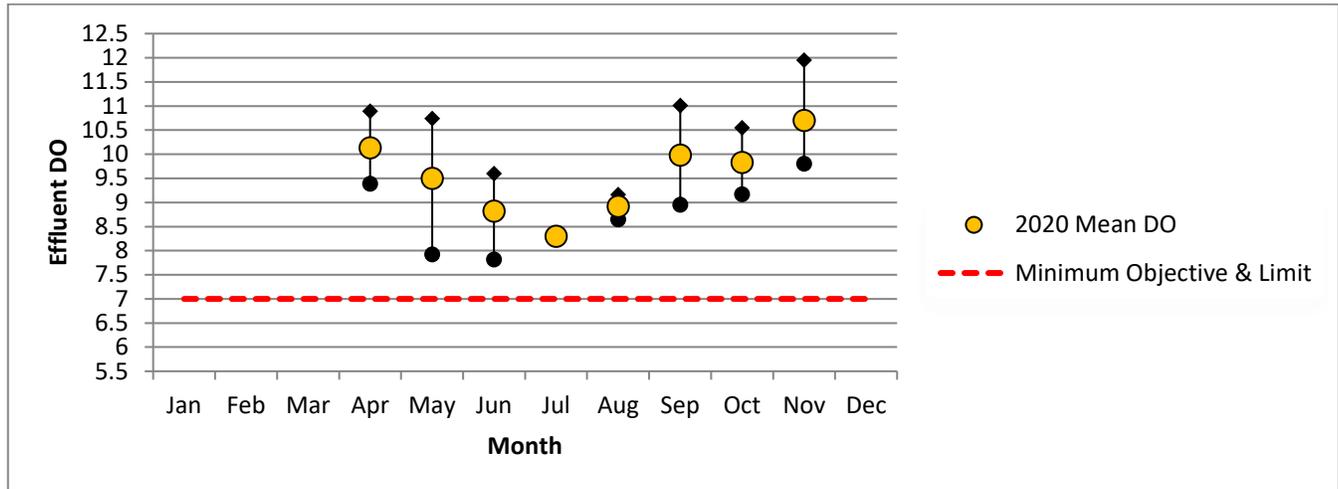
See Appendix B for calibration records.

(g) a description of efforts made and results achieved in meeting the objectives of Design Objectives Condition.

Effluent Objectives		2020 Annual Average Concentration (mg/L unless otherwise indicated)	2020 Maximum Monthly Concentration (mg/L unless otherwise indicated)
Effluent Parameter	Average Concentration Objective (mg/L unless otherwise indicated)		
CBOD5	5.0	< 2.19 mg/L	< 3.0 mg/L
Suspended Solids (TSS)	5.0	< 2.19 mg/L	< 3.0 mg/L
Total Phosphorus (TP)	0.3	0.23 mg/L	0.30 mg/L
Total Ammonia Nitrogen (TAN)	1.0	< 0.22 mg/L	< 0.73 mg/L
Dissolved Oxygen (DO)	7.0 (minimum)	7.82	Min. - Max. 7.82 – 11.95
E. Coli	100 organisms per 100 mL Monthly Geometric Mean Density	5.68 (organisms per 100ml)	20.61 (organisms per 100ml)
pH of the effluent maintained between 6.5 – 8.5, inclusive at all times.		7.10	Min. - Max. 6.46 – 7.90

Objectives were met consistently for all parameters monitored throughout the 2020 reporting period. See section e) graphing above.

Chart 9: Bayfield Lagoons Final Effluent Dissolved Oxygen (DO) results for 2020. Monthly DO results consistently met ECA identified objective minimum value of 7.0 mg/L in 2020.



Regular scheduled filter maintenance, alum dosage adjustments and effluent monitoring are completed by operational staff to strive and meet Environmental Compliance Approval design objectives.

See Appendix A for the Annual Summary of results

(h) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

There was no sludge hauled from the Bayfield Lagoon System in 2020. It was calculated that approximately 40 m³ of sludge was generated in during the 2020 reporting period. It is anticipated that approximately 40 m³ of sludge will be generated during the next reporting period.

(i) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

No complaints were received applicable to this reporting period.

(j) a summary of all Bypass, Overflow, spill or abnormal discharge events;

There were no bypass, overflow, spill or abnormal discharge events in 2020.

(k) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification

No Notice of Modifications was submitted to the Water Supervisor during this report period.

(l) a report summarizing all modifications completed as a result of Schedule B, Section 3;

No modifications were made as a result of Schedule B, Section 3 during this report period.

(m) any other information the Water Supervisor requires from time to time.

The Environmental Compliance Approval (ECA) # 6250-AB4JCT issued August 26, 2016 requires that Bypass & Overflow Reports be submitted to the Ministry's local office quarterly; reports were submitted as required.

REPORT PREPARED BY:

Deb Thomson

Process & Compliance Technician

Ontario Clean Water Agency

APPENDIX A

**ANNUAL SUMMARY
OF RESULTS
&
FLOW DATA**

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

From: 01/01/2020 to 31/12/2020

Facility: [6655] BAYFIELD WASTEWATER TREATMENT LAGOON

Works: [12002754]

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	<-Total-->	<-Avg-->	<-Max-->	<-Criteria-->
Flows:																
Eff. Flow: Total - Final Effluent (m³)	0.00	0.00	0.00	48486.00	60210.00	50715.00	17596.00	30245.00	57858.00	102927.00	14730.00	0.00	382767.00			
Eff. Flow: Avg - Final Effluent (m³/d)	0.00	0.00	0.00	1616.20	1942.26	1690.50	567.61	1680.28	1928.60	3320.23	491.00	0.00		1103.06		
Eff. Flow: Max - Final Effluent (m³/d)	0.00	0.00	0.00	5177.50	2178.00	2005.00	1978.00	2083.00	3015.00	10888.00	1210.00	0.00			10888.00	
Raw Flow: Monthly Total - Raw Sewage (m³)	45852.80	30974.00	36127.40	30624.00	28135.00	29941.00	27760.00	30003.90	24996.00	24786.00	23092.00	31512.00	363804.10			
Raw Flow: Monthly Avg - Raw Sewage (m³/d)	1479.12	1068.07	1165.40	1020.80	907.58	998.03	895.48	967.87	833.20	799.55	769.73	1016.52		993.45		
Raw Flow: Monthly Max - Raw Sewage (m³/d)	2934.00	1326.00	1599.00	1215.20	995.00	1125.00	1002.00	1098.00	975.00	871.00	941.00	1257.00			2934.00	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Eff: Avg cBOD5 - Final Effluent (mg/L)				< 2.500	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 3.000			< 2.188	< 3.000	
Loading: cBOD5 - Final Effluent (kg/d)				< 4.041	< 3.885	< 3.381	< 1.135	< 3.361	< 3.857	< 6.640	< 1.473			< 3.472	< 6.640	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw Sewage (mg/L)	68.000	42.000	42.000	54.000	74.000	175.000	130.000		108.000	54.000	78.000	80.000		82.273	175.000	
Raw: # of samples of BOD5 - Raw Sewage (mg/L)	1	1	1	1	1	1	1	0	1	1	1	1	11			
Eff: Avg BOD5 - Final Effluent (mg/L)					8.000					< 2.000				< 5.000	8.000	
Loading: BOD5 - Final Effluent (kg/d)					15.538					< 6.640				< 11.089	15.538	
Percent Removal: BOD5 - Raw Sewage (mg/L)					89.189					96.296					96.296	
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw Sewage (mg/L)	66.000	49.000	73.000	61.000	88.000	44.000	76.000		81.000	68.000	57.000	75.000		67.091	88.000	
Raw: # of samples of TSS - Raw Sewage (mg/L)	1	1	1	1	1	1	1	0	1	1	1	1	11			
Eff: Avg TSS - Final Effluent (mg/L)				< 2.500	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 2.000	< 3.000			< 2.188	3.000	10.0
Eff: # of samples of TSS - Final Effluent (mg/L)				4	4	5	1	3	5	4	3			29		
Loading: TSS - Final Effluent (kg/d)				< 4.041	< 3.885	< 3.381	< 1.135	< 3.361	< 3.857	< 6.640	< 1.473			< 3.472	6.640	
Percent Removal: TSS - Raw Sewage (mg/L)				95.902	97.727	95.455	97.368		97.531	97.059	94.737				97.727	
Total Phosphorus: TP:																
Raw: Avg TP - Raw Sewage (mg/L)	1.230	1.390	1.130	1.300	1.620	2.870	2.420		2.500	0.210	1.570	1.660		1.627	2.870	
Raw: # of samples of TP - Raw Sewage (mg/L)	1	1	1	1	1	1	1	0	1	1	1	1	11			
Eff: Avg TP - Final Effluent (mg/L)				0.273	0.213	0.214	0.230	0.203	0.296	0.203	0.220			0.231	0.296	
Eff: # of samples of TP - Final Effluent (mg/L)				4	4	5	1	3	5	4	3			29		
Loading: TP - Final Effluent (kg/d)				0.440	0.413	0.362	0.131	0.342	0.571	0.672	0.108			0.380	0.672	
Percent Removal: TP - Raw Sewage (mg/L)				79.038	86.883	92.544	90.496		88.160	3.571	85.987				92.544	
Nitrogen Series:																
Raw: Avg TKN - Raw Sewage (mg/L)	32.500	15.900	11.800	25.000	27.100	36.600	34.800		41.700	31.800	30.900	25.900		28.545	41.700	
Raw: # of samples of TKN - Raw Sewage (mg/L)	1	1	1	1	1	1	1	0	1	1	1	1	11			
Eff: Avg TAN - Final Effluent (mg/L)				< 0.725	< 0.100	< 0.100	0.100	< 0.100	< 0.100	< 0.120	< 0.433			< 0.222	0.725	
Eff: # of samples of TAN - Final Effluent (mg/L)				4	5	5	1	3	5	5	3			31		
Loading: TAN - Final Effluent (kg/d)				< 1.172	< 0.194	< 0.169	0.057	< 0.168	< 0.193	< 0.398	< 0.213			< 0.320	1.172	
Disinfection:																
Eff: GMD E. Coli - Final Effluent (cfu/100mL)				1.861	1.000	2.448	4.000	4.380	2.491	8.638	20.612			5.679	20.612	
Eff: # of samples of E. Coli - Final Effluent (cfu/100mL)				4	4	5	1	3	5	4	3			29		

**Ontario Clean Water Agency
Time Series Info Report**

From: 01/01/2020 to 31/12/2020

Facility Org Number: 6655
Facility Works Number: 120002754
Facility Name: BAYFIELD WASTEWATER TREATMENT LAGOON
Facility Owner: Municipality: The Municipality of Bluewater
Facility Classification: Class 1 Wastewater Treatment
Receiver: Bayfield River
Service Population: 1550.0
Total Design Capacity: 1072.0 m3/day

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
Final Effluent / Dissolved Oxygen: DO - mg/L																
Count IH	0	0	0	4	5	5	1	3	5	5	4	0	32			
Max IH				10.89	10.74	9.6	8.3	9.16	11.01	10.55	11.95				11.95	
Mean IH				10.128	9.496	8.824	8.3	8.923	9.978	9.83	10.703			9.657		
Min IH				9.39	7.92	7.82	8.3	8.65	8.95	9.17	9.8					7.82
Final Effluent / pH - ---																
Count IH	0	0	0	4	5	5	1	3	5	5	4	0	32			
Max IH				7.17	7.36	7.9	6.93	7.76	7.24	7.11	7.53				7.9	
Mean IH				6.788	7.306	7.384	6.93	7.483	7.078	6.842	6.925			7.103		
Min IH				6.6	7.26	6.92	6.93	7.33	6.71	6.46	6.54					6.46

APPENDIX B

**ANNUAL
CALIBRATIONS**



**Pierce Services
& Solutions Inc.**

PO Box 26027
Guelph, ON N1E 6W1

Phone: 519.820.4853
Fax: 519.824.9402

Flowmeter Report

max flow 1

Verification: X

Calibration:

Client: OCWA Bluewater
Description: Mag Flow Meter
Manufacturer: ABB
Model: Watermaster
Inventory No.: 249197

Location: Bayfield Lagoons
Date: 19-Aug-20
Checked By: Greg Pierce
Serial No.: 3K620000215245

Volocity	Input	As Found	As Left	Pass/Fail
0 m/s	0.00 l/s	0.00 l/s	0.00 l/s	Pass
1.99 m/s	3.9 l/s	3.92 l/s	3.92 l/s	
3.05 m/s	6.00 l/s	6.00 l/s	6.00 l/s	

Confirmed Run Mode: X

Returned to service: X

Service Comments:

Flowmeter Information

Flow Unit: l/s
Meter Size: 50 mm
Pipe Material: Cast Steel
Liner Material: PU
Range: 0-6 l/s
Tag Number: Park Flow



Comments:

Verification of original calibration

Signature: 
Greg Pierce, CCST



Pierce Services
& Solutions Inc.

PO Box 26027
Guelph, ON N1E 6W1

Phone: 519.820.4853
Fax: 519.824.9402

Flowmeter Report

max flow 1

Verification: X

Calibration:

Client: OCWA Bluewater
Description: Mag Flow Meter
Manufacturer: Krohne
Model: Aquaflex
Inventory No.: 249218

Location: Bayfield Lagoons
Date: 19-Aug-20
Checked By: Greg Pierce
Serial No.: C6100411000104769

Volocity	Input	As Found	As Left	Pass/Fail
0 m/s	0.00 l/s	0.00 l/s	0.00 l/s	Pass
1.21 m/s	59.64 l/s	59.64 l/s	59.64 l/s	
2.54 m/s	125.00 l/s	125.00 l/s	125.00 l/s	

Confirmed Run Mode: X

Returned to service: X

Service Comments:

Flowmeter Information

Flow Unit: l/s
Meter Size: 250 mm
Pipe Material: Cast Steel
Liner Material: PU
Range: 0-125 l/s
Tag Number: FIT 100



Comments:

Verification of original calibration

Signature: 
Greg Pierce, CCST



Pierce Services
& Solutions Inc.

519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Level Sensor

Assigned Number: Bayfield Lagoons Valve

Area Located: Bayfield Lagoons

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 3.500 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	% Error
	16.35 mA	2.47 m	2.47 m	

Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature: _____



#	Parameter	Value	#	Parameter	Value
P-0	Security	1954	P-50	OCM mA output	1
P-1	Units	1	P-51	OCM simulation	--
P-2	Mode of Measurement	1	P-52	Totalizer display factor	0
P-3	Empty Distance	3.739	P-53	Totalizer decimal point	2
P-4	Span	3.700	P-54	Low total	00.00
P-5	Blanking	0.300	P-55	High total	0000
P-6	Analog Output	2	P-56	Remote totalizer contact	0
P-7	Decimal Point	2	P-57	Flow sampler control	0
P-8	Relay 1, Function	0	P-58	Flow sampler control	1.000
P-9	Relay 1, Setpoint On	--	P-59	Time sampler control	--
P-10	Relay 1, Setpoint Off	--	P-60	Full Calibration	--
P-11	Relay 2, Function	0	P-61	Empty Calibration	--
P-12	Relay 2, Setpoint On	--	P-62	Measurement Offset	0.000
P-13	Relay 2, Setpoint Off	--	P-63	Sound Velocity at 20° C	344.1
P-14	Relay 3, Function	0	P-64	Velocity at P-65	344.1
P-15	Relay 3, Setpoint On	--	P-65	Air temperature	20 C
P-16	Relay 3, Setpoint Off	--	P-66	Maximum air temperature	163 C
P-17	Relay 4, Function	0	P-67	Minimum air temperature	9 C
P-18	Relay 4, Setpoint On	--	P-68	Fill damping	10.00
P-19	Relay 4, Setpoint Off	--	P-69	Empty damping	10.00
P-20	Relay 5, Function	0	P-70	Process rate display	0.000
P-21	Relay 5, Setpoint On	--	P-71	Process rate filter	1
P-22	Relay 5, Setpoint Off	--	P-72	Fuzz filter	1
P-23	Transducer, Submersible	0	P-73	Agitator discrimination	1
P-24	Pump 1, hours	0.000	P-74	Fail-safe mode	3
P-25	Pump 2, hours	0.000	P-75	Fail-safe timer	15.00
P-26	Pump 3, hours	0.000	P-76	Reading	0.43
P-27	Pump 4, hours	0.000	P-77	Material level	0.431
P-28	Pump 5, hours	0.000	P-78	Space or distance	3.308
P-29	Pump, run on, interval	0.000	P-79	Scope displays	---
P-30	Pump, run off, duration	0	P-80	Echo confidence	0:29
P-31	Transducer	0	P-81	Confidence threshold long	10
P-32	DLD milliamp output	1	P-82	Confidence threshold long	5
P-33	Inflow/discharge totaling	1	P-83	Echo strength	71
P-34	Tank Shape	0	P-84	Noise	24:36
P-35	Tank dimension A	0.000	P-85	Algorithms	1
P-36	Tank dimension L	0.000	P-86	TVT curve	1
P-37	Convert display	1.000	P-87	Range extension	20
P-38	Display offset	0.000	P-88	Number of transmit pulses	4
P-39	Display reading options	0	P-89	Software version	1.22
P-40	Primary measuring device	1	P-90	Memory test	PASS
P-41	Flow rate time units	4	P-91	LCD,LED and relay test	PASS
P-42	OCM exponent	1.550	P-92	mA output test	5.862
P-43	Flume Dimensions	1.000	P-93	Temperature sensor test	255.0
P-45	Maximum head	3.700	P-94	Transmitter test	PASS
P-46	Maximum flow rate	1000	P-95	Programmer test	PASS
P-47	Auto zero	--	P-96	Watchdog reset test	PASS
P-48	OCM low head cutoff	5.000	P-97	Trim for 4 mA	228
P-49	OCM decimal point	2	P-98	Trim for 20 mA	3528
			P-99	Master reset	



Pierce Services
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519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Level Sensor

Assigned Number: Alum Tank Level

Area Located: Bayfield Lagoons

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 3.700 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	% Error
	5.862 mA	0.431 m	0.431 m	

Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature: 



#	Parameter	Value	#	Parameter	Value
P-0	Security	1954	P-50	OCM mA output	1
P-1	Units	1	P-51	OCM simulation	--
P-2	Mode of Measurement	1	P-52	Totalizer display factor	0
P-3	Empty Distance	3.300	P-53	Totalizer decimal point	2
P-4	Span	3.000	P-54	Low total	00.00
P-5	Blanking	0.300	P-55	High total	0000
P-6	Analog Output	2	P-56	Remote totalizer contact	0
P-7	Decimal Point	2	P-57	Flow sampler control	0
P-8	Relay 1, Function	dE:8	P-58	Flow sampler control	1.000
P-9	Relay 1, Setpoint On	0.800	P-59	Time sampler control	--
P-10	Relay 1, Setpoint Off	0.900	P-60	Full Calibration	--
P-11	Relay 2, Function	dE:9	P-61	Empty Calibration	--
P-12	Relay 2, Setpoint On	2.050	P-62	Measurement Offset	0.000
P-13	Relay 2, Setpoint Off	1.100	P-63	Sound Velocity at 20° C	344.1
P-14	Relay 3, Function	dE:9	P-64	Velocity at P-65	343.5
P-15	Relay 3, Setpoint On	2.150	P-65	Air temperature	19.C
P-16	Relay 3, Setpoint Off	1.200	P-66	Maximum air temperature	21 C
P-17	Relay 4, Function	dE:9	P-67	Minimum air temperature	0 C
P-18	Relay 4, Setpoint On	2.200	P-68	Fill damping	10.00
P-19	Relay 4, Setpoint Off	1.300	P-69	Empty damping	10.00
P-20	Relay 5, Function	7	P-70	Process rate display	0.047
P-21	Relay 5, Setpoint On	0.000	P-71	Process rate filter	1
P-22	Relay 5, Setpoint Off	0.000	P-72	Fuzz filter	1
P-23	Transducer, Submersible	0	P-73	Agitator discrimination	1
P-24	Pump 1, hours	70.44	P-74	Fail-safe mode	3
P-25	Pump 2, hours	8636	P-75	Fail-safe timer	1.00
P-26	Pump 3, hours	153.8	P-76	Reading	1.13
P-27	Pump 4, hours	10.58	P-77	Material level	1.129
P-28	Pump 5, hours	0.000	P-78	Space or distance	2.171
P-29	Pump, run on, interval	0.000	P-79	Scope displays	---
P-30	Pump, run off, duration	0	P-80	Echo confidence	0:34
P-31	Transducer	0	P-81	Confidence threshold long	10
P-32	DLD milliamp output	1	P-82	Confidence threshold long	5
P-33	Inflow/discharge totaling	1	P-83	Echo strength	69
P-34	Tank Shape	0	P-84	Noise	11:22
P-35	Tank dimension A	0.000	P-85	Algorithms	1
P-36	Tank dimension L	0.000	P-86	TVT curve	1
P-37	Convert display	1.000	P-87	Range extension	20
P-38	Display offset	0.000	P-88	Number of transmit pulses	4
P-39	Display reading options	0	P-89	Software version	1.21
P-40	Primary measuring device	1	P-90	Memory test	PASS
P-41	Flow rate time units	4	P-91	LCD,LED and relay test	PASS
P-42	OCM exponent	1.550	P-92	mA output test	10.02
P-43	Flume Dimensions	1.000	P-93	Temperature sensor test	175.0
P-45	Maximum head	3.000	P-94	Transmitter test	PASS
P-46	Maximum flow rate	1000	P-95	Programmer test	PASS
P-47	Auto zero	--	P-96	Watchdog reset test	PASS
P-48	OCM low head cutoff	5.000	P-97	Trim for 4 mA	221
P-49	OCM decimal point	2	P-98	Trim for 20 mA	3494
			P-99	Master reset	



Pierce Services
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519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Level Sensor

Assigned Number: Wet Well Level

Area Located: Bayfield Main Lift Station

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 3.300 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	% Error
	10.02 mA	1.129 m	1.129 m	

Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature: _____



Pierce Services
& Solutions Inc.

519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Level Sensor

Assigned Number: Wet Well Level

Area Located: Bayfield South Lift Station

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger 100

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 5.000 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	% Error
	8.77 mA	1.39 m	1.39 m	

Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature: _____



Tag # Wet Well Level North Lift
Date: August 19, 2020

#	Parameter	Value	#	Parameter	Value
P-0	Security	1954	P-50	OCM mA output	1
P-1	Units	1	P-51	OCM simulation	--
P-2	Mode of Measurement	1	P-52	Totalizer display factor	0
P-3	Empty Distance	3.75	P-53	Totalizer decimal point	2
P-4	Span	3.45	P-54	Low total	00.00
P-5	Blanking	0.300	P-55	High total	0000
P-6	Analog Output	2	P-56	Remote totalizer contact	0
P-7	Decimal Point	2	P-57	Flow sampler control	0
P-8	Relay 1, Function	dE:8	P-58	Flow sampler control	1.000
P-9	Relay 1, Setpoint On	0.600	P-59	Time sampler control	--
P-10	Relay 1, Setpoint Off	0.650	P-60	Full Calibration	--
P-11	Relay 2, Function	dE:9	P-61	Empty Calibration	--
P-12	Relay 2, Setpoint On	1.55	P-62	Measurement Offset	0.000
P-13	Relay 2, Setpoint Off	0.85	P-63	Sound Velocity at 20° C	344.1
P-14	Relay 3, Function	dE:9	P-64	Velocity at P-65	344.7
P-15	Relay 3, Setpoint On	1.65	P-65	Air temperature	21 C
P-16	Relay 3, Setpoint Off	0.95	P-66	Maximum air temperature	24 C
P-17	Relay 4, Function	7	P-67	Minimum air temperature	3 C
P-18	Relay 4, Setpoint On	--	P-68	Fill damping	10.00
P-19	Relay 4, Setpoint Off	--	P-69	Empty damping	10.00
P-20	Relay 5, Function	1	P-70	Process rate display	0.01
P-21	Relay 5, Setpoint On	1.720	P-71	Process rate filter	1
P-22	Relay 5, Setpoint Off	1.69	P-72	Fuzz filter	1
P-23	Transducer, Submersible	1	P-73	Agitator discrimination	1
P-24	Pump 1, hours	6.794	P-74	Fail-safe mode	3
P-25	Pump 2, hours	8829	P-75	Fail-safe timer	0.5
P-26	Pump 3, hours	280.9	P-76	Reading	1.12
P-27	Pump 4, hours	0.000	P-77	Material level	1.121
P-28	Pump 5, hours	0.000	P-78	Space or distance	2.629
P-29	Pump, run on, interval	0.000	P-79	Scope displays	---
P-30	Pump, run off, duration	0	P-80	Echo confidence	0:35
P-31	Transducer	102	P-81	Confidence threshold long	10
P-32	DLD milliamp output	1	P-82	Confidence threshold long	5
P-33	Inflow/discharge totaling	1	P-83	Echo strength	71
P-34	Tank Shape	0	P-84	Noise	16:23
P-35	Tank dimension A	0.000	P-85	Algorithms	1
P-36	Tank dimension L	0.000	P-86	TVT curve	1
P-37	Convert display	1.000	P-87	Range extension	20
P-38	Display offset	0.000	P-88	Number of transmit pulses	4
P-39	Display reading options	5	P-89	Software version	1.22
P-40	Primary measuring device	1	P-90	Memory test	PASS
P-41	Flow rate time units	4	P-91	LCD,LED and relay test	PASS
P-42	OCM exponent	1.550	P-92	mA output test	9.197
P-43	Flume Dimensions	1.000	P-93	Temperature sensor test	172.0
P-45	Maximum head	3.45	P-94	Transmitter test	PASS
P-46	Maximum flow rate	1000	P-95	Programmer test	PASS
P-47	Auto zero	--	P-96	Watchdog reset test	PASS
P-48	OCM low head cutoff	5.000	P-97	Trim for 4 mA	216
P-49	OCM decimal point	2	P-98	Trim for 20 mA	3489
			P-99	Master reset	

Site Location: Bayfield North Lift Station



Pierce Services
& Solutions Inc.

519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Level Sensor

Assigned Number: LIT 101

Area Located: North Lift Bayfield

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 3.750 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	% Error
	9.197 mA	1.121 m	1.121 m	

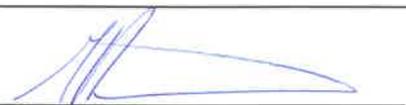
Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature: 

Instrument Verification Sheet

519.820.4853 Fax 519.824.9402

Client Name: Ontario Clean Water Agency

Date: August 19, 2020

Equipment Description: Flow Transmitter

Assigned Number: Lagoon Filter Flow

Area Located: Bayfield Lagoons

AMMS Number: N/A

Instrument Data

Manufacturer: Krohne

Model Number: AquaFlux

Type: Magmeter

Serial Number: A00 12009

Range: 0-300 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Wastewater

Meter Size: 300mm

PASS/FAIL: Pass

Calibration Data

Input	Input	Theoretical	As Found	Pass/Fail
Velocity		133.3 l/s	133.3 l/s	Pass

Confirmed Run Mode:

Placed back in service:

Comments:
Verification of original calibration only.



Checked By: Greg Pierce CCST

Signature: _____



**Pierce Services
& Solutions Inc.**

PO Box 26027
Guelph, ON N1E 6W1

Phone: 519.820.4853
Fax: 519.824.9402

Flowmeter Report

Verification: X

Calibration:

Client: OCWA Bluewater
Description: Ultrasonic
Manufacturer: Milltronics
Model: OCM III
Inventory No.: 249100

Location: Bayfield Lagoons
Date: 19-Aug-20
Checked By: Greg Pierce
Serial No.: _____

Volocity	Input	Theroretical	As Left	Pass/Fail
	0 cm	0.00 l/s	0.00 l/s	Pass
	10 cm	4.364 l/s	4.3652 l/s	Pass
	20 cm	24.69 l/s	24.69334 l/s	Pass
	30 cm	68.03 l/s	68.04685 l/s	Pass
	42 cm	157.8 l/s	157.8 l/s	Pass

Confirmed Run Mode: X

Returned to service: X

Service Comments:

Flowmeter Information

Flow Unit: l/s
Meter Size: 200 mm
Pipe Material: Stainless Steel
Flume Type: 90° V Notch Weir
Range: 0-157.8 l/s
Tag Number: FIT 101

Comments:

Verified with ISCO Open Channel Flow Book

Signature: _____

Greg Pierce, CCST

#	Parameter	Value	#	Parameter	Value
P0	Language	0	D0	Head	20.89
P1	Dimensional Units	0	D1	Flow Rate	27.33489
P2	Temperature Units	0	D2	Short Total	506134.4
P3	Primary Element	0	D3	Maximum Flow Rate	155.5088
P4	Method of Calculation	1	D4	Minimum Flow Rate	0
P5	Flow Rate Units	0	D5	Temperature	19.87
P6	Flow at Maximum Head	157.8	D6	Maximum Temperature	30.4
P7	Height of Maximum Head	42	D7	Minimum Temperature	-3.38
P8	Volts in at Zero Velocity	-	D8	Velocity	-
P9	Velocity at 5 Volts In	-	D9	Nominal Target Range	93
P10	Velocity at maximum flow	-	D10	Analog Milliamps	6.73
P13	Display Damping	0	D11	Internal DC Volts	29.99
P14	Display Lighting	0	D12	Velocity Volts	-
P15	Relay 1 Assignment	0	D13	Auxiliary Input Volts	0.01
P16	Relay 1 High Set Point	-	D14	Temperature Sensor Ohms	9661
P17	Relay 1 Low Set Point	-	D15	Self-test Checksum	0000H
P18	Relay 2 Assignment	0	D16	Restarts	6408
P19	Relay 2 High Set Point	-	D17	Exceptions	0
P20	Relay 2 Low Set Point	-	D18	Valid Echoes per 100	98
P21	Relay 3 Assignment	0			
P22	Relay 3 High Set Point	-			
P23	Relay 3 Low Set Point	-			
P24	mA assignment	0	F2	Run Mode l/s	0
P25	If Custom mA, 20 mA =?	-		Total X 1000	
P26	mA Span	0	F6	Software Identification Number	
P27	mA Damping	10	F7	View Min/Max Data	
P28	mA Options	0		Max Flow	155.5
P29	Fail-safe Time	60		Time	11:57:44
P30	Fail-safe Analog Mode	0		Date	17/02/20
P31	Fail-safe Analog mA	0		Min Flow	0
P32	Totalizer Multiplier	6		Time	23:26:23
P33	Flow Rate Display	2		Date	12/06/20
P34	Printer Mode	0		Max Temperature	30.39
P35	Printer Timing	-		Time	10:24:32
P36	Measurement Interval	0		Date	20/05/20
P37	Serial Data Rate	5		Min Temperature	-3.38
P38	Site Number	0		Time	23:12:09
P39	Data Logging Rate	2		Date	11/10/19
P40	Log Rapid Set point	-	F8	Reset Min/Max Data	Yes
P41	Log Normal Set point	-			
P42	Head Determination	0			
P43	Volts in For Zero Head	-			
P44	Head at 5 Volts In	-			
P45	Low Flow Cut-off Head	0			
P46	Range at Zero Head	110.3426			
P47	Blanking Distance	30.48264			
U0	Exponent	2.5			

Site Location: Bayfield Lagoons

CaAug1920 Bayfield 1