# **ANNUAL REPORT**

# **MOUNT FOREST** WASTEWATER TREATMENT SYSTEM

# FOR THE PERIOD: JANUARY 1, 2019 – DECEMBER 31, 2019

Prepared for the Township of Wellington North by the Ontario Clean Water Agency





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#### 1. System Description

In November 2008, the Mount Forest Water Pollution Control Plant began operation. The plant consists of a raw water pumping station, which used to be the old sewage treatment plant. This flow now enters the new Influent Works building which contains a vertical bar screen, a washer screw compactor, a circular grit chamber complete with grit extraction equipment and blowers, and a grit dewatering screw all sized to accommodate the hydraulic peak flow rate of 15,000 m<sup>3</sup>/d. This conventional wastewater plant uses diffused air supplied by two (2) duty aeration blowers and one (1) standby blower to supply its two (2) aeration tanks and supplements its phosphorous removal using alum. The plant applies its coagulant aid prior to its two square final clarifiers which are fitted with sludge removal scrapers.

Two final effluent single media filters including traveling backwash mechanism and return of backwash to the head of the aeration tanks follow the final clarifiers. The effluent then flows though the ultraviolet disinfection system which consists of two banks, one duty and one standby, with each bank sized for the Peak Flow Rate. The plant is designed to remove suspended solids, BOD<sub>5</sub>, and phosphorus from the wastewater. Chlorination of bypasses which are metered is done though a manual sodium hypochlorite drip into the existing chlorine contact chamber at the Raw Sewage Pumping Station.

The sludge digestion and storage is located at the new site, and receives sludge from the Mount Forest WPCP and from the Arthur WPCP on an as need basis. Sludge treatment system consists of a five (5) tank aerobic sludge digestion system with a total storage volume of 3,951m<sup>3</sup>, equipped with coarse bubble diffusers, submersible mixers and supernatant decanting.

An overview of Mount Forest Wastewater Treatment Plant can be found in Table 1:

Facility Name	Mount Forest Wastewater Treatment Plant
Facility Type	Extended Air STP with Tertiary Treatment
Plant Classification	WWT II
Works Number	120001381
Design Capacity	2,818 m <sup>3</sup> /day
Receiving Water	South Saugeen River
Certificate of Approval	6134-73FHHU

 Table 1. Mount Forest Wastewater Treatment Plant Overview

#### 2. Monitoring Data and Comparison to Effluent Limits

As per Section 10.(5)(a) of C of A 6134-73FHHU, a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works is required.

#### 2.1 Sampling Frequency

Both influent (raw sewage) and effluent are sampled on a regular basis. The sampling types and frequencies are summarized in Table 2 and Table 3. The sampling frequencies meet the requirements set out in Section 9 of C of A 6134-73FFHHU.

Parameter	Sample Type	Frequency
BOD <sub>5</sub> * 24-hour Composite		Weekly
Total Suspended Solids*	24-hour Composite	Weekly
Total Phosphorous*	24-hour Composite	Weekly
Total Kjeldahl Nitrogen*	24-hour Composite	Weekly

 Table 2. Influent (Raw Sewage) Monitoring – Sampling Frequencies

\*Refer to Appendix A for monthly sample results.

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**Table 3.** Effluent Sampling Monitoring – Sampling Frequencies

Parameters	Sample Type	Frequency
CBOD <sub>5*</sub>	24-hour Composite	Weekly
Total Suspended Solids*	24-hour Composite	Weekly
Total Phosphorous*	24-hour Composite	Weekly
Total Ammonia Nitrogen*	24-hour Composite	Weekly
Nitrate Nitrogen*	24-hour Composite	Weekly
E. Coli*	Grab	Weekly
рН	Grab (on-site)	Weekly
Temperature	Grab (on-site)	Weekly

\*Refer to Appendix A for monthly sample results.

#### 2.2 Effluent Objectives and Effluent Limits

The effluent objectives as per Section 6 of C of A 6134-73FHHU for the Mount Forest Wastewater Treatment Plant are:

 Table 4. Effluent Objectives as per Section 6 of C of A 6134-73FHHU

Effluent Parameter	Concentration Objective (mg/L)	Loading Objective (kg/day)
CBOD <sub>5</sub>	6.0	17.0
Total Suspended Solids	10.0	17.0
Total Ammonia Nitrogen		
Dec 01 to Apr 30	4.0	11.3
May 01 to Nov 30	1.5	4.2
Total Phosphorous	0.3	0.85
Free Chlorine Residual	0	-
E.Coli	100 CFU/100mL	-
	(Monthly Geometric Mean Density)	

The effluent limits that are to be met as per Section 7 of C of A 6134-73FHHU for the Mount Forest Wastewater Treatment Plant are found in Table 5. Any exceedance with the limits found in Table 5 constitutes a non-compliance with C of A 6134-73FHHU.

Table 5.	Effluent Limits as	per Section 7 of C of A 6134-73FHHU

Effluent Parameter	Concentration Limit (mg/L)	Loading Limit (kg/day)				
CBOD <sub>5</sub>	12.5	35				
Total Suspended Solids	12.5	35				
Total Ammonia Nitrogen						
Dec 01 to Apr 30	6.0	17.0				
May 01 to Nov 30	2.5	7.0				
Total Phosphorous	0.37	1.05				
Free Chlorine Residual	0.02	-				
E.Coli	200 CFU/100mL	-				
(Monthly Geometric Mean Density)						
pH of the effluent to be maintained between 6.0 to 9.0, inclusive.						

#### 2.3 Comparison of Data to Effluent Objectives and Effluent Limits

Analytical and monitoring data for the Mount Forest Wastewater Treatment Facility is stored in OCWA's data management system (WISKI). Annual and monthly averages for flows, CBOD<sub>5</sub>, BOD<sub>5</sub>, Suspended Solids, Total Phosphorous, Nitrogen-series and E.coli can be found in Appendix A. A comparison of analytical data from effluent samples to the effluent objectives and effluent limits are shown in the tables below:

Table 6.

	CBOD <sub>5</sub>					
	Monthly Average Concentration (mg/L)	Within Objectives (6.00 mg/L)	Within Limits (12.50 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (17.00 kg/d)	Within Limits (35.00 kg/d)
January	2.00	Yes	Yes	4.51	Yes	Yes
February	2.50	Yes	Yes	5.83	Yes	Yes
March	2.75	Yes	Yes	7.85	Yes	Yes
April	2.40	Yes	Yes	8.86	Yes	Yes
May	2.50	Yes	Yes	6.77	Yes	Yes
June	2.25	Yes	Yes	4.45	Yes	Yes
July	3.20	Yes	Yes	5.22	Yes	Yes
August	2.00	Yes	Yes	2.99	Yes	Yes
September	2.25	Yes	Yes	3.18	Yes	Yes
October	2.00	Yes	Yes	2.33	Yes	Yes
November	2.00	Yes	Yes	3.18	Yes	Yes
December	2.00	Yes	Yes	3.27	Yes	Yes

Table 7.

		Total Suspended Solids						
	Monthly Average Concentration (mg/L)	Within Objectives (10.00 mg/L)	Within Limits (12.50 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (28.20 kg/d)	Within Limits (35.00 kg/d)		
January	2.60	Yes	Yes	5.86	Yes	Yes		
February	4.75	Yes	Yes	11.07	Yes	Yes		
March	5.25	Yes	Yes	14.98	Yes	Yes		
April	5.60	Yes	Yes	20.67	Yes	Yes		
May	8.25	Yes	Yes	22.35	Yes	Yes		
June	5.75	Yes	Yes	11.38	Yes	Yes		
July	2.40	Yes	Yes	3.92	Yes	Yes		
August	2.25	Yes	Yes	3.37	Yes	Yes		
September	2.50	Yes	Yes	3.53	Yes	Yes		
October	2.80	Yes	Yes	3.27	Yes	Yes		
November	2.75	Yes	Yes	4.38	Yes	Yes		
December	2.80	Yes	Yes	4.58	Yes	Yes		

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#### Table 8.

		Total Ammonia Nitrogen								
				(Ammo	onia Nitroge	n + Ammon	ium Nitrogen)			
	Monthly Average Concentration (mg/L)	Within Objectives (Dec 01-Apr 30 4.00 mg/L)	Within Objectives (May 01-Nov 30 1.50 mg/L)	Within Limits (Dec 01-Apr 30 6.00 mg/L)	Within Limits (May 01-Nov 30 2.50 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (Dec 01-Apr 30 11.30 kg/d)	Within Objectives (May 01-Nov 30 4.20 kg/d)	Within Limits (Dec 01-Apr 30 17.00 kg/d)	Within Limits (May 01-Nov 30 7.00 kg/d)
January	0.10	Yes	n/a	Yes	n/a	0.23	Yes	n/a	Yes	n/a
February	0.58	Yes	n/a	Yes	n/a	1.34	Yes	n/a	Yes	n/a
March	0.15	Yes	n/a	Yes	n/a	0.43	Yes	n/a	Yes	n/a
April	0.10	Yes	n/a	Yes	n/a	0.37	Yes	n/a	Yes	n/a
May	0.10	n/a	Yes	n/a	Yes	0.27	n/a	Yes	n/a	Yes
June	0.10	n/a	Yes	n/a	Yes	0.20	n/a	Yes	n/a	Yes
July	0.14	n/a	Yes	n/a	Yes	0.23	n/a	Yes	n/a	Yes
August	0.15	n/a	Yes	n/a	Yes	0.23	n/a	Yes	n/a	Yes
September	0.45	n/a	Yes	n/a	Yes	0.64	n/a	Yes	n/a	Yes
October	0.10	n/a	Yes	n/a	Yes	0.12	n/a	Yes	n/a	Yes
November	0.13	n/a	Yes	n/a	Yes	0.20	n/a	Yes	n/a	Yes
December	0.10	Yes	n/a	Yes	n/a	0.16	Yes	n/a	Yes	n/a

#### Table 9.

		Total Phosphorus					
	Monthly Average Concentration (mg/L)	Within Objectives (0.300 mg/L)	Within Limits (0.370 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (0.85 kg/d)	Within Limits (1.05 kg/d)	
January	0.158	Yes	Yes	0.356	Yes	Yes	
February	0.100	Yes	Yes	0.233	Yes	Yes	
March	0.093	Yes	Yes	0.264	Yes	Yes	
April	0.112	Yes	Yes	0.413	Yes	Yes	
May	0.140	Yes	Yes	0.379	Yes	Yes	
June	0.125	Yes	Yes	0.247	Yes	Yes	
July	0.068	Yes	Yes	0.111	Yes	Yes	
August	0.088	Yes	Yes	0.131	Yes	Yes	
September	0.095	Yes	Yes	0.134	Yes	Yes	
October	0.068	Yes	Yes	0.079	Yes	Yes	
November	0.140	Yes	Yes	0.223	Yes	Yes	
December	0.216	Yes	Yes	0.353	Yes	Yes	

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#### Table 10.

	E.coli					
	Monthly Geometric Mean Density (CFU/100mL)	Within Objectives (100 CFU/100mL)	Within Limits (200 CFU/100mL)			
January	1.52	Yes	Yes			
February	3.72	Yes	Yes			
March	2.00	Yes	Yes			
April	3.29	Yes	Yes			
Мау	10.95	Yes	Yes			
June	6.06	Yes	Yes			
July	4.00	Yes	Yes			
August	2.74	Yes	Yes			
September	2.00	Yes	Yes			
October	14.52	Yes	Yes			
November	2.38	Yes	Yes			
December	2.49	Yes	Yes			

#### Table 11. Annual Effluent Results Summary, 2019

Parameters	Average	Minimum	Maximum	Average Annual Loading
CBOD <sub>5</sub>	2.32	2.00	6.00	4.87
Total Suspended Solids	3.91	2.00	10.00	9.11
Total Phosphorus	0.118	0.340	0.050	0.244
Total Ammonia Nitrogen	0.18	0.10	2.00	0.37
E.Coli	9.57	0	240.00	-
рН	7.84	7.38	8.45	-
Temperature	8.79	5.60	18.20	-

#### 2.4 Additional Monitoring Parameters

The following parameters in Table 12 do not have limits or objectives but are monitored on a regular basis (see Section 2.1 for sampling frequency) as required by C of A 6134-73FHHU. Table 12 summarizes the monitoring data for the reporting period.

Raw Sewage Quality:

Table 12. Raw Sewage Monitoring Parameters as required by C of A 6134-73FHHU for Mount Forest Wastewater Treatment Plant, 2019

Parameter	Average	Minimum	Maximum
BOD <sub>5</sub> * (mg/L)	81.54	34.50	138.40
Total Suspended Solids* (mg/L)	70.45	40.00	127.25
Total Phosphorous* (mg/L)	1.99	0.92	2.94
Total Kjeldahl Nitrogen* (mg/L)	21.68	10.04	32.93

\* Refer to the Appendix A PAR for monthly sample results.

#### 2.5 Overview of Success and Adequacy of the Works

The annual average effluent TSS concentration was 3.98 mg/L with an average removal efficiency of 92.82%. The annual average effluent Total Phosphorus concentration was 0.117 mg/L with an average removal efficiency of 93.14%.

The bacteriological quality of the effluent complied with the certificate of approval requirement of <200 CFU per 100 mL sample. The annual geometric mean density of organisms for 2019 was 4.64 CFU per 100 mL, indicating extremely effective effluent disinfection.

The total raw sewage volume of wastewater treated in 2019 was 714,415.30 m<sup>3</sup>. The annual average daily flow of raw sewage was 1959.69 m<sup>3</sup>/day was 69.54 % of the design flow (2,818 m<sup>3</sup>/day). The maximum peak flow of 6348.40 m<sup>3</sup>/day occurred during March due to higher seasonal temperatures which resulted in rapid snow melt as well as heavy precipitation. This represents a peak flow of 225.28% of the rated capacity. The wastewater treatment plant operated within the rated capacity 85% of the time (310 out of 365 days of the year)

The sewage treatment operations for 2019 provided effluent quality that met all of the effluent requirements of the CofA and demonstrates average percentage of removal efficiency (>92%) for key parameters. The effluent for 2019 was within all effluent limits and all effluent objectives set out in the CofA. Based on this evidence, the current sewage treatment program is deemed adequate. OCWA will continue to stay within effluent limits and will continue to aim to meet effluent objectives during each reporting period.

#### 3. Operating Problems and Corrective Actions

As per Section 10.(5)(b) of C of A 6134-73FHHU, a description of any operating problems encountered and corrective actions taken is required.

There were no operating problems encountered or corrective actions required at the Mount Forest Water Pollution Control Plant during 2019 that affected the quality of the effluent leaving the plant. All repairs/maintenance can be found in Section 4.

#### 4. Major Maintenance Activities

As per 10.(5)(c) of C of A 6134-73FHHU, a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanisms or thing forming part of the works is required.

Plant maintenance, including non-scheduled maintenance is monitored using Maximo Workplace Management System. All routine and preventative maintenance was conducted as scheduled in 2019.

For 2019, major maintenance activities that occurred include:

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#### Plant:

- Digester Blower repair
- Hour Meter installations
- HVAC maintenance and repairs
- Decant Chamber Hatch repair
- Backflow Prevention inspections
- Flow Meter calibrations
- Gas Meter calibrations
- UPS Battery replacement
- Auto Bar Screen repair
- Scum Pit and Clarifier cleaning
- Sand Filter inspections
- UV Unit servicing
- Aeration Blower #1 Flange installation
- Septage Hose and Adapter repair
- Aeration Tank #1 cleaning and inspection
- Skimmer Unit wiring and repair

#### Cork St. Pumping Station:

- Pump #2 cleaning and repair
- Check Valve repair

#### **Durham St. Pumping Station:**

- Generator Fuel Pump replacement
- HMI Panel replacement

#### North Water St. Pumping Station:

- Batteries and Trickle Charger replacement for the Generator
- Wet Well cleanout

#### 5. Effluent Quality Assurance and Control

As per 10.(5)(d) of C of A 6134-73FHHU, a summary of any effluent quality assurance or control measures undertaken in the reporting period is required:

All laboratory analyzed raw sewage and effluent samples (Section 2.1) are analyzed by SGS Canada Inc., which is an ISO 17025 accredited laboratory. In-house tests are conducted for monitoring purposes by licensed operators using standardized methods. The results from in-house tests are used to determine treatment efficiency and to effectively maintain process control. Calibrations and preventative maintenance are performed on facility equipment and monitoring equipment, see Section 4 for more details. In addition to sample analysis, preventative maintenance is scheduled for equipment at the sewage treatment plant and pumping stations at regular frequency (frequency depends on the equipment and type of maintenance). Maintenance activities are scheduled in the work management system Maximo.

The sewage system is operated and maintained by licensed Operators. The mandatory licensing program for operators of sewage treatment facilities in Ontario is regulated under the Ontario Water Resources Act (OWRA) Ontario Regulation 129/04. A licensed individual meets the education and experience requirements and has successfully passed the licensing examination.

The following are certified operators who operated this facility during 2019 with current certified classification, certificate numbers and certificate expiry dates.

TABLE 13.

Operator	Level	Certificate #	Expiry Date
Dwight Hallahan	WWT 2	15499	Apr 30,2022
	WWC 1	16002	Oct 31, 2022
Dan Yake	WWT 2	57390	Jul 31, 2022
	WWC 1	69121	Jan 31, 2023
Steve Miller	WWT 4	15422	Jan 31, 2022
	WWC 2	17899	Jan 31, 2022

#### 6. Calibration and Maintenance Procedures

As per 10.(5)(e) of C of A 6134-73FHHU, a summary of the calibration and maintenance carried out on all *effluent monitoring equipment* is required.

All in-house monitoring equipment is calibrated/verified as per manufacturer's recommendations. Monitoring and metering equipment is also calibrated by a third party on an annual basis. Preventative maintenance is scheduled for all equipment at the sewage treatment plant and pumping stations at regular frequency (frequency depends on the equipment and type of maintenance). Maintenance activities are scheduled within the work management system Maximo, upon completion, Operators set the work order to complete. On a monthly basis, preventative work orders are reviewed for completion.

Flowmetrix Technical Services Inc. was contracted to calibrate flow measuring equipment on September 20, 2019. Copies of these calibration reports can be found in Appendix C of this report.

#### 7. Efforts and Results Achieved in Meeting Effluent Objectives

As per 10.(5)(f) of C of A 6134-FHHU, a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6 is required.

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

OCWA as the Operating Authority (on behalf of the Owner) has made best efforts to stay within the Effluent Objectives in the CofA. These efforts are supported through:

- Continuous monitoring equipment
- Regular plant inspections/checks

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- In-house sampling and testing
- Laboratory (3<sup>rd</sup> party) analysis of influent and effluent samples
- Data review
- Process optimization and adjustments (as required)
- Scheduled/preventative maintenance
- Repairs as necessary

A summary of the effluent quality in comparison to the effluent objectives can be found in Tables 6-10 of section 2.3 of this report. These results show that sewage treatment operations for 2019 provided effluent quality that was within all effluent objectives outlined in the CofA and minimized environmental impairment.

#### 8. Sludge Generation

As per 10.(5)(g) of C of A 6134-FHHU, 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 is required.

Digested sludge produced at the Mount Forest Wastewater Treatment Plant is land-applied in accordance with the Nutrient Management Act 2002 and Ontario Regulation 267/03.

Grab samples of digested (aerobic) sludge are collected and tested as per these guidelines. In 2019, sludge sample analyses was carried out by SGS Lakefield Research Limited. A summary of sludge sample results is provided in Appendix B.

A total volume of 0 m<sup>3</sup> was hauled from the Arthur WWTP to the Mount Forest Sludge Storage Facility in 2019.

Wessuc Environmental Services Inc. was contracted to haul and spread sludge from the Mount Forest plant in 2019. (Certificate of Approval - Waste Management System #1603-4LGJBN)

Based on the design flow, average wastewater quality, and a linear regression with an  $R^2$  value of 69.63%, the anticipated volume to be generated in the next reporting period is approximately 4,039.6 m<sup>3</sup>.

The following certified sites were utilized in 2019

 Table 14.
 Volume of Sludge Generated from Mount Forest Wastewater Treatment Plant in 2019

Site	Site Location	Volume of Biosolids (m <sup>3</sup> )	Hauler
NASM Submission ID: 23570	W1006	3262.5	Wessuc

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Figure 1. Mount Forest Wastewater Treatment Plant Haulage Volumes (2010 to 2019)

#### 9. Complaints

As per 10.(5)(h) of C of A 6134-73FHHU, a summary of any complaints received during the reporting period and any steps taken to address the complaints is required.

A standard operating procedure (SOP) is in place for addressing complaints received from the community. All complaints are addressed and documented in the facility logbook. Community complaint information is entered in OCWA's electronic database system "OPEX". This system contains all the required information and history of all complaints.

There were no complaints registered during the reporting period.

#### 10. By-pass, Spill or Abnormal Discharge Events

As per 10.(5)(i) of C of A 6134-73FHHU, a summary of all By-pass, spill or abnormal discharge events is required.

There was no by-pass, spills or abnormal discharge events that occurred during the reporting period.

#### **11.** Additional Information

As per 10.(5)(j) of C of A 6134-73FHHU, any other information the Direct Manager requires from time to time is required.

There were no requests from the District Manager for any other information during the reporting period.

2019 Annual Performance Report Mount Forest Wastewater Treatment Plant Certificate of Approval No. 6134-73F3FHHU

## Appendix A

## Performance Assessment Report

Ontario Clean Water Agency Performance Assessment Report Wastewater/Lagoon

Report extracted 03/17/2020 09:39

Facility: [5541] MOUNT FOREST WASTEWATER TREATMENT FACILITY

Works:	[120001381]
	[120001001]

From: 01/01/2019 to 31/12/2019

	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019		07/2019		08/2019		09/2019		10/2019		11/2019		12/2019	<	-Total>	<avç< th=""><th>g&gt;</th><th><max></max></th><th><criteria></criteria></th></avç<>	g>	<max></max>	<criteria></criteria>
Flows:																								
Raw Flow: Total - Raw Sewage (m <sup>3</sup> )	62930.20	58717.20	84361.80	105219.40	75806.00	50675.30		41884.50		38095.20		36046.40		41535.50		56975.80		62168.00	71	4415.30				
Raw Flow: Avg - Raw Sewage (m <sup>3</sup> /d)	2030.01	2097.04	2721.35	3507.31	2445.35	1689.18		1351.11		1228.88		1201.55		1339.85		1899.19		2005.42			1959	.69		2818.00000000000000000000000000000000000
Raw Flow: Max - Raw Sewage (m <sup>3</sup> /d)	3353.40	4033.80	6348.40	5890.60	3563.90	2032.30		1562.70		1488.50		1380.70		2840.80		2603.20		3287.10					6348.40	
Eff. Flow: Total - Final Effluent (m <sup>3</sup> )	69920.60	65269.70	88440.20	110748.20	83992.60	59355.90		50598.40		46412.80		42362.60		36146.70		47748.30		50669.40	75	51665.40				
Eff. Flow: Avg - Final Effluent (m3/d)	2255.50	2331.06	2852.91	3691.61	2709.44	1978.53		1632.21		1497.19		1412.09		1166.02		1591.61		1634.50			2062	.72		
Eff. Flow: Max - Final Effluent (m3/d)	3684.00	4772.70	6763.50	6198.50	3752.10	2385.00		1929.80		1796.30		1869.90		2568.60		2305.30		2816.60					6763.50	
Carbonaceous Biochemical Oxygen Demand: CBOD:																								
Eff: Avg cBOD5 - Final Effluent (mg/L)	< 2.000	< 2.500	< 2.750 ·	< 2.400	2.500	< 2.250	<	3.200	<	2.000	<	2.250	<	2.000	<	2.000	<	2.000		<	2.32	21	3.200	12.5
Eff: # of samples of cBOD5 - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Loading: cBOD5 - Final Effluent (kg/d)	< 4.511	< 5.828	< 7.846 ·	< 8.860	6.774	< 4.452	<	5.223	<	2.994	<	3.177	<	2.332	<	3.183	<	3.269		<	4.87	71	8.860	
Biochemical Oxygen Demand: BOD5:																								
Raw: Avg BOD5 - Raw Sewage (mg/L)	83.600	57.250	61.250	69.000	34.500	72.750		138.400		116.000		74.250		103.800		95.500		72.200			81.5	i42	138.400	
Raw: # of samples of BOD5 - Raw Sewage (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Total Suspended Solids: TSS:																								
Raw: Avg TSS - Raw Sewage (mg/L)	61.600	53.500	51.250	40.000	41.500	57.250		107.200		127.250		64.000		62.400		108.000		71.400			70.4	46	127.250	
Raw: # of samples of TSS - Raw Sewage (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Eff: Avg TSS - Final Effluent (mg/L)	< 2.600	4.750	5.250	5.600	8.250	5.750	<	2.400	<	2.250	<	2.500	<	2.800		2.750		2.800		<	3.97	75	8.250	12.5
Eff: # of samples of TSS - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Loading: TSS - Final Effluent (kg/d)	< 5.864	11.073	14.978	20.673	22.353	11.377	<	3.917	<	3.369	<	3.530	<	3.265		4.377		4.577		<	9.11	13	22.353	
Percent Removal: TSS - Final Effluent (mg/L)	95.779	91.121	89.756	86.000	80.120	89.956		97.761		98.232		96.094		95.513		97.454		96.078					98.232	
Total Phosphorus: TP:																								
Raw: Avg TP - Raw Sewage (mg/L)	1.920	1.615	1.780	0.970	0.922	1.870		2.250		2.570		2.940		2.676		2.420		1.912			1.98	87	2.940	
Raw: # of samples of TP - Raw Sewage (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Eff: Avg TP - Final Effluent (mg/L)	0.158	0.100	0.093	0.112	0.140	0.125		0.068		0.088		0.095		0.068		0.140		0.216			0.11	17	0.216	0.37
Eff: # of samples of TP - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Loading: TP - Final Effluent (kg/d)	0.356	0.233	0.264	0.413	0.379	0.247		0.111		0.131		0.134		0.079		0.223		0.353			0.24	44	0.413	
Percent Removal: TP - Final Effluent (mg/L)	91.771	93.808	94.803	88.454	84.824	93.316		96.978		96.595		96.769		97.459		94.215		88.703					97.459	
Nitrogen Series:																								
Raw: Avg TKN - Raw Sewage (mg/L)	19.940	16.150	15.250	10.040	10.100	20.150		26.880		29.775		32.925		32.120		24.125		22.640			21.6	575	32.925	
Raw: # of samples of TKN - Raw Sewage (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Eff: Avg TAN - Final Effluent (mg/L)	< 0.100	< 0.575	< 0.150 ·	< 0.100	< 0.100	< 0.100	<	0.140	<	0.150		0.450	<	0.100	<	0.125	<	0.100		<	0.18	83	0.575	- 2.5 - 2.5 - 2.5 - 2.
Eff: # of samples of TAN - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Loading: TAN - Final Effluent (kg/d)	< 0.226	< 1.340	< 0.428 ·	< 0.369 ·	< 0.271	< 0.198	<	0.229	<	0.225		0.635	<	0.117	<	0.199	<	0.163		<	0.36	67	1.340	
Eff: Avg NO3-N - Final Effluent (mg/L)	17.960	17.175	14.825	12.140	14.475	18.125		26.760		31.450		30.600		24.700		21.000		20.580			20.8	16	31.450	
Eff: # of samples of NO3-N - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Eff: Avg NO2-N - Final Effluent (mg/L)	< 0.032	0.202	0.148 ·	< 0.058	0.080	0.063	<	0.044		0.053	<	0.175	<	0.038	<	0.030	<	0.030		<	0.07	79	0.202	
Eff: # of samples of NO2-N - Final Effluent (mg/L)	5	4	4	5	4	4		5		4		4		5		4		5		53				
Disinfection:																								
Eff: GMD E. Coli - Final Effluent (cfu/100mL)	1.516	3.722	2.000	3.288	10.954	6.055		4.000		2.736		2.000		14.519		2.378		2.491			4.63	38	14.519	200.0
Eff: # of samples of E. Coli - Final Effluent (cfu/100mL)	5	4	4	5	4	4		5		4		4		5		4		5		53				

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## Appendix B

### Sludge Haulage Summary & Sludge Quality Analysis

Mount Forest WWTP - Daily Haulage Summary										
Date	Site	NASM #	Sludge Hauled (m <sup>3</sup> )							
October										
10/09/2019	W1006	23570	1,260.0							
10/10/2019	W1006	23570	1112.5							
10/11/2019	W1006	23570	890.0							
		Total	3,262.5							

#### MOUNT FOREST WASTEWATER TREATMENT PLANT SLUDGE QUALITY DATA

#### 

(mg/kg)

Zinc [4200]

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC	AVERAGE	
<u>Nutrients</u>															
TS	(mg/L)	36800	22800	25400	15100	16100	25600	29100	10900	27000	19100	13400	12100	21117	
Ammonia+Ammonium	(mg/L)	27.0	8.8	4.8	1	2.8	240	454.0	3.4	316.0	10.8	1.8	1.9	89.4	
Nitrate	(mg/L)	4.30	0.50	0.40	1.10	1.40	0.30	0.30	190.00	0.30	0.40	36.00	2.10	19.76	
Ammonia + Nitrate	(mg/L)	31.3	9.3	5.2	2.1	4.2	240.3	454.3	193.4	316.3	11.2	37.8	4.0	109.1	
TKN	(mg/L)	1700	950	1070	614	592	1690	1560	302	1080	736	316	520	928	
Phosphorus	(mg/L)	1300	690	940	420	470	790	760	220	780	600	590	450	668	
Metal Concentrations															
Arsenic	(mg/L)	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	
Cadmium	(mg/L)	0.022	0.011	0.015	0.007	0.008	0.014	0.012	0.008	0.013	0.010	0.008	0.006	0.01	
Cobalt	(mg/L)	0.08	0.04	0.06	0.02	0.030	0.05	0.04	0.01	0.05	0.03	0.03	0.02	0.04	
Chromium	(mg/L)	0.76	0.42	0.60	0.22	0.24	0.48	0.48	0.13	0.48	0.32	0.30	0.23	0.39	
Copper	(mg/L)	16.00	9.30	12.00	5.20	6.10	12.00	11.00	3.00	11.00	8.20	7.10	6.10	8.92	
Mercury	(mg/L)	0.023	0.015	0.020	0.009	0.0130	0.0180	0.017	0.010	0.0140	0.038	0.025	0.017	0.018	
Potassium	(mg/L)	93	66.0	79.0	48.0	47.0	100.0	95.0	56.0	79.0	48.0	52.0	52.0	68	
Molybdenum	(mg/L)	0.21	0.11	0.13	0.08	0.08	0.16	0.16	0.08	0.16	0.16	0.18	0.11	0.14	
Nickel	(mg/L)	0.63	0.37	0.51	0.21	0.22	0.48	0.46	0.12	0.41	0.31	0.28	0.27	0.36	
Lead	(mg/L)	0.70	0.04	0.50	0.20	0.20	0.40	0.30	0.10	0.40	0.30	0.30	0.20	0.30	
Selenium	(mg/L)	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	
Zinc	(mg/L)	21.00	11.00	15.00	6.30	7.30	13.00	11.00	3.30	13.00	8.60	8.10	6.60	10.35	
<u>Bacti</u>															
E. coli (cfu/1g dried wgt	)	144,022	416,667	125,984	37,086	15,528	546,875	75,000	19,266	3,333	3,141	5,970	181,818	131,224	< 2,000,000 cfu
E. coli (cfu/100mL)		530,000	950,000	320,000	56,000	25,000	140,000	210,000	21,000	9,000	6,000	8,000	220,000	207,917	< 2,000,000 cfu
Metal/Solids Concentra	<u>ition</u>												_		
Arsenic [170]	(mg/kg)	5	4	4	7	6	4	3	9	4	5	7	8	6	(Max. 170)
Cadmium [34]	(mg/kg)	1	0	1	0	0	1	0	1	0	1	1	0	1	(Max. 34)
Cobalt [340]	(mg/kg)	2	2	2	1	2	2	1	1	2	2	2	2	2	(Max. 340)
Chromium [2800]	(mg/kg)	21	18	24	15	15	19	16	12	18	17	22	19	18	(Max. 2800)
Copper [1700]	(mg/kg)	435	408	472	344	379	469	378	275	407	429	530	504	419	(Max. 1700)
Mercury [11]	(mg/kg)	1	1	1	1	1	1	1	1	1	2	2	1	1	(Max. 11)
Molybdenum [94]	(mg/kg)	6	5	5	5	5	6	5	7	6	8	13	9	7	(Max. 94)
Nickel [420]	(mg/kg)	17	16	20	14	14	19	16	11	15	16	21	22	17	(Max. 420)
Lead [1100]	(mg/kg)	19	2	20	13	12	16	10	9	15	16	22	17	14	(Max. 1100)
Selenium [34]	(mg/kg)	5	4	4	7	6	4	3	9	4	5	7	8	6	(Max. 34)

482 (Max. 4200)

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Appendix C

**Calibration Reports** 



# FLOW, PRESSURE and LEVEL INSTRUMENTATION Verification / Calibration REPORT

OCWA West Highlands Hub Shelburne

September 2019



October 15, 2019

OCWA – West Highlands Hub - Shelburne David Jorge Process Compliance Technician Shelburne, Ontario LON 1J0 T: 519-925-1938 ext 225 C: 519-938-6909 E: djorge@ocwa.com

#### RE: OCWA – West Highlands Hub - Shelburne September 13,16-20, 23-24, 2019

Dear Mr. Jorge,

SCG Flowmetrix appreciates the opportunity to complete your instrument verification/calibration services. This letter of transmittal confirms completion of this service project.

The following service report contains the individual instrument reports for all verification/calibrations as well as an Equipment List Summary.

Note: Equipment List Summary is only included where 5 or more instruments are verified/calibrated for the same client/area. Otherwise, only individual reports are provided.

In addition to the base report, relevant information related to standard approach and methodologies for various instruments verified and/or calibrated, and a statement of qualifications for all verification/calibrations completed by trained, knowledgeable and experienced personnel is found in the section <u>Quality Assurance and</u> <u>Quality Control</u>.

If you have any additional questions or concerns with regards to this report, please do not hesitate to contact me directly.

Kind Regards,

Jeremy Stevens *Technical Services Manager* #3, 15 Connie Crescent Concord, ON L4K 1L3 c. 416-427-8483 jstevens@flowmetrix.ca



#### **Quality Assurance / Quality Control**

Flowmetrix adheres to a rigid scope of service and deliverables for each client and instrument verified, calibrated and reported. We follow a standard guideline while performing verification and calibration procedures for each instrument; using original equipment manufacturer (OEM) tools, where possible. The values are field reported and entered into a standard report format for client review. A digital report is completed for each instrument and collated into a single document for client record.

#### Approach & Methodology

Flowmetrix conducts verification of each instrument and subsequent calibrations on instruments that are outside the expected tolerance of the instrument response, where possible. Manufacturers OEM suggested testing guidelines are used to verify and/or calibrate each instrument. Where, unable to perform the verification or calibration as suggested by the manufacturer, a best management practice is performed to validate the performance of such instruments.

#### REPORTING

Flowmetrix report is divided into (2) sections. <u>Section (i)</u> identifies an equipment summary of all instruments verified during this service project including instruments that PASS or FAIL; <u>section (ii)</u> identifies individual equipment reports for client review and record and identifies any comments and deficiencies that should be noted for client review and possible response.

#### Section (i) - Equipment Summary

An equipment summary sheet identifying all instruments; both PASSING and FAILING verification and/or calibration while completed during this service project.

The Summary Equipment List is only included where 5 or more instruments are verified/calibrated for the same client/area. Otherwise, only individual reports are provided.

#### Section (ii) - Individual Equipment Reports

Individual equipment reports are completed for easy review and are found in Appendix B. These reports outline all specific information pertaining to the equipment be tested; noted as meter under test (MUT). Date, time, location, meter make, model and serial number accompany this report for tracking and identification. Each report identifies a PASS or FAIL comment 'as found' and 'as left' upon completion of the verification and/or calibration.

Where possible, a verification is performed prior to calibration, if the OEM testing procedures allow, otherwise an 'as left' report is provided for such equipment.

# Note: If a meter under test (MUT) is (AS FOUND) to be operating outside of the allowable tolerance, the report will indicate "NA". The "NA" statement is NOT suggesting the MUT, or a component of the MUT is not functional or has failed; but simply indicates at the time the test was conducted the verification reported values are found outside the allowable tolerance.

### Only if the MUT is failed due to equipment failure and not verification/calibration tolerances, the report will indicate "FAIL" (AS FOUND) and will be commented on in the individual equipment report.

#### STATEMENT OF QUALIFICATIONS

To comply with our clients DWQMS standards, Flowmetrix adheres to a rigid approach to conducting our equipment verification/calibration services including the training received by our company and our personnel conducting service. A Statement of Qualifications outlining Flowmetrix qualifications to conduct this level of service is available in a separate document upon request.

#### FORWARD FLOW DIRECTION

#### PASS

yes

CLIENT DETAI	L			EQUIPMENT DETAIL
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	Krohne
CONTACT	David Jorge		MODEL	IFC010D
	Process Compliance Technic	an	SERIAL NUMBER	C08 0284
	p: 519-925-1938 x 225		FUSE	Pull plug on Board
	c: 519-938-6909			
	e: djorge@ocwa.com		PLANT ID	Mounut Forest WWTP
			METER ID	RAS Pump 1 Flow
			FIT ID	FIT-101
			CLIENT TAG	n/a
			OTHER	OCWA# 205520
VER. BY - FM	Paris Machuk		GPS COORDINATES	N 43 58.111 W080 44.729
Quality Manag	gement Standards Informatio	n -		
Reference eq	uipment and instrumentation	used to	VERIFICATION DATE	September 20, 2019
conduct this v	erification test is found in our	AC-QMS	CAL. FREQUENCY	Annual
document at t	ne time this test was conduc	lea.	CAL. DUE DATE	September, 2020
PROGRAMMIN	G PARAMETERS		FORW	ARD TOTALIZER INFORMATION
DIAMETER (DN	l) mm	100	AS FOUND	2504981 M3
F.S. FLOW - MA	AG LPS	66.3	AS LEFT	2504989 M3
F.S. RANGE - C	)/P LPS	50.000	DIFFERENCE	8 M3
CAL. k-FACTOF	R GKL	5.53540		TEST CRITERIA
			AS FOUND CERTIFICATION	N TEST Yes
			FORWARD FLOW DIRECTI	ON Yes
			ALLOWABLE [%] ERROR	5
				COMPONENTS TESTED
			CONVERTER DISPLAY	Ves
			mA OUTPUT	ves
			TOTALIZER	Yes

#### FLOW TUBE SIMULATION

Zero Offset Flow

CG

**FLOWMETRIX** 

LPS

0.0100

			Г	0.0	0.5	1.0	2.0	5.0	m/s
			-	0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.0	6.6	13.3	26.5	66.3	% F.S. Range
REF. FLOW RATE				0.01	3.32	6.64	13.26	33.14	LPS
MUT [Reading]				0.01	3.32	6.63	13.27	33.14	LPS
MUT [Difference]				0.00	0.00	-0.01	0.01	0.00	LPS
MUT [% Error]				0.00	-0.08	-0.08	0.07	0.01	%
mA OUTPUT				4.000	5.063	6.123	8.244	14.604	mA
MUT [Reading]	min.	4.000	mA	3.992	5.054	6.112	8.247	14.597	mA
MUT [Difference]	max.	20.000	mA	-0.008	-0.009	-0.011	0.003	-0.007	mA
MUT [% Error]				-0.20	-0.18	-0.19	0.04	-0.05	%
TOTALIZER - REF. FLOW	RATE							33.138	LPS
TOTALIZER [MUT]								5	M3
TEST TIME								150.26	SECONDS
CALC. TOTALIZER								4.979	M3
ERROR								0.41	%

ACCURACY BASED ON [% o.r.]

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

#### COMMENTS

QUALITY MANAGEM	IENT STANDA	RDS INFO.	RES	SULTS		
[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	
[REFERENCE] FTS	KRO	1	TEST	% o.r.	FAIL	
PROCESS METER	PM	11	DISPLAY	-0.02	PASS	
ANALOG METER	AM	N/A	mA OUTPUT	-0.12	PASS	
STOP WATCH	SW	Yes	TOTALIZER	0.41	PASS	

#### FORWARD FLOW DIRECTION

#### PASS

Yes

yes

CLIENT DETAIL	L			EQUIPMENT DE	ETAIL
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	K	rohne
CONTACT	David Jorge		MODEL	IFC	010D
	Process Compliance Technicia	an	SERIAL NUMBER	C08	0272
	p: 519-925-1938 x 225		FUSE	Pull Plug on I	Board
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Mounut Forest W	VWTP
			METER ID	RAS Pump 2	2 Flow
			FIT ID	FI	T-102
			CLIENT TAG		n/a
			OTHER	OCWA# 20	05521
VER. BY - FM	Paris Machuk		GPS COORDINATES	N 43 58.111 W080 4	4.729
Quality Manag	gement Standards Information	า -			
Reference eq	uipment and instrumentation	used to	VERIFICATION DATE	September 20,	, 2019
conduct this v	erification test is found in our	AC-QMS	CAL. FREQUENCY	A	nnual
document at t	he time this test was conduct	eu.	CAL. DUE DATE	September,	, 2020
PROGRAMMIN	G PARAMETERS		FORWA	RD TOTALIZER INFORMA	
DIAMETER (DN	l) mm	100	AS FOUND	3244340	М3
F.S. FLOW - MA	AG LPS	65.8	AS LEFT	3244345	М3
F.S. RANGE - C	D/P LPS	50.000	DIFFERENCE	5	М3
CAL. k-FACTOF	R GKL	5.49750		TEST CRIT	ERIA
			AS FOUND CERTIFICATION	TEST	Yes
			FORWARD FLOW DIRECTION	NC	Yes
			ALLOWABLE [%] ERROR		5
				COMPONENTS TE	STED
			CONVERTER DISPLAY		ves
			mA OUTPUT		ves

#### FLOW TUBE SIMULATION

Zero Offset Flow

<u>C</u><u>G</u>

**FLOWMETRIX** 

LPS

0.0000

				0.0	0.5	1.0	2.0	5.0	m/s
				0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.0	6.6	13.2	26.3	65.8	% F.S. Range
REF. FLOW RATE				0.000	3.290	6.580	13.160	32.901	LPS
MUT [Reading]				0.000	3.340	6.670	13.190	32.940	LPS
MUT [Difference]				0.000	0.050	0.090	0.030	0.039	LPS
MUT [% Error]				n/a	1.52	1.36	0.22	0.12	%
mA OUTPUT				4.000	5.053	6.106	8.211	14.528	mA
MUT [Reading]	min.	4.000	mA	4.001	5.054	6.128	8.221	14.535	mA
MUT [Difference]	max.	20.000	mA	0.001	0.001	0.022	0.010	0.007	mA
MUT [% Error]				0.03	0.02	0.37	0.12	0.05	%
TOTALIZER - REF. FLOW	RATE							32.901	LPS
TOTALIZER [MUT]								4	M3
TEST TIME								121.20	SECONDS
CALC. TOTALIZER								3.988	M3
ERROR								0.31	%

TOTALIZER

ACCURACY BASED ON [% o.r.]

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

#### COMMENTS

MIMEN 13		IENT STANDA	RDS INFO.	RE	SULTS		
	[QMS] INFORMATION	IDENT.	ID #	тгот	AVG	PASS	
	[REFERENCE] FTS	KRO	1	IESI	% o.r.	FAIL	
	PROCESS METER	PM	11	DISPLAY	0.81	PASS	
	ANALOG METER	AM	N/A	mA OUTPUT	0.12	PASS	
	STOP WATCH	SW	Yes	TOTALIZER	0.31	PASS	

#### FORWARD FLOW DIRECTION

#### PASS

yes

CLIENT DETAIL	L			EQUIPMENT DETAIL
CUSTOMER	OCWA - West Highlands Hu	ıb	[MUT] MANUFACTURER	Krohne
CONTACT	David Jorge		MODEL	IFC010D
	Process Compliance Techn	cian	SERIAL NUMBER	C08 0308
	p: 519-925-1938 x 225		FUSE	Pull Plug On Board
	c: 519-938-6909			
	e: djorge@ocwa.com		PLANT ID	Mounut Forest WWTP
			METER ID	WAS/SCUM Flow
			FIT ID	FIT-103
			CLIENT TAG	n/a
			OTHER	OCWA# 205522
VER. BY - FM	Paris Machuk		GPS COORDINATES	N 43 58.111 W080 44.729
Quality Manao	pement Standards Informat	ion -		
Reference eq	uipment and instrumentation	n used to	VERIFICATION DATE	September 20, 2019
conduct this v	erification test is found in o	ur AC-QMS	CAL. FREQUENCY	Annual
document at t	he time this test was condu	cted.	CAL. DUE DATE	September, 2020
PROGRAMMIN	G PARAMETERS		FORW	ARD TOTALIZER INFORMATION
DIAMETER (DN	l) mm	80	AS FOUND	133715 <b>M3</b>
F.S. FLOW - MA	AG LPS	41.2	AS LEFT	133719 <b>M3</b>
F.S. RANGE - C	D/P LPS	30.000	DIFFERENCE	4 M3
CAL. k-FACTOF	R GKL	5.37250		TEST CRITERIA
			AS FOUND CERTIFICATION	N TEST Yes
			FORWARD FLOW DIRECTION	ON Yes
			ALLOWABLE [%] ERROR	5
				COMPONENTS TESTED
			CONVERTER DISPLAY	Ves
			mA OUTPUT	ves
			TOTALIZER	Yes

#### FLOW TUBE SIMULATION

Zero Offset Flow

<u>C</u><u>G</u>

**FLOWMETRIX** 

LPS

0.0100

LOW LODE ONIOLAIN									
				0.0	0.5	1.0	2.0	5.0	m/s
				0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.0	6.9	13.8	27.5	68.6	% F.S. Range
REF. FLOW RATE				0.010	2.068	4.126	8.241	20.588	LPS
MUT [Reading]				0.010	2.080	4.121	8.246	20.594	LPS
MUT [Difference]				0.000	0.012	-0.005	0.005	0.006	LPS
MUT [% Error]				0.00	0.59	-0.11	0.06	0.03	%
mA OUTPUT				4.000	5.103	6.200	8.395	14.980	mA
MUT [Reading]	min.	4.000	mA	3.996	5.104	6.197	8.394	14.985	mA
MUT [Difference]	max.	20.000	mA	-0.004	0.001	-0.003	-0.001	0.005	mA
MUT [% Error]				-0.10	0.02	-0.05	-0.02	0.03	%
TOTALIZER - REF. FLO	<b>W RATE</b>							20.588	LPS
TOTALIZER [MUT]								2	M3
TEST TIME								97.37	SECONDS
CALC. TOTALIZER								2.005	M3
ERROR								-0.23	%
·									

ACCURACY BASED ON [% o.r.]

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

#### COMMENTS

VIVIEN I S	QUALITY MANAGEN	IENT STANDA	RDS INFO.	RES	SULTS		
	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	Ĺ
	[REFERENCE] FTS	KRO	1	IESI	% o.r.	FAIL	
	PROCESS METER	PM	11	DISPLAY	0.14	PASS	ĺ
	ANALOG METER	AM	N/A	mA OUTPUT	-0.02	PASS	
	STOP WATCH	SW	Yes	TOTALIZER	-0.23	PASS	
							L

#### FORWARD FLOW DIRECTION

#### PASS

	-			EQUIPMENT	DETAIL
CUSTOMER	OCWA - West Highlands	Hub	[MUT] MANUFACTURER		Krohne
CONTACT	David Jorge		MODEL	I	FC090D
	Process Compliance Tecl	nnician	SERIAL NUMBER	C	08 1357
	p: 519-925-1938 x 225		FUSE	Pull Plug o	on Board
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Mounut Fores	t WWTP
			METER ID	Septage Receiv	ing Flow
			FIT ID		n/a
			CLIENT TAG		n/a
			OTHER	OCWA#	205514
VER. BY - FM	Paris Machuk		GPS COORDINATES N 4	43 58.111 W08	0 44.729
Quality Manag	ement Standards Inform	ation -			
Reference equ	ipment and instrumenta	tion used to	VERIFICATION DATE	September 2	20, 2019
conduct this ve	erification test is found in	our AC-QMS	CAL. FREQUENCY		Annual
uocument at ti		uucleu.	CAL. DUE DATE	Septemb	er, 2020
PROGRAMMIN	G PARAMETERS		FORWARD T	OTALIZER INFOR	MATION
PROGRAMMIN DIAMETER (DN	G PARAMETERS	<b>n</b> 100	FORWARD TO AS FOUND	OTALIZER INFOR 45475587	MATION LITER
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA	G PARAMETERS ) mr .G LP3	n 100 S 65.9	FORWARD T AS FOUND AS LEFT	OTALIZER INFOR 45475587 45481634	MATION LITER LITER
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O	G PARAMETERS ) mr G LP: /P LP:	n 100 S 65.9 S 40.000	FORWARD T AS FOUND AS LEFT DIFFERENCE	OTALIZER INFOR 45475587 45481634 6047	MATION LITER LITER LITER
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS           )         mr           G         LP:           /P         LP:           K         G	n 100 S 65.9 S 40.000 K 2.75380	FORWARD T AS FOUND AS LEFT DIFFERENCE	OTALIZER INFOR 45475587 45481634 6047 TEST CI	MATION LITER LITER LITER RITERIA
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST	OTALIZER INFOR 45475587 45481634 6047 TEST CI	MATION LITER LITER LITER RITERIA Yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION	OTALIZER INFOR 45475587 45481634 6047 TEST CI	MATION LITER LITER LITER RITERIA Yes Yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR	OTALIZER INFOR 45475587 45481634 6047 TEST CI	MATION LITER LITER LITER RITERIA Yes Yes 5
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MATION LITER LITER LITER RITERIA Yes Yes 5 TESTED
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR CONVERTER DISPLAY	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MATION LITER LITER LITER RITERIA Yes Yes 5 TESTED yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR CONVERTER DISPLAY mA OUTPUT	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MATION LITER LITER LITER RITERIA Yes 5 TESTED yes yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR CONVERTER DISPLAY mA OUTPUT TOTALIZER	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MATION LITER LITER LITER RITERIA Yes 5 TESTED yes yes Yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR CONVERTER DISPLAY mA OUTPUT TOTALIZER ACCURACY BASED ON [% o.r.]	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MATION LITER LITER LITER RITERIA Yes Yes 5 TESTED yes yes Yes yes
PROGRAMMIN DIAMETER (DN F.S. FLOW - MA F.S. RANGE - O CAL. k-FACTOR	G PARAMETERS ) mr G LP: /P LP: C G	n 100 5 65.9 5 40.000 K 2.75380	FORWARD TO AS FOUND AS LEFT DIFFERENCE AS FOUND CERTIFICATION TEST FORWARD FLOW DIRECTION ALLOWABLE [%] ERROR CONVERTER DISPLAY mA OUTPUT TOTALIZER ACCURACY BASED ON [% o.r.]	OTALIZER INFOR 45475587 45481634 6047 TEST CI COMPONENTS	MAT LI LI RITE

#### FLOW TUBE SIMULATION

SCG

**FLOWMETRIX** 

			Γ	0.0	0.5	1.0	2.0	5.0	m/s
				0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.0	8.2	16.5	33.0	82.4	% F.S. Range
REF. FLOW RATE				0.00	3.30	6.59	13.18	32.96	LPS
MUT [Reading]				0.00	3.30	6.59	13.16	32.89	LPS
MUT [Difference]				0.00	0.00	0.00	-0.02	-0.07	LPS
MUT [% Error]				n/a	0.12	-0.03	-0.19	-0.22	%
mA OUTPUT				4.000	5.318	6.637	9.274	17.185	mA
MUT [Reading]	min.	4.000	mA	3.997	5.321	6.637	9.267	17.151	mA
MUT [Difference]	max.	20.000	mA	-0.003	0.003	0.000	-0.007	-0.034	mA
MUT [% Error]				-0.08	0.05	0.00	-0.07	-0.20	%
TOTALIZER - REF. FLOW	/ RATE							32.961	LPS
TOTALIZER [MUT]								2869	LITER
TEST TIME								87.19	SECONDS
CALC. TOTALIZER								2873.912	LITER
ERROR								-0.17	%

#### COMMENTS

JMMENTS	QUALITY MANAGEM	ENT STANDAR	RDS INFO.	RE	BULTS		
	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	l
	[REFERENCE] FTS	KRO	1	TEST	% o.r.	FAIL	l
	PROCESS METER	PM	11	DISPLAY	-0.08	PASS	l
	ANALOG METER	AM	N/A	mA OUTPUT	-0.06	PASS	l
	STOP WATCH	SW	Yes	TOTALIZER	-0.17	PASS	l
							L

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.

#### FORWARD FLOW DIRECTION

#### PASS

CLIENT DETAI	_				EQUIPMENT	DETAIL
CUSTOMER	OCWA - West Highland	ds Hub		[MUT] MANUFACTURER		Krohne
CONTACT	David Jorge			MODEL	IF	FC020D
	Process Compliance To	echnicia	n	SERIAL NUMBER	(	0429/03
	p: 519-925-1938 x 225			FUSE	Pull Plug o	n Board
	c: 519-938-6909					
	e: djorge@ocwa.com			PLANT ID	Mounut Forest	WWTP
				METER ID	Sludge Receivi	ng Flow
				FIT ID		n/a
				CLIENT TAG		n/a
				OTHER	OCWA#	205524
VER. BY - FM	Paris Machuk			GPS COORDINATES	N 43 58.111 W080	) 44.729
Quality Manag	gement Standards Info	rmation	-			
Reference eq	upment and instrumen	tation ι	ised to	VERIFICATION DATE	September 2	20, 2019
conduct this v	erification test is found	In our l	AC-QMS	CAL. FREQUENCY		Annual
uocument at t		Jinuucie		CAL. DUE DATE	Septembe	er, 2020
PROGRAMMIN	G PARAMETERS			FORWA		MATION
DIAMETER (DN	1)	mm	150	AS FOUND	157136	М3
F.S. FLOW - MA	۱G L	PS	174.5	AS LEFT	157150	М3
F.S. RANGE - C	I/P L	PS	100.000	DIFFERENCE	14	М3
CAL. k-FACTOF	R	GK	3.24000		TEST CR	ITERIA
				AS FOUND CERTIFICATION	TEST	Yes
				FORWARD FLOW DIRECTION	ON	Yes
				ALLOWABLE [%] ERROR		5
					COMPONENTS T	ESTED
				CONVERTER DISPLAY		yes
				mA OUTPUT		yes
				TOTALIZER		Yes
				ACCURACY BASED ON [% (	o.r.]	yes
Zero Offset Flow	v l	PS	0.0000	ERROR DOCUMENTED IN	THIS REPORT; BASED ON 9	% o.r.

#### FLOW TUBE SIMULATION

SCG

**FLOWMETRIX** 

			[	0.0	0.5	1.0	2.0	5.0	m/s
				0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.0	8.7	17.5	34.9	87.3	% F.S. Range
REF. FLOW RATE				0.00	8.73	17.45	34.90	87.26	LPS
MUT [Reading]				0.00	8.71	17.45	34.89	87.27	LPS
MUT [Difference]				0.00	-0.02	0.00	-0.01	0.01	LPS
MUT [% Error]				n/a	-0.18	-0.01	-0.04	0.01	%
mA OUTPUT				4.000	5.396	6.792	9.584	17.961	mA
MUT [Reading]	min.	4.000	mA	4.000	5.392	6.795	9.587	17.959	mA
MUT [Difference]	max.	20.000	mA	0.000	-0.004	0.003	0.003	-0.002	mA
MUT [% Error]				0.00	-0.08	0.04	0.03	-0.01	%
TOTALIZER - REF. FLOW	RATE							87.257	LPS
TOTALIZER [MUT]								9	M3
TEST TIME								103.28	SECONDS
CALC. TOTALIZER								9.012	M3
ERROR								-0.13	%

#### COMMENTS

SMMENTS	QUALITY MANAGEM	ENT STANDA	RDS INFO.	RE	BULTS		
	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	ĺ
	[REFERENCE] FTS	KRO	1	TEST	% o.r.	FAIL	l
	PROCESS METER	PM	11	DISPLAY	-0.05	PASS	ĺ
	ANALOG METER	AM	N/A	mA OUTPUT	0.00	PASS	l
	STOP WATCH	SW	Yes	TOTALIZER	-0.13	PASS	Ĺ
							L

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.

#### FORWARD FLOW DIRECTION

#### PASS

CLIENT DETAIL	L			EQUIPMENT [	DETAIL
CUSTOMER	OCWA - West Highlands Hu	b	[MUT] MANUFACTURER		Krohne
CONTACT	David Jorge		MODEL	IF	-C020D
	Process Compliance Techni	cian	SERIAL NUMBER	С	)427/03
	p: 519-925-1938 x 225		FUSE	Pull Plug or	n Board
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Mount Forest	WWTP
			METER ID	Sludge Loadir	ng Flow
			FIT ID		n/a
			CLIENT TAG		n/a
			OTHER	OCWA# :	205525
VER. BY - FM	Paris Machuk		GPS COORDINATES N43	58.111 W080	44.729
Quality Manag	gement Standards Informat	ion -			
Reference eq	uipment and instrumentatio	n used to	VERIFICATION DATE	September 20	0, 2019
conduct this v	erification test is found in o	Jr AC-QMS	CAL. FREQUENCY		Annual
uocument at t		cieu.	CAL. DUE DATE	Septembe	er, 2020
PROGRAMMIN	G PARAMETERS		FORWARD TOT		ATION
DIAMETER (DN	l) mm	100	AS FOUND	273075	М3
F.S. FLOW - MA	AG LPS	61.9	AS LEFT	273088	М3
F.S. RANGE - C	)/P LPS	90.000	DIFFERENCE	13	М3
CAL. k-FACTOF	R GK	2.58700		TEST CR	ITERIA
			AS FOUND CERTIFICATION TEST		Yes
			FORWARD FLOW DIRECTION		Yes
			ALLOWABLE [%] ERROR		5
			C	OMPONENTS T	ESTED
			CONVERTER DISPLAY		yes
			mA OUTPUT		yes
			TOTALIZER		Yes
			ACCURACY BASED ON [% o.r.]		yes
Zero Offset Flow	v LPS	0.0000	ERROR DOCUMENTED IN THIS REP	ORT; BASED ON %	% o.r.

#### FLOW TUBE SIMULATION

SCG

**FLOWMETRIX** 

			Γ	0.0	1.0	2.0	5.0	10.0	m/s
				0.0	10.0	20.0	50.0	100.0	% F.S. Flow
				0.0	6.9	13.8	34.4	68.8	% F.S. Range
REF. FLOW RATE				0.00	6.19	12.39	30.96	61.93	LPS
MUT [Reading]				0.00	6.21	12.41	31.00	61.99	LPS
MUT [Difference]				0.00	0.02	0.02	0.04	0.06	LPS
MUT [% Error]				n/a	0.27	0.19	0.11	0.10	%
mA OUTPUT				4.000	5.101	6.202	9.505	15.010	mA
MUT [Reading]	min.	4.000	mA	3.997	5.097	6.203	9.508	15.016	mA
MUT [Difference]	max.	20.000	mA	-0.003	-0.004	0.001	0.003	0.006	mA
MUT [% Error]				-0.08	-0.08	0.02	0.03	0.04	%
TOTALIZER - REF. FLOW	RATE							61.930	LPS
TOTALIZER [MUT]								8	M3
TEST TIME								129.10	SECONDS
CALC. TOTALIZER								7.995	M3
ERROR								0.06	%

#### COMMENTS

QUALITY MANAGEM	ENT STANDA	RDS INFO.	RES	SULTS		
[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	Ĺ
[REFERENCE] FTS	KRO	1	IESI	% o.r.	FAIL	
PROCESS METER	PM	11	DISPLAY	0.17	PASS	
ANALOG METER	AM	N/A	mA OUTPUT	-0.01	PASS	
STOP WATCH	SW	Yes	TOTALIZER	0.06	PASS	
						Ĺ

#### PASS

CLIENT DETAI	L				EQUIPMENT D	ETAIL
CUSTOMER	OCWA - West Highlar	nds Hub		[MUT] MANUFACTURER	Millt	ronics
CONTACT	David Jorge			MODEL	MultiRange	er 200
	Process Compliance	Technician		CONVERTER SERIAL NU	MBER PBD/V71	00076
	p: 519-925-1938 x 22	5				
	c: 519-938-6909					
	e: djorge@ocwa.com			PLANT ID	Mount Forest V	VWTP
				METER ID	Influen	t Flow
				FIT ID	LI	IT-001
				CLIENT TAG	OCWA# 2	05513
				OTHER		n/a
VER. BY - FM	Paris Machuk			GPS COORDINATES	N43 538.111 W080 4	14.729
Quality Mana	gement Standards Info	ormation -				
Reference eq	uipment and instrume	ntation used to		VERIFICATION DATE	September 20	, 2019
conduct this v	erification test is foun	d in our AC-QMS		CAL. FREQUENCY	A	۱nnual
document at t	the time this test was o	conducted.		CAL. DUE DATE	September	, 2020
					тоты	
		inches	0		002452.17	
		inches	9		903432.17	MO
	NCE	m	0.863		983522.86	IVI3
MAX. HEAD		m	0.600	DIFFERENCE	70.69	IVI3
DEAD ZONE		m	-0.037		IESICRI	
BLANKING DIS	SIANCE	m	0.300	AS FOUND CERTIFICATIO	DN TEST	Yes
MAX. FLOW		LPS	245.0	ALLOWABLE [%] ERROR		15
F.S. RANGE - C	)/P	LPS	245.0			
						OTEN.

#### COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	no
ERROR DOCUMENTED IN THIS REPORT; BA	ASED ON % F.S.

Ultrasonic Sensor is not installed high enough, to ensure full scale flow conditions

SCG

**FLOWMETRIX** 

#### AS FOUND TEST RESULTS

				18.6	34.6	53.8	75.7	87.5	% F.S. Range
			-	0.200	0.300	0.400	0.500	0.550	m
REF. FLOW RATE				45.630	84.854	131.774	185.397	214.503	LPS
MUT [Reading]				47.500	86.730	133.800	187.300	215.500	LPS
MUT [Difference]				1.870	1.876	2.026	1.903	0.997	LPS
MUT [% Error]				0.76	0.77	0.83	0.78	0.41	%
mA OUTPUT				6.979	9.540	12.604	16.105	18.006	mA
MUT [Reading]	min.	4.000	mA	7.068	9.650	12.727	16.216	18.056	mA
MUT [Difference]	max.	20.000	mA	0.089	0.110	0.123	0.111	0.050	mA
MUT [% Error]				0.44	0.55	0.62	0.55	0.25	%
TOTALIZER - REF. FLOW	/ RATE							214.503	LPS
TOTALIZER [MUT]								21.50	M3
TEST TIME								99.99	SECONDS
CALC. TOTALIZER								21.448	M3
ERROR								0.24	%

#### COMMENTS

JMMENIS	QUALITY MANAGEM	ENT STANDARDS	S INFO.	RES	ULTS	
	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS
	[REFERENCE] LEVEL	Sim. BOARD	Yes	TEST	%FS	FAIL
	PROCESS METER	PM	11	DISPLAY	0.69	PASS
	STOP WATCH	SW	Yes	mA OUTPUT	0.48	PASS
				TOTALIZER	0.24	PASS
					/	

#### AS LEFT CERTIFICATION

#### PASS

CLIENT DETAI	L				EQUIPMENT D	ETAIL
CUSTOMER	OCWA - West Highlan	nds Hub		[MUT] MANUFACTURER	Milli	tronics
CONTACT	David Jorge			MODEL	MultiRang	er 200
	Process Compliance	Technician		CONVERTER SERIAL NUM	MBER PBD/70	40026
	p: 519-925-1938 x 22	5				
	c: 519-938-6909					
	e: djorge@ocwa.com			PLANT ID	Mount Forest V	NWTP
				METER ID	Final Effluer	nt Flow
				FIT ID	L	IT-201
				CLIENT TAG	OCWA# 2	05504
				OTHER		n/a
VER. BY - FM	Paris Machuk			GPS COORDINATES	N43 538.111 W080 4	44.729
Quality Mana	gement Standards Info	ormation -				
Reference eq	uipment and instrume	ntation used to		VERIFICATION DATE	September 20	, 2019
conduct this v	erification test is found	d in our AC-QMS		CAL. FREQUENCY	A	Annual
document at t	he time this test was o	conducted.		CAL. DUE DATE	September	, 2020
PROCRAMMIN					τοτα	
		inches	9		783201 38	M3
		m	1 600	ASTEET	783331 44	M3
		m	0.600		120.06	1/13
		111 m	0.000	DIFFERENCE		
	TANOT		0.700		IESICRI	IERIA
BLAINKING DIS	IANCE	m	0.300		ILSI	INO 4 F
MAX. FLOW		LPS	245.0	ALLOWABLE [%] ERROR		15

#### COMPONENTS TESTED

yes
yes
yes
no

ERROR DOCUMENTED IN THIS REPORT; BASED ON % F.S.

#### AS FOUND TEST RESULTS

Ultrasonic sensor installed to ensure full scale flow condition

F.S. RANGE - O/P

<u>C</u>G

**FLOWMETRIX** 

LPS

245.0

				15.8	18.6	34.6	53.8	87.5	% F.S. Range
				0.180	0.200	0.300	0.400	0.550	m
REF. FLOW RATE				38.837	45.630	84.854	131.774	214.503	LPS
MUT [Reading]				38.690	45.680	84.420	130.500	210.200	LPS
MUT [Difference]				-0.147	0.050	-0.434	-1.274	-4.303	LPS
MUT [% Error]				-0.06	0.02	-0.18	-0.52	-1.76	%
mA OUTPUT				6.536	6.979	9.540	12.604	18.006	mA
MUT [Reading]	min.	4.000	mA	6.514	6.967	9.493	12.504	17.707	mA
MUT [Difference]	max.	20.000	mA	-0.022	-0.012	-0.047	-0.100	-0.299	mA
MUT [% Error]				-0.11	-0.06	-0.24	-0.50	-1.49	%
TOTALIZER - REF. FLC	W RATE							214.503	LPS
TOTALIZER [MUT]								19.82	M3
TEST TIME								93.70	SECONDS
CALC. TOTALIZER								20.099	M3
ERROR								-1.41	%

COMMENTS QUALITY MANAGEMENT STANDARDS INFO.					RESULTS	
Note: unit over reading by approx. 20mm adjusted P652	[QMS] INFORMATION	IDENT.	ID #	терт	AVG	PASS
parameter to correct measurement of head from P652	[REFERENCE] LEVEL	Sim. BOARD	Yes	IESI	%FS	FAIL
was 20.685mm to 40.5mm based on known board levels	PROCESS METER	PM	11	DISPLAY	-0.61	PASS
inserted under transducer.	STOP WATCH	SW	Yes	mA OUTPUT	-0.48	PASS
This AS LEFT report reflects the change in flows.				TOTALIZER	-1.41	PASS

Endress Hauser ProMag Series

Verification Report

AS FOUND CERTIFICATION

#### FORWARD FLOW DIRECTION

#### PASS

CLIENT DETAIL			EQUIPMENT DETAIL
CUSTOMER	OCWA - West Highlands Hub	[MUT] MANUFACTURER	ENDRESS & HAUSER
CONTACT	David Jorge	MODEL	Promag 50W
	Process Compliance Technician	CONVERTER S/N:	D6020C16000
	p: 519-925-1938 x 225	FUSE	Pull plug on board
	c: 519-938-6909		
	e: djorge@ocwa.com	PLANT ID	Mount Forest Cork St. S. Pumping Station
		METER ID	Station Flow
		FIT ID	FIT-1
		CLIENT TAG	OCWA# 205529
		OTHER	n/a
VER. BY - FM	Paris Machuk	GPS COORDINATES	N45 58.552 W080 44.687
Quality Manag Reference eq conduct this v document at t	gement Standards Information - uipment and instrumentation used to erification test is found in our AC-QMS he time this test was conducted.	VERIFICATION DATE CAL. FREQUENCY CAL. DUE DATE	September 20, 2019 Annual September, 2020

#### FORWARD TOTALIZER INFORMATION

1242959	M3
1243000	М3
41	M3
TEST CRIT	ERIA
	Yes
	Yes
	5
COMPONENTS TES	STED
	yes
	yes
	yes
	yes
	1242959 1243000 41 TEST CRIT

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

FLOW TUBE SIMULAT	ION								
				0.0	50.0	100.0	150.0	200.0	LPS
				0.0	15.9	31.8	47.7	63.7	% F.S. Flow
				0.0	25.0	50.0	75.0	100.0	% F.S. Range
REF. FLOW RATE				0.000	50.000	100.000	150.000	200.000	LPS
MUT [Reading]				0.000	49.948	99.940	149.890	199.860	LPS
MUT [Difference]				0.000	-0.052	-0.060	-0.110	-0.140	LPS
MUT [% Error]				n/a	-0.10	-0.06	-0.07	-0.07	% O.R
mA OUTPUT				4.000	8.000	12.000	16.000	20.000	mA
MUT [Reading]	min.	4	mA	3.997	7.992	11.989	15.983	19.978	mA
MUT [Difference]	max.	20	mA	-0.003	-0.008	-0.011	-0.017	-0.022	mA
MUT [% Error]				-0.08	-0.10	-0.09	-0.11	-0.11	% O.R
TOTALIZER - REF. FLO	OW RATE							200.000	LPS
TOTALIZER [MUT]								13	M3
TEST TIME								65.49	SECONDS
CALC. TOTALIZER								13.098	M3
ERROR								-0.75	%

~~	848		тс
<b>U</b> U	IVI IV	IEN	13

QUALITY MANAGEM	IENT STANDARI	OS INFO.	RES	JLTS			
[QMS] INFORMATION	IDENT.	ID #	TEST	AVG	PASS	1	
[REFERENCE] FTS	E&H (FC)	1		% o.r.	FAIL		
PROCESS METER	PM	11	DISPLAY	-0.08	PASS		
ANALOG METER	AM	N/A	mA OUTPUT	-0.10	PASS		
STOP WATCH	SW	Yes	TOTALIZER - RE	-0.75	PASS		

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



mm

LPS

LPS

200

314.150

200.000

1.0427

-3

PROGRAMMING PARAMETERS

DIAMETER (DN)

F.S. FLOW - MAG

F.S. RANGE - O/P

TUBE k-FACTOR

TUBE zero

#### FORWARD FLOW DIRECTION

#### PASS

yes

CLIENT DETAI	L			EQUIPMENT DETAIL
CUSTOMER	OCWA - West Highlands Hu	b	[MUT] MANUFACTURER	Krohne
CONTACT	David Jorge		MODEL	IFC100W
	Process Compliance Techni	cian	SERIAL NUMBER	C104591
	p: 519-925-1938 x 225		FUSE	CP-01 FU7
	c: 519-938-6909			
	e: djorge@ocwa.com		PLANT ID	Mounut Forest Durham St
			METER ID	Pump Station Flow
			FIT ID	FIT-1
			CLIENT TAG	OCWA# 205530
			OTHER	n/a
VER. BY - FM	Paris Machuk		GPS COORDINATES	N43 58.974 W080 44.477
conduct this v document at t	erification test is found in or he time this test was condu	ur AC-QMS cted.	CAL. FREQUENCY CAL. DUE DATE	Annual September, 2020
PROGRAMMIN	G PARAMETERS		FORWA	ARD TOTALIZER INFORMATION
DIAMETER (DN	l) mm	300	AS FOUND	317670.71 M3
F.S. FLOW - MA	AG LPS	852.2	AS LEFT	317700.57 M3
F.S. RANGE - C	D/P LPS	250.000	DIFFERENCE	29.86 M3
CAL. k-FACTOF	R GKL	7.9112		TEST CRITERIA
			AS FOUND CERTIFICATION	TEST Yes
			FORWARD FLOW DIRECTION	ON Yes
			ALLOWABLE [%] ERROR	5
				COMPONENTS TESTED
			CONVERTER DISPLAY	yes
			mA OUTPUT	yes
			TOTALIZER	Yes

#### Zero Offset Flow

<u>C</u><u>G</u>

**FLOWMETRIX** 

LPS

0.0000

#### FLOW TUBE SIMULATION

				0.0	0.5	1.0	2.0	m/s
				0.0	5.0	10.0	20.0	% F.S. Flow
				0.0	17.0	34.1	68.2	% F.S. Range
REF. FLOW RATE				0.00	42.61	85.22	170.45	LPS
MUT [Reading]				0.00	42.90	85.57	170.80	LPS
MUT [Difference]				0.00	0.29	0.35	0.35	LPS
MUT [% Error]				n/a	0.68	0.41	0.21	%
mA OUTPUT				4.000	6.727	9.454	14.909	mA
MUT [Reading]	min.	4.000	mA	3.998	6.747	9.474	14.931	mA
MUT [Difference]	max.	20.000	mA	-0.002	0.020	0.020	0.022	mA
MUT [% Error]				-0.05	0.30	0.21	0.15	%
TOTALIZER - REF. FLOW	RATE						170.447	LPS
TOTALIZER [MUT]							17	M3
TEST TIME							99.73	SECONDS
CALC. TOTALIZER							16.999	M3
ERROR							0.01	%

ACCURACY BASED ON [% o.r.]

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

#### COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.					RESULTS			
	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS	ĺ	
	[REFERENCE] FTS	KRO	1	TEST	% o.r.	FAIL	l	
	PROCESS METER	PM	11	DISPLAY	0.43	PASS		
	ANALOG METER	AM	N/A	mA OUTPUT	0.15	PASS	l	
	STOP WATCH	SW	Yes	TOTALIZER	0.01	PASS	l	
							L	

#### FORWARD FLOW DIRECTION

#### PASS

CLIENT DETAIL	<u> </u>		EQ	UIPMENT DETAIL
CUSTOMER	OCWA - West Highlands	Hub	[MUT] MANUFACTURER	Krohne
CONTACT	David Jorge		MODEL	IFC300W
	Process Compliance Tec	hnician	SERIAL NUMBER	C08 0273
	p: 519-925-1938 x 225		FUSE	Pull Plug on Board
	c: 519-938-6909			
	e: djorge@ocwa.com		PLANT ID Mount F	orest Water Street
			METER ID	Pump Station Flow
			FIT ID	FIT 401
			CLIENT TAG	n/a
			OTHER	OCWA# 205535
VER. BY - FM	Paris Machuk		GPS COORDINATES N 43 50.503	W080 44.085
Quality Manag	gement Standards Inform	ation -		
Reference eq	upment and instrumenta	tion used to	VERIFICATION DATE S	eptember 20, 2019
conduct this v	erification test is found in	our AC-QMS	CAL. FREQUENCY	Annual
uocument at t		uucleu.	CAL. DUE DATE	September, 2020
PROGRAMMIN	G PARAMETERS		FORWARD TOTALIZE	
DIAMETER (DN	l) mr	<b>n</b> 300	AS FOUND 80	31368.35 M3
F.S. FLOW - MA	G LP	S 785.9	AS LEFT 80	31397.52 M3
F.S. RANGE - C	/P LP	S 300.000	DIFFERENCE	29.17 M3
CAL. k-FACTOF	R GK	L 7.29500		TEST CRITERIA
			AS FOUND CERTIFICATION TEST	Yes
			FORWARD FLOW DIRECTION	Yes
			ALLOWABLE [%] ERROR	5
			COMP	ONENTS TESTED
			CONVERTER DISPLAY	yes
			mA OUTPUT	yes
			TOTALIZER	Yes
			ACCURACY BASED ON [% o.r.]	yes
Zero Offset Flow	v LP	S 0.0000	ERROR DOCUMENTED IN THIS REPORT; E	BASED ON % o.r.

#### FLOW TUBE SIMULATION

SCG

**FLOWMETRIX** 

				0.0	0.5	1.0	2.0	m/s
				0.0	5.0	10.0	20.0	% F.S. Flow
				0.0	13.1	26.2	52.4	% F.S. Range
REF. FLOW RATE				0.0	39.3	78.6	157.2	LPS
MUT [Reading]				0.0	39.8	79.1	157.7	LPS
MUT [Difference]				0.0	0.5	0.5	0.5	LPS
MUT [% Error]				n/a	1.29	0.65	0.34	%
mA OUTPUT				4.000	6.096	8.191	12.382	mA
MUT [Reading]	min.	4.000	mA	3.998	6.121	8.222	12.413	mA
MUT [Difference]	max.	20.000	mA	-0.002	0.025	0.031	0.031	mA
MUT [% Error]				-0.05	0.42	0.38	0.25	%
TOTALIZER - REF. FLOW	RATE						157.171	LPS
TOTALIZER [MUT]							17	M3
TEST TIME							107.26	SECONDS
CALC. TOTALIZER							16.858	M3
ERROR							0.83	%

#### COMMENTS

Note: Unable to locate sensor to validate	QUALITY MANAGEM	IENT STANDAR	RDS INFO.	RES	SULTS	
programmed parameters - assumed	[QMS] INFORMATION	IDENT.	ID #	TEOT	AVG	PASS
programming to be correct.	[REFERENCE] FTS	KRO	1	IESI	% o.r.	FAIL
	PROCESS METER	PM	11	DISPLAY	0.76	PASS
	ANALOG METER	AM	N/A	mA OUTPUT	0.25	PASS
	STOP WATCH	SW	Yes	TOTALIZER	0.83	PASS

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

2019 Annual Performance Report Mount Forest Wastewater Treatment Plant Certificate of Approval No. 6134-73F3FHHU

Appendix D

**Process Flow Schematic** 



F-927



SECTIONAL PLAN