2020 Annual Performance Report for the Orangeville Water Pollution Control Plant Environmental Compliance Approval 6038-9KBGN5

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Owned and Operated by the Town of Orangeville for the year 2020

SECTION 1 – Introduction

This report was prepared to inform the Ministry of Environment, Conservation and Parks (MECP) of the quality of effluent discharged from the Orangeville Water Pollution Control Plant (WPCP) in the year 2020. The facility receives residential, commercial, industrial wastewater along with some recreational vehicle sewage and provides a level of treatment to meet the Environmental Compliance Approval (ECA) issued to the WPCP for discharging into the Credit River, ultimately meeting Lake Ontario at Port Credit.

SECTION 2 – Project Description

The WPCP is a pre-denitrification activated sludge facility that in 2019 completed an expansion and upgrade project. The WPCP now has six aeration tanks and six denitrification tanks (designed for nitrification and denitrification of wastewater), phosphorus removal (by continuous aluminum sulphate feed), four secondary clarifiers and three sand filters as tertiary treatment. Sodium hypochlorite is used for disinfection of final effluent and sodium bisulphite is added for dechlorination.

Sludge is digested anaerobically in two primary digesters operated in parallel; however, one of the digesters was out of service for most of 2020. In December of 2020 the project to replace the roof was substantially completed and the digester was put back into service. Sludge loading facilities provide for transfer of digested anaerobic sludge to trucks. Digested sludge is land-applied as farm fertilizer or hauled to an off-site treatment facility.

A “Process Flow Schematic” is included in Appendix ‘A’ of this report.

SECTION 3 – WPCP Facts

Design Capacity	17,500 m³/day
Average Total Daily Flow (2020)	11,715 m³/day
Average Actual Daily Flow (2020)	11,308 m³/day
Average Recycled Daily Flow (2019)	408 m³/day
Receiving Water	Credit River
Service Population	30,113
Area Serviced (Ha)	1,546
Households Serviced	11,153
Environmental Compliance Approval	6038-9KBGN5
WPCP Classification	WWT-IV

Effluent Limits & Objectives

Effluent Limit – Monthly Loadings:

	$CBOD_5$ (kg/d)	Total Suspended Solids (kg/d)	Total Phosphorus (kg/d)	Total Ammonia Nitrogen (kg/d)	Total Nitrogen (kg/d)
January	87.5	87.5	2.6	35.0	170
February	87.5	87.5	2.6	35.0	170
March	87.5	87.5	2.6	35.0	150
April	87.5	87.5	2.6	35.0	140
May	87.5	87.5	2.6	22.8	125
June	87.5	87.5	2.6	22.8	125
July	87.5	87.5	2.6	22.8	125
August	87.5	87.5	2.6	22.8	125
September	87.5	87.5	2.6	22.8	125
October	87.5	87.5	2.6	22.8	125
November	87.5	87.5	2.6	35.0	140
December	87.5	87.5	2.6	35.0	170

Effluent Limit – Monthly Concentrations:

	$CBOD_5$ (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrogen (mg/L)	Total Nitrogen (mg/L)	Total Residual Chlorine (mg/L)
January	5.0	5.0	0.15	2.0	9.7	0.02
February	5.0	5.0	0.15	2.0	9.7	0.02
March	5.0	5.0	0.15	2.0	8.6	0.02
April	5.0	5.0	0.15	2.0	8.0	0.02
May	5.0	5.0	0.15	1.3	7.1	0.02
June	5.0	5.0	0.15	1.3	7.1	0.02
July	5.0	5.0	0.15	1.3	7.1	0.02
August	5.0	5.0	0.15	1.3	7.1	0.02
September	5.0	5.0	0.15	1.3	7.1	0.02
October	5.0	5.0	0.15	1.3	7.1	0.02
November	5.0	5.0	0.15	2.0	8.0	0.02
December	5.0	5.0	0.15	2.0	9.7	0.02

Effluent Limits – Other:

Parameter	Criteria
E. Coli	Monthly geometric mean does not exceed 200 organisms/100 mL
pH	Remains between 6.0 and 9.5 continuously

Effluent Objectives – Monthly Concentrations:

	$CBOD_5$ (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Ammonia Nitrogen (mg/L)	Total Nitrogen (mg/L)	Dissolved Oxygen (mg/L)	Total Residual Chlorine (mg/L)
January	4.0	4.0	0.12	1.75	8.5	5.0	Non-detectable
February	4.0	4.0	0.12	1.75	8.5	5.0	Non-detectable
March	4.0	4.0	0.12	1.75	7.5	5.0	Non-detectable
April	4.0	4.0	0.12	1.75	7.0	5.0	Non-detectable
May	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
June	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
July	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
August	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
September	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
October	4.0	4.0	0.12	1.0	6.0	5.0	Non-detectable
November	4.0	4.0	0.12	1.75	7.0	5.0	Non-detectable
December	4.0	4.0	0.12	1.75	8.5	5.0	Non-detectable

Effluent Objectives – Other:

Parameter	Criteria
E. Coli	Monthly geometric mean does not exceed 150 organisms/100 mL
pH	Remains between 6.5 and 8.5 continuously

SECTION 4 – Sampling Requirements and Procedures

Final effluent: a 24-hour composite sample is to be collected at least weekly and tested for $CBOD_5$, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen, Total Ammonia Nitrogen, (Nitrite + Nitrate) Nitrogen. In addition, concurrent grab samples are also collected for Total Residual Chlorine or Bisulphite Residual, E. Coli, pH and Temperature. Total Ammonia Nitrogen, pH and Temperature are used to calculate Unionized Ammonia.

Raw sewage: a 24-hour composite sample is to be collected at least monthly and tested for BOD_5, Total Suspended Solids, Total Kjeldahl Nitrogen, and Total Phosphorous.

Anaerobic sludge: a grab sample to be collected at least monthly during the non-spreading season and collected twice a month during the spreading season and tested for Total Solids, Nitrite, Nitrate, Total Phosphorus, Total Kjeldahl Nitrogen, Ph, E-Coli and Metals.

Procedures:

Raw sewage was sampled (at minimum) monthly, usually bi-weekly, and tested at a certified off-site lab for $CBOD_5$, BOD_5, Total Suspended Solids, Total Kjeldahl Nitrogen, Total Phosphorus and pH. Samples were collected using an automatic composite sampler over a twenty-four hour period.

Final effluent was sampled weekly and tested at a certified off-site lab for $CBOD_5$, Total Suspended Solids, Total Ammonia Nitrogen, Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate as Nitrogen, pH, Temperature, Un-ionized Ammonia and E. Coli. An automatic composite sampler (over a twenty-four hour period) was used to collect the samples upon which the concentrations of these parameters are based, with the exception of E. Coli and Un-ionized Ammonia. Grab samples of final effluent were collected concurrently with composite samples and tested in-house for

pH, Temperature and Total Residual Chlorine. The concentration of Un-ionized Ammonia is calculated using the grab sample pH and Temperature results along with the Total Ammonia concentration result from the twenty-four hour composite sample. In addition to this, daily samples of final effluent were also tested at the in-house lab for process control, including TSS, MLSS, and chemical parameters.

Biosolids sludge was collected and tested twice monthly. Also, the anaerobic sludge digestion process was monitored weekly on primary digester #2 and digestor #1 when it was back in service for pH, Total Solids, Volatile Solids, Volatile Acids and Alkalinity.

SECTION 5 – Summary of Report

In 2020, the Orangeville WPCP provided effective wastewater treatment, producing effluent with average removal rates for $CBOD_5$, TSS, and Total Phosphorus of 99.1% or better.

The annual average (actual) daily flow of 11,308 m^3/day was within the rated capacity for the WPCP.

The geometric mean density of E-Coli organisms for 2020 was 13 per 100 ml, indicating effective effluent disinfection.

The pH was measured at between 6.94 – 8.01 during 2020, which is within the required effluent objective.

The absence of a chlorine residual was measured by taking a test for the presence of sodium bisulphite. Sodium bisulphite was present at >1.13mg/l for all samples recorded.

The anaerobic sludge (biosolids) produced at the facility continued to meet all the Guidelines established for agricultural utilization. Entec Waste Management Inc. was contracted for the disposal of biosolids from the Orangeville WPCP until April 30th, 2020. On May 1st, 2020 a new contract was started with Lystek International Corporation.

Biosolids from the Orangeville WPCP were land applied inside Dufferin County in 2020 or hauled to Lystek for processing into a CFIA licensed fertilizer product.

SECTION 6 – Compliance with Provincial Regulations

The Orangeville Water Pollution Control Plant continues to provide excellent wastewater treatment. Operators at the facility continue to use their expertise to meet the objective of no exceedances of effluent limits. The following describes how this is accomplished:

- **Use of Accredited Labs:** Analytical tests to monitor the effluent quality are conducted by a laboratory audited by the Canadian Association for Environmental Analytical Laboratories (CAEAL) and accredited by the Standards Council of Canada (SCC). Accreditation ensures that the laboratory has acceptable laboratory protocols and test methods in place. It also requires the laboratory to provide evidence and assurances of the proficiency of the analysts performing the tests. During 2020 chemical sample analyses were conducted by SGS Canada Inc.

- **Operation by Licensed Operators:** This sewage system is operated by the Town of Orangeville's licensed staff. The mandatory licensing program for operators of sewage treatment facilities in Ontario is regulated under the Ontario Water Resources Act (OWRA) Regulation 435/93 and Ontario Regulation 129/04. Licensing means that an individual meets the education and experience requirements and has successfully passed the certification exam.

The following are certified operators who operated this facility during 2020 with current certified classification, certificate numbers and certificate expiry dates (TABLE 1):

Table 1

Operator	Level	Certificate #	Expiry Date
Jeff Hardy	WWT 4	#14016	Feb 29/24
Dean Soilleux	WWT 3	#14073	Dec 31/21
Evan Kieffer	WWT 1	#110572	Aug 31/23
Adair Palmer	WWT 4	#16209	Jun 30/21
Brad Thompson	WWT 2	#97383	Feb 28/23
John den Hoed	WWT 4	#12041	Mar 30/24

- **Sampling and Analytical Requirements:** The Town of Orangeville follows a sampling and analysis schedule which goes beyond the requirement of the ECA (as outlined previously in section of 4).

SECTION 7 – Flows

The total volume of sewage treated in 2020 was 4,287,795 m^3. There is recycled flow in the WPCP that is part of the total flow. This recycled flow is made up of sludge storage supernatant and thickener supernatant. The total recycled volume treated in 2020 was 149,183 m^3, which represents approximately 3.5% of the total flow. The actual volume of sewage entering the WPCP from the collection system in 2020 was 4,138,600 m^3, which is the total volume minus the recycled volume. The annual actual average daily flow of 11,308 m^3/day was approximately 65% of the new design capacity. The maximum daily peak flow in 2020 was 45,593 m^3/day which occurred on January 12, 2020 and represents approximately 78% of the new design peak flow of 58,313 m^3/day.

SECTION 8 – Raw Sewage & Final Effluent Quality

Raw Sewage Parameter	**2020 Annual Average (mg/L)**			**Loading (kg/day)**
BOD_5	305			3,451
$CBOD_5$	249			2,821
TSS	395			4,467
Nitrogen (TKN)	35.42			401
Total Phosphorus	7.11			80
Final Effluent Parameter	**2020 Annual Average (mg/L)**	**Effluent Objectives (mg/L)**	**Effluent Limits (mg/L)**	**Removal Efficiency (%)**
$CBOD_5$	2.3	4.0	5.0	99.1
TSS	2.8	4.0	5.0	99.3
Nitrogen (TKN)	1.04	n/a	n/a	97.1
Total Phosphorus	0.06	0.12	0.15	99.2
Ammonia-Nitrogen	0.27	1.0-1.75	1.3-2.0	n/a
Total Nitrogen	6.09	6-8.5	7.1-9.7	n/a
Dissolved Oxygen	7.84	>=5.0	n/a	n/a
Residual Chlorine	0.00*	Non-Detect	0.02	n/a
E. Coli	13	150 Organisms/100mL	200 Organisms/100mL	n/a
pH	6.94-8.01	6.5-8.5	6.0-9.5	n/a

*- based on presence of sodium bisulphite in final effluent

Effluent Objectives

The Operators and Supervisor have been trained to operate the plant to its best capabilities thus striving to achieve the established objectives. In 2020 all effluent objectives were met with the following exceptions:

Effluent Parameter	Month	Effluent Objective (mg/L)	Effluent Result (mg/L)
TSS	July	4.0	4.3
Total Nitrogen	April	7.0 (April)	7.01
	May	6.0 (May-Oct)	6.81
	June	6.0 (May-Oct)	7.50
	July	6.0 (May-Oct)	6.28

In the second half of July, the TSS results increased. To correct the issue, operators cleaned the final effluent composite sampler. The results in early August show that the issue was the sampler and that the concern had been fixed.

Between April and July, operators were taking measures to combat the high Total Nitrogen results in the final effluent. Blower filters were inspected and cleaned, solids balancing was being done daily, and splitter boxes were cleaned of rags and debris. In June a mixed liquor pump went down, which affected the June results. The pump was removed and sent for repair while the spare pump was put into service. Operators then began to see the results of all of these efforts improve the results in July into early August.

SECTION 9 – Sludge Management

Digested sludge produced at the Orangeville WPCP was land-applied in accordance with the Ontario Guidelines for Non-Agricultural Source Materials (NASM). Grab samples of digested (anaerobic) sludge were collected as the sludge truck was being filled. In 2020 sludge sample analyses were carried out by SGS Canada Inc. A summary of sludge sample results is provided in the "Annual Performance Summary" - Appendix 'B' of this report.

Sludge produced at the Orangeville WPCP met all the quality criteria specified in the Ontario Guidelines for Sewage Sludge Utilization on Agricultural Lands in 2020.

The certified sites and quantities of sludge haulage during 2020 can be found in the Annual Performance Summary – Appendix 'B'.

A total volume of 31,391 m^3 of sludge was produced for removal at the WPCP. The total amount applied to land was 5,478.2 m3 and total sent to Lystek was 25, 912.8 m3. The land application sites and volumes are below:

S-23058 Paul McCannell, Armstrong Farm- April 27-29th 775m3 and May 7, & 8th 1332.2 m^3
S-24382 Mitch Clark, Gunner Farm - August 765 m3 and September 450 m^3
S-23166 Leo Blydorp, 505083 Hwy 10 - August 1080 m^3
S-22740 Paul McCannell Farm - November 1076
In 2021, operators estimate that 35,000 m^3 of sludge will be produced at the Orangeville WPCP.

SECTION 10 - Bypassing and Abnormal Conditions:

Bypass Events

At times during the year, heavy rainfall events and snow melt may influence the wastewater treatment process at the WPCP. Infiltration and inflow of storm water and high ground water into the collection system will increase the flow to the WPCP, which will exceed the design capacity and sometimes the peak hydraulic capacity. This can create operational problems at the WPCP and therefore actions are taken to minimize the impact on the biological process as well as the final effluent.

There were two partial tertiary bypass events in 2020. On January 11th and 12th, the Orangeville WPCP experienced two partial tertiary by-passes of secondary effluent due to a major wet weather storm event. Around 100mm of rain fell in the area over a relatively short time on the weekend of January 9th-12th.

The first by-pass began on January 11th at 15:20 and went until 6:30 on January 12th, and the second by-pass was from 13:00 on January 12th to 7:00 on January 13th. During these times the Sandfilters were overwhelmed with high volumes of flow coming through the WPCP due to the rain event. Overall, 7,692 m3 and 4,356 m3 respectively by-passed the Sandfilters. The effluent (by-pass included) was continuously chlorinated and de-chlorinated.

Notifications of Non-Compliance

During June 2020, the monthly average of effluent total nitrogen was 7.5 mg/L, which exceeded the ECA monthly average limit of 7.1 mg/L. A mixed liquor return pump failed on June 16th, which is believed to be one of the possible causes of the exceedance. The spare pump was installed and put into operation by June 24th. Another possible cause was the elevated air and sewage temperatures had an affect on the dissolved oxygen efficiency and the microbiology in the treatment process. Total nitrogen was within ECA limits in the following months.

Record of this notification can be found in “Notification of Non-Compliance” – Appendix ‘C’ of this report.

Complaints or Concerns

In 2020, there was one complaint received at the WPCP. On April 27th Entec was hauling sludge and was using a Vacuum truck to clean out the centrate tank. A resident was concerned with the noise of the work. The resident was contacted, and the situation was explained to them. A follow up phone call was made the next day and the resident indicated that they were pleased with the explanation and response.

SECTION 11 - Maintenance and Calibration Activities:

Regular-scheduled preventive maintenance was assigned and monitored using the Preventative Maintenance Program. There was no "Planned Diversion of Flow" at the facility in 2020. Most breakdowns involved the contractor’s involvement pertaining to installation and equipment manufacturer’s warranty. Below is a list of work that was completed in 2020:

- A new exhaust system was installed at generator #1
- Two mixed liquor pumps were pulled and replaced
- Three mixers were replaced in the denitrification tanks
- Three blower motors were repaired
- Replacement of a Return Activated Sludge pump

Flowmetrix was contracted to complete the annual calibration of the WPCP metering devices in November 2020. Hach Sales and Service Canada was contracted to complete the annual calibration of the portable pH meter, spectrometer and pocket colorimeter. The metering devices were found to be in proper calibration with slight adjustments required. Copies of the calibration reports for the raw sewage flow meters, portable pH meter, spectrometer and pocket colorimeter can be found in Appendix 'D' of this report. All other calibration sheets are available at the WPCP upon request.

SECTION 12 - Inspection of the Facility by the Ministry of the Environment:

The last inspection of the Orangeville WPCP was conducted on August 1, 2018, by Carola Serwotka, Provincial Officer with the MEPC Guelph District Office, which resulted in an Inspection Report dated October 22, 2018.

SECTION 13 – Appendix

Appendix A – Process Flow Schematic 2020
Appendix B – Annual Performance Summary for 2020

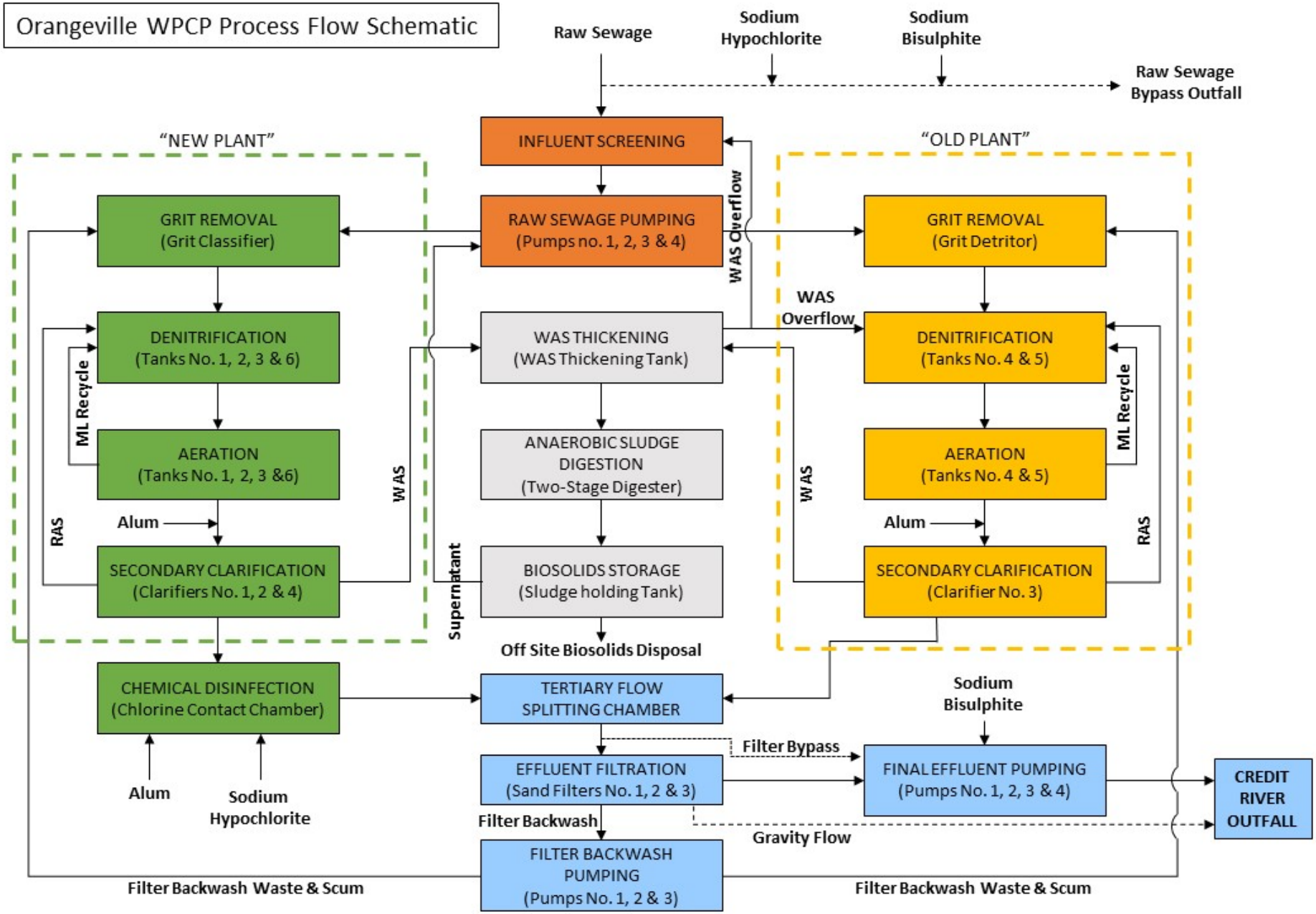
- **Flows and Average Daily Flow**
- **Bypass Events**
- **Annual Average Raw Sewage and Effluent Data**
- **Sludge Haulage**
- **Chemicals Used**
- **Biosolids Quality Data**
- **Sludge Haulage by Site**
- **Nutrient Loadings**

Appendix C – Notification of Non-Compliance 2020
Appendix D – Calibration Reports 2020

Appendix A

Process Flow Schematic

2020


Orangeville WPCP Process Flow Schematic
Raw Sewage
Sodium Hypochlorite
Sodium Bisulphite
Raw Sewage Bypass Outfall
"NEW PLANT"
"OLD PLANT"
INFLUENT SCREENING
GRIT REMOVAL (Grit Classifier)
RAW SEWAGE PUMPING (Pumps no. 1, 2, 3 & 4)
GRIT REMOVAL (Grit Detritor)
WAS Overflow
DENITRIFICATION (Tanks No. 1, 2, 3 & 6)
WAS THICKENING (WAS Thickening Tank)
DENITRIFICATION (Tanks No. 4 & 5)
ML Recycle
AERATION (Tanks No. 1, 2, 3 &6)
ANAEROBIC SLUDGE DIGESTION (Two-Stage Digester)
AERATION (Tanks No. 4 & 5)
WAS
RAS
Alum
SECONDARY CLARIFICATION (Clarifiers No. 1, 2 & 4)
Supernatant
BIOSOLIDS STORAGE (Sludge holding Tank)
SECONDARY CLARIFICATION (Clarifier No. 3)
Off Site Biosolids Disposal
CHEMICAL DISINFECTION (Chlorine Contact Chamber)
TERTIARY FLOW SPLITTING CHAMBER
Filter Bypass
EFFLUENT FILTRATION (Sand Filters No. 1, 2 & 3)
FINAL EFFLUENT PUMPING (Pumps No. 1, 2, 3 & 4)
CREDIT RIVER OUTFALL
Filter Backwash
Gravity Flow
FILTER BACKWASH PUMPING (Pumps No. 1, 2 & 3)
Filter Backwash Waste & Scum
Filter Backwash Waste & Scum

Appendix B

Annual Performance Summary

2020

ANNUAL SUMMARY FOR 2020

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	C. of A. LIMIT	C. of A. Objective
RAW SEWAGE FLOWS																
Total	1000m3	453.153	316.206	471.600	379.103	346.260	335.561	317.634	333.249	308.434	328.945	332.813	364.837	**4287.795**	**Total**	
Recycled Flow	1000m3	12.152	10.892	11.159	12.509	10.341	9.856	9.762	14.853	13.829	14.406	14.760	14.664	**149.183**	**Total**	
Actual Flow	1000m3	440.991	305.314	460.441	366.594	335.919	325.705	307.870	318.396	294.605	314.539	318.053	350.173	**4138.600**	**Total**	
Avg day flow of Total	1000m3/d	14.618	10.904	15.213	12.637	11.170	11.185	10.246	10.750	10.281	10.611	11.094	11.769	**11.715**	**17.500**	
Avg day flow of Actual	1000m3/d	14.226	10.528	14.853	12.220	10.836	10.857	9.931	10.271	9.820	10.146	10.602	11.296	**11.308**	Design	
Max day flow of Actual	1000m3/d	45.593	11.790	25.215	22.622	14.229	19.208	14.730	17.288	12.649	12.645	12.920	16.264	**45.593**		
RV and Septage Volume M3		39.4	40.7	206.1	0.2	15.4	1770.1	1861.1	4.9	6.9	1029.1	1111.1	3.9	**6088.9**		
BYPASS																
Primary Volume	1000m3													**0.000**	**Total**	
Time	hrs.													**0.0**	**Total**	
Secondary Volume	1000m3														**Total**	
Time	hrs.														**Total**	
Tertiary Volume	1000m3	12.048												**12.048**	**Total**	
Time	hrs.	33.0												**33.00**	**Total**	
RAW SEWAGE														**ANNUAL AVERAGE**		
BOD5	mg/l	313	305	232	359	413	252	253	358	356	282	249	292	**305**		
CBOD5	mg/l	292	281	150	237	315	325	183	368	213	194	178	260	**249**		
TSS	mg/l	364	209	277	348	286	351	364	568	606	559	303	509	**395**		
TKN	mg/l	56.10	28.65	20.85	24.15	32.50	31.30	30.87	44.17	37.55	48.25	27.00	43.65	**35.42**		
Total P	mg/l	5.0	4.8	3.7	3.3	9.14	5.9	6.0	11.0	9.2	10.6	7.2	9.6	**7.11**		
Chloride	mg/l	670	605	645	630	520	387	607	497	525	575	560	550	**564**		
Sodium	mg/l	305	356	315	303	313	284	346	295	291	298	281	298	**307**		
Alkalinity	mg/l										375	362	382	**373**		

Note: Average concentrations are calculated by dividing the total concentrations for the period by the number of test results recorded for the same period.

FINAL EFFLUENT														**ANNUAL AVERAGE**	Allowable Monthly Concentration	Monthly Objective Concentration
CBOD5	mg/l	2.8	2.0	2.8	2.3	2.3	2.0	2.0	2.2	2.0	2.3	2.0	2.6	**2.3**	**5**	**4**
TSS	mg/l	2.8	2.8	2.2	2.3	2.8	3.6	4.3	3.2	2.3	2.3	3.0	2.6	**2.8**	**5.0**	**4**
Ammonia	mg/l	0.25	0.15	0.40	0.25	0.43	0.34	0.38	0.10	0.10	0.10	0.10	0.66	**0.27**	**1.3 May-Oct/2.0 Nov-Apr**	**1.0 May-Oct/1.75 Nov-Apr**
TKN	mg/l	0.85	1.08	0.90	0.83	1.40	1.44	1.05	0.84	0.78	0.80	0.90	1.62	**1.04**		
Nitrite	mg/l	0.13	0.03	0.07	0.04	0.06	0.03	0.06	0.03	0.03	0.03	0.03	0.07	**0.05**		
Nitrate	mg/l	5.85	5.47	5.80	6.17	5.51	6.26	5.43	4.25	4.88	3.98	4.02	4.39	**5.17**		
Total Nitrogen	mg/l	6.73	6.54	6.76	7.01	6.81	7.50	6.28	4.90	5.53	4.68	4.65	5.76	**6.09**	**9.7 Dec-Feb/8.6 Mar/8.0 Apr/7.1 May-Oct/8.0 Nov**	**8.5Dec-Feb/7.5Mar/7Apr/6May-Oct/7Nov**
Total P	mg/l	0.04	0.06	0.03	0.04	0.05	0.08	0.08	0.12	0.04	0.06	0.06	0.04	**0.06**	**0.15**	**0.12**
pH (grab)		7.52	7.28	7.24	7.39	7.09	7.14	7.35	7.31	7.28	7.26	7.24	7.26	**7.28**	**6.0-9.5**	**6.5-8.5**
pH (min)		6.94	7.00	7.08	7.05	7.00	7.00	7.30	7.00	7.00	7.10	7.16	7.14		**6.0-9.5**	**6.5-8.5**
pH (max)		8.01	7.41	7.52	7.68	7.15	7.27	7.41	7.50	7.40	7.38	7.37	7.31		**6.0-9.5**	**6.5-8.5**
Temperature (grab)	Celsius	16.8	14.1	13.1	14.7	15.7	19.9	21.1	21.0	19.6	17.3	15.9	13.1	**16.8**		
Un-ionized Ammonia (Prov)	mg/l	0.0020	0.0010	0.0018	0.0018	0.0015	0.0018	0.0035	0.0010	0.0010	0.0010	0.0010	0.0032	**0.0017**		
Un-ionized Ammonia (Fed)	mg/l	0.0050	0.0045	0.0060	0.0070	0.0087	0.0090	0.0035	0.0027	0.0020	0.0020	0.0010	0.0050	**0.0047**		
Chloride	mg/l	395	548	491	560	538	562	578	534	520	528	503	522	**523**		
Sodium	mg/l	320	327	344	303	309	304	319	301	289	282	279	290	**305**		
Alkalinity	mg/l									266	261	246	269	**260**		
SBS Concentration	mg/l	2.00	1.20	2.00	2.00	1.60	1.41	1.82	2.94	2.36	1.17	2.15	1.95	**1.88**		**>0.00**
Dissolved Oxygen Grab	mg/l	9.10	8.91	8.27	8.11	7.35	6.76	6.72	6.46	7.40	8.17	8.32	8.53	**7.84**		**5.0 and higher**

Note: Average concentrations are calculated by dividing the total concentrations for the period divided by the number of test results recorded for the same period.

LOADINGS COMPLIANCE FOR 2020
FINAL EFFLUENT

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
TOTAL NITROGEN	kg/d	95.8	68.9	100.4	85.7	73.7	81.4	62.3	50.3	54.3	47.4	49.3	65.1	**69.5**
LIMIT	kg/d	**170**	**170**	**150**	**140**	**125**	**125**	**125**	**125**	**125**	**125**	**140**	**170**	
Total P	kg/d	0.5	0.6	0.5	0.5	0.5	0.8	0.7	1.2	0.4	0.6	0.6	0.4	**0.6**
LIMIT	kg/d	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	
Total Ammonia Nitrogen	kg/d	3.6	1.6	5.9	3.1	4.6	3.7	3.7	1.0	1.0	1.0	1.1	7.5	**3.1**
LIMIT	kg/d	**35.0**	**35.0**	**35.0**	**35.0**	**22.8**	**22.8**	**22.8**	**22.8**	**22.8**	**22.8**	**35.0**	**35.0**	
Total Suspended Solids	kg/d	39.1	29.0	32.7	27.5	29.8	39.1	42.2	32.9	22.1	22.8	31.8	29.4	**31.5**
LIMIT	kg/d	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	
CBOD5	kg/d	40.2	21.8	42.6	28.4	25.1	22.4	20.5	23.7	20.6	23.9	22.2	30.6	**26.8**
LIMIT	kg/d	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	

Note: Average loadings are calculated by multiplying the AVG loadings by the average daily flow then / 1000

CHEMICALS & SLUDGE HAULAGE for 2020

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	
Chlorine Used	kg	1885.0	1779.0	1718.0	1453.0	2650.0	1554.0	1617.0	1814.0	1430.0	1958.0	1745.0	1006.0	**20609.0**	**Total**
Chlorine Dosage	mg/l	4.27	5.83	3.73	3.96	7.89	4.77	5.25	5.70	4.85	6.22	5.49	2.87	**5.07**	**Average**
Total Chlorine Residual	mg/l	0.75	0.96	0.73	0.59	0.79	0.61	0.46	0.43	0.35	0.68	0.92	0.76	**0.67**	**Average**
Free Chlorine Residual	mg/l	0.24	0.36	0.19	0.14	0.24	0.11	0.07	0.04	0.07	0.15	0.34	0.14	**0.17**	**Average**
Sodium Bisulphite Used	kg	4599.0	3647.0	5226.0	4461.0	4081.0	3620.0	4052.0	4840.0	4729.0	5084.0	5201.0	5249.0	**54789.0**	**Total**
Sodium Bisulphite Dosage	mg/l	10.4	11.9	11.3	12.2	12.1	11.1	13.2	15.2	16.1	16.2	16.4	15.0	**13.42**	**Average**
Alum Used	kg	34404	23728	37284	30862	28695	27744	26087	27353	30047	33307	26416	27308	**353235.0**	**Total**
Alum Dosage	mg/l	78.0	77.7	81.0	84.2	85.4	85.2	84.7	85.9	102.0	105.9	83.1	78.0	**85.92**	**Average**
Sludge Haulage	m3	3105.0	2070.0	2460.0	2775.0	3308.2	2429.0	1678.0	2245.0	3804.0	1961.0	3365.0	2191.0	**31391.2**	**Total**
Total Solids	%	1.82	2.13	2.24	2.25	2.73	2.15	2.23	1.97	2.09	2.34	2.16	2.33	**2.20**	**Average**

Note: Chlorine dosage is calculated by dividing the chlorine used by the actual monthly flow and then x 1000.

BACTERIOLOGICAL DATA - 2020

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Sample #1	# per 100 mL	2	2	2	2	2	2	76	34	2	2	2	10	
Sample #2	# per 100 mL	2	2	58	2	2	10	47	96	2	4	2	56	
Sample #3	# per 100 mL	2	2	2	2	2	18	54	60	156	6	14	112	
Sample #4	# per 100 mL	2	2	2	2	2	56	54	22	78	2	8	2	
Sample #5	# per 100 mL			2			32		16				2	
Sample #6	# per 100 mL													
Sample #7	# per 100 mL													
Geometric Mean	**# per 100 mL**	**2.0**	**2.0**	**4.6**	**2.0**	**2.0**	**11.9**	**56.8**	**37.0**	**14.9**	**3.1**	**4.6**	**18.8**	**13**
Guideline	**# per 100 mL**	**<200**												
Objective	**# per 100 mL**	**<150**												

BIOSOLIDS DATA - 2020

Nutrients		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ammonia	mg/l	604	705	769	764	775	680	650	590	478	421	463	586
Phosphorus	mg/l	755	720	730	855	1035	700	610	735	705	890	795	755
Nitrate	mg/l	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Ammonia + Nitrate	mg/l	603.8	704.8	769.3	763.8	775.3	680.3	650.3	589.8	478.3	421.3	463.3	585.8
TSS	mg/l	18200	21300	22400	22450	27300	21500	22300	19650	20900	23350	21550	23300

Note: Average concentrations are calculated by dividing the total concentrations for the period divided by the number of test results recorded for the same period.

Metal Concentrations													
Arsenic	mg/l	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cadmium	mg/l	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Chromium	mg/l	0.37	0.5	0.5	0.6	0.6	0.4	0.4	0.5	0.4	0.5	0.4	0.6
Cobalt	mg/l	0.03	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Copper	mg/l	6.7	7.85	9.6	10.0	12.3	11.5	11.6	12.5	9.5	13.0	11.0	10.8
Lead	mg/l	0.20	0.25	0.20	0.25	0.25	0.20	0.15	0.25	0.20	0.30	0.25	0.25
Mercury	mg/l	0.007	0.008	0.014	0.022	0.010	0.005	0.0045	0.008	0.007	0.008	0.011	0.016
Molybdenum	mg/l	0.09	0.10	0.09	0.11	0.16	0.10	0.08	0.10	0.08	0.10	0.09	0.10
Nickel	mg/l	0.22	0.3	0.32	0.38	0.455	0.515	0.54	0.48	0.30	0.38	0.30	0.30
Selenium	mg/l	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.10	0.10	0.10	0.10
Zinc	mg/l	7.6	8.0	8.5	9.0	12.5	8.5	9.5	13.0	11.0	13.0	11.5	11.0

Note: Average concentrations are calculated by dividing the total concentrations for the period divided by the number of test results recorded for the same period.

Ammonia/Metal Ratios		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arsenic	(Min. 100)	6038	7048	7693	7638	7753	6803	6503	5898	4783	4213	4633	5858
Cadmium	(Min. 500)	63558	54215	61544	61104	57430	61845	72256	43689	56271	36635	46330	58580
Chromium	(Min. 6)	1654	1438	1508	1389	1261	1529	1586	1229	1275	818	1041	937
Cobalt	(Min. 50)	20127	15662	17096	15276	15506	17008	16258	14745	13666	10533	13237	16737
Copper	(Min. 10)	90	90	80	76	63	59	56	47	50	32	42	54
Lead	(Min. 15)	3019	2819	3847	3055	3101	3402	4335	2359	2392	1404	1853	2343
Mercury	(Min. 1500)	86257	93973	54950	35526	81611	136060	144511	73725	68329	52663	42118	36613
Molybdenum	(Min. 180)	7104	7048	8548	6944	4846	7161	8671	6208	5979	4435	5451	6166
Nickel	(Min. 40)	2745	2563	2404	2037	1704	1321	1204	1242	1621	1123	1571	1953
Selenium	(Min. 500)	6038	7048	7693	7638	7753	6803	6503	5898	4783	4213	4633	5858
Zinc	(Min. 4)	79	88	91	85	62	80	68	45	43	32	40	53

Note: Average ratios are calculated by dividing the total rations for the period divided by the number of test results recorded for the same period.

SLUDGE HAULAGE BY SITE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL TOTALS
		3105.0	**2070.0**	**2460.0**	**2775.0**	**3308.2**	**2429.0**	**1678.0**	**2245.0**	**3804.0**	**1961.0**	**3365.0**	**2191.0**	31391.2
ENTEC (sludge pressed)														0.0
LYSTEC (liquid hauled)		3105.0	2070.0	2460.0	2000.0	1976.0	2429.0	1678.0	1480.0	2274.0	1961	2289.0	2191.0	25913.0
Certificate of Approval Total	Site #													0.0
S-21036														0.0
S-21353														0.0
S-21533														0.0
S-20143														0.0
S-20333														0.0
S-20424														0.0
S-20508														0.0
S-20514														0.0
S-20788														0.0
S-20789														0.0
S-20990														0.0
S-22042														0.0
S-22740												1076.0		1076.0
S-22424														0.0
S-23058					775.0	1332.2								2107.2
S-1808-77														0.0
S-1808-76														0.0
S-24382									765.0	450.0				1215.0
S-23166										1080.0				1080.0

Appendix C

Notification of Non-Compliance

2020

NOTIFICATION OF NON-COMPLIANCE

Tuesday July 14, 2020

Ms. Carola Serwotka
Provincial Officer – Guelph District Office
Ontario Ministry of the Environment, Climate and Parks
1 Stone Road West, 4th Floor
Guelph ON
N1G 4Y2

Re: Notification of Non-Compliance

Dear Ms. Serwotka

This is a notification of Non-Compliance at the Orangeville Water Pollution Control Plant (WPCP) located at 16 Town Line Rd; Orangeville; County of Dufferin with Environmental Compliance Approval No. 6038-9KBGN5.

The monthly average of final effluent Total Nitrogen exceeded the ECA limits. The June monthly average limit is 7.1 mg/l and the actual monthly average was 7.5 mg/l according to SGS Environmental analytical guideline reports.

The Town of Orangeville believes that possible causes of the exceedance were:

- a mixed liquor return pump failed on June 16th. The spare pump was installed and in operation by June 24th.
- Elevated air and sewage temperatures which have an effect on dissolved oxygen efficiency and the microbiology in the treatment process.

If you have any questions, please contact the undersigned at (519) 941-0440 ext. 4701.

Regards,

John den Hoed

Supervisor, Wastewater
Town of Orangeville

Cc: Doug Jones, GM, Infrastructure Services, Town of Orangeville
Tara Clayton, Manager, Public Works, Town of Orangeville

Appendix D

Calibration Reports

2020

Certificate of Instrument Performance
Certificat de Conformité

Company Name / Nom de la Compagnie : TOWN OF ORANGEVILLE

Account Number / No. de compte : 40171042

Certification Number / Numéro du Certificat : WO-00636394

Part Number / No. de pièce : LPV445.97.00110	ee DR300 - Chlorine, Free + Total, w.Box. Pocket Colorimeter
Serial Number / No. de série : 19010A001787	
External Reference / Référence externe :	

Hach Sales & Service Canada Ltd. certifies that your instrument has been serviced, calibrated, verified with standards and now meets new product specifications.

Hach Sales & Service Canada Ltd. atteste que votre instrument a été entretenu, calibré et vérifié selon les normes en vigueur. Ses spécifications actuelles sont équivalentes à celles d'un produit neuf.

Certified by / Certifié par :

Stephen Bilton

Certification Date / Date de certification :

4/22/2020

Certificate of Instrument Performance
Certificat de Conformité

Company Name / Nom de la Compagnie : TOWN OF ORANGEVILLE

Account Number / No. de compte : 40171042

Certification Number / Numéro du Certificat : WO-00636394

Part Number / No. de pièce : DR2800-01	oo aa DR2800 SPECTRO W/O BATTERY PACK
Serial Number / No. de série : 1160686	
External Reference / Référence externe :	

Hach Sales & Service Canada Ltd. certifies that your instrument has been serviced, calibrated, verified with standards and now meets new product specifications.

Hach Sales & Service Canada Ltd. atteste que votre instrument a été entretenu, calibré et vérifié selon les normes en vigueur. Ses spécifications actuelles sont équivalentes à celles d'un produit neuf.

Certified by / Certifié par :

Stephen Bilton

Certification Date / Date de certification :

4/22/2020

Certificate of Instrument Performance
Certificat de Conformité

Company Name / Nom de la Compagnie : TOWN OF ORANGEVILLE

Account Number / No. de compte : 40171042

Certification Number / Numéro du Certificat : WO-00636394

Part Number / No. de pièce : HQ40D	vv HQ40d MULTI PORTABLE METER
Serial Number / No. de série : 081000025025	
External Reference / Référence externe :	

Hach Sales & Service Canada Ltd. certifies that your instrument has been serviced, calibrated, verified with standards and now meets new product specifications.

Hach Sales & Service Canada Ltd. atteste que votre instrument a été entretenu, calibré et vérifié selon les normes en vigueur. Ses spécifications actuelles sont équivalentes à celles d'un produit neuf.

Certified by / Certifié par :

Stephen Bilton

Certification Date / Date de certification :

4/22/2020

Hach ServicePlus™

FIELD SERVICE REPORT / RAPPORT DE SERVICE DE TERRAIN

Account Number / No. de Compte: 40171042
Customer / Client: TOWN OF ORANGEVILLE
Phone / Téléphone: 1 519 938-6340
Location: TOWN OF ORANGEVILLE, 16 TOWN LINE WATER POLLUTION CONTROL PLANT, ORANGEVILLE, Ontario, L9W 3T6, CA

Contact Name / Nom du Contact: DEAN SOILLEUX
Fax:
Email Address / Adresse: dsoilleux@orangeville.ca
Technician / Technicien: Stephen Bilton

Work Order Number / Numéro de Commande: WO-00636394
Purchase Order / Bon de Commande: VERBAL DEAN 02.12.20
Date of Service / Date de service: 4/22/2020

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag
DR2800-01	oo aa DR2800 SPECTRO W/O BATTERY PACK	1160686	

Notes

as found: reads standards within tolerances, version 1.10, cleaned, inspected, replaced VIS lamp, performed service inspection procedure and calibrations, verified calibration with Hach test filter set# 3472 exp 30jun2020, unit is performing to factory specifications. Certification results were as follows: 11/2: 0.321 +/- 3%(read 0.324), 5/2: 0.595 +/- 3% (read 0.598), 9/1: 1.422 +/- 3% (read 1.431), 450/3 >2.8 (read 4.487), Ho 360.9 +/- 2nm (read 360.1), 20/2 807.0 +/- 2nm (read 807.0), passed on all tests

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag
LPV445.97.00110	ee DR300 - Chlorine, Free + Total, w.Box, Pocket Colorimeter	19010A001787	

Notes

As found, the condition of the meter was good. The exterior, sample compartment, and optics were cleaned. The meter was inspected, including the interference filter, sample cup, and sample cell retaining springs. The batteries were replaced, and the battery terminals were inspected. The operation was tested, the factory default calibration was restored, and wavelength accuracy was verified using PCII SpecCheck Secondary Standard. (Parameter of PCII) Lot A9288 oct21. Verification of secondary standards results as follows: Std1: 0.23 (0.24 +/- 0.09) Std2: 0.92 (0.93 +/-0.10) , Std3: 1.66 (1.71 +/- 0.14). After service was completed, the meter was restored to normal operation, and performance and condition were within specifications.

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag
HQ40D	vv HQ40d MULTI PORTABLE METER	081000025025	

Notes

As found, the condition of the meter was good. The meter was cleaned, inspected, and the batteries were replaced. Communication with probes and data storage in the meter was verified. The pH probe was calibrated and verified using pH buffer standards. The calibration results were: pH 4 - 4.11, pH 7 - 6.97, pH 10 - 10.11, and the slope was - 55.7. The measurement performance of the probe following service and calibration was verified using certified pH standards. Also, replaced LDO kit, as left reads 9.63 mg/l in air. After PM service was completed, both the meter and the probe were restored to normal operation, and their performance and condition were within specifications.

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag

Notes

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag

Notes

Product / Produit	Product / Produit Description	Serial Number / No. de Série	Asset Tag

Notes

FLOWMETRIX | METCON | PROCESS

FLOW, PRESSURE and LEVEL INSTRUMENTATION

Verification/Calibration

REPORT

FOR THE TOWN OF

Orangeville

NOVMEBER 2020

November 27, 2020

Town of Orangeville
John den Hoed
Supervisor, Wastewater Infrastructure
16 Town Line
Orangeville, ON
C: 519-939-8820
E:jdenhoed@orangeville.ca

RE: Annual Orangeville WWTP Flowmeter Verification/Calibration

November 18, 2020

Dear John den Hoed,

SCG Flowmetrix appreciates the opportunity to complete your annual 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 Quality Assurance and Quality Control.

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

Kind Regards,

Sheena Cooper

Sheena Cooper
Sales & Service Coordinator
#3, 15 Connie Crescent
Concord, ON L4K 1L3
c. 519-281-9660
scooper@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 in 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. Section (i) identifies an equipment summary of all instruments verified during this service project including instruments that PASS or FAIL; section (ii) 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.

APPENDIX A

EQUIPMENT SUMMARY LIST

Instrument Verification
Certificate of Completion

CLIENT ORANGEVILLE WWTP

LOCATION ORANGEVILLE, ON

Summary - Equipment List											
#	LOCATION	DESCRIPTION	MANUFACTURER	MODEL	SERIAL NUMBER	FIT #	TECH	CSE	VERIFICATION INFO.		
									DATE	FREQ.	DUE
EQUIPMENT LIST - PASS											
1	Orangeville WWTP	By Pass Flow	Endress + Hauser	Promag 53W	E11DCF19000	FIT-205	PM	-	17-Nov-20	Annual	Nov-21
2	Orangeville WWTP	Filter Backwash Flow	Endress + Hauser	Promag 53P	E1096916000	FIT-204	PM	-	17-Nov-20	Annual	Nov-21
3	Orangeville WWTP	WAS Flow	ABB	MagMaster	V/87510/3/2	FIT-06	PM	-	18-Nov-20	Annual	Nov-21
4	Orangeville WWTP	Old Plant Raw Flow	Endress + Hauser	Promag 53W	E10A5D16000	FIT-102	PM	-	17-Nov-20	Annual	Nov-21
5	Orangeville WWTP	New Plant Raw Flow	Endress + Hauser	Promag 53W	E10A5C16000	FIT-103	PM	-	17-Nov-20	Annual	Nov-21
6	Orangeville WWTP	Sludge Transfer Flow	Krohne	IFC 020D	0412/04	N/A	PM	-	18-Nov-20	Annual	Nov-21
7	Orangeville WWTP	Supernatant Flow	ABB	MagMaster	V/87510/3/5	FIT-11	PM	-	18-Nov-20	Annual	Nov-21
8	Orangeville WWTP	Sludge Loading Flow	ABB	MagMaster	V/87510/3/1	FIT-12	PM	-	18-Nov-20	Annual	Nov-21
9	Orangeville WWTP	Remote Totalizer-Sludge Loading	Omeron	H7EC	N/A	N/A	PM	-	18-Nov-20	Annual	Nov-21
10	Orangeville WWTP	Influent Flow	Marsh McBirney	FLO DAR	N/A	N/A	PM	YES	18-Nov-20	Annual	Nov-21
11	Orangeville WWTP	Waste Flow	Endress + Hauser	Promag 400	L6114E19000	FIT304	PM	-	18-Nov-20	Annual	Nov-21
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											

This Instrument Verification Certificate of Completion summary sheet identifies all instruments tested that PASSED verification/calibration testing during our service contract.
Any instrument that does not PASS verification or cannot be calibrated during this contract is highlighted for quick identification.
Further information should be identified within the body of our report.

SCG FLOWMETRIX

APPENDIX B
INDIVIDUAL
INSTRUMENT REPORTS

Instrument Verification
Certificate of Completion

APPENDIX B

Client TOWN OF ORANGEVILLE

Location ORANGEVILLE WWTP

SUMMARY - NOTES / DEFICIENCY LIST

UNIT	LOCATION	PASS/FAIL	COMMENTS
SUPERNATANT FLOW	ORANGEVILLE WWTP	NOTE	Based on another ABB verification OEM equipment - unit showed that the Electrode 1 and 2 Failed - possible cause being electrodes may be fouled. Recommend removing sensor and cleaning in the measurement area to remove any build up on Electrodes. **NOTE: no disconnect has been found for this unit - PLEASE ADDRESS THIS PRIOR TO NEXT VISIT OR INSTALL POWER SWITCH AT UNIT.**
SLUDGE LOADING FLOW	ORANGEVILLE WWTP	NOTE	Customer experiencing flows jumping around going positive or negative, including high flows while unit is at a zero process state - upon arrival totalizer showing about -46 m3. When using ABB's VSE MagMaster Simulator readings are stable and unit PASS (primary sensor tube is disconnected and this simulator is connected in it's place) - this is indicating that the sensor or wiring as a possible causing for these issues - Based on another ABB verification OEM equipment, CalMaster - a message came up indicating Coil Driver issues, this was shown to John den Hoed, possible cause wiring issues - Flowmetrix rewired the transmitter side - unable to get to sensor side due to limited access and can't see wiring to perform rewire - tried CalMaster again and message about Coil Driver was shown - continued with verification - unit showed that the Electrode 1 and 2 Failed (same as above) - possible cause being electrodes may be fouled. Recommend removing sensor and cleaning in the measurement area to remove any build up on Electrodes. **NOTE: no disconnect has been found for this unit - PLEASE ADDRESS THIS PRIOR TO NEXT VISIT OR INSTALL POWER SWITCH AT UNIT.**
INFLUENT FLOW METER	ORANGEVILLE WWTP	NOTE	This unit PASSED - However unit is not working as expected - as mentioned in previous years unit is very slow to respond to level changes 1.5 to 2 min - unit needs to be repaired or replaced - when repair/replacement is completed - would recommend, in warmer weather, a full review of the setup and verification should be performed to ensure accurate measurement of flow.

Endress Hauser ProMag Series
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Town of Orangeville
CONTACT	John den Hoed Supervisor, Wastewater Infrastructure Services 16 Town Line, Orangeville, ON cell:(519) 939-8820 E:jdenhoed@orangeville.ca

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	ENDRESS & HAUSER
MODEL	Promag 53W
CONVERTER S/N:	E11DCF19000
PLANT ID	Orangeville STP
METER ID	By Pass Flow Meter
FIT ID	FIT-205
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 17, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

VER. BY - FM *Paris Machuk*

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

PROGRAMMING PARAMETERS		
DIAMETER (DN)	mm	750
F.S. FLOW - MAG	LPS	4417.734
F.S. RANGE - O/P	LPS	600.000
TUBE k-FACTOR		1.18100
TUBE zero		3

FORWARD TOTALIZER INFORMATION		
AS FOUND	1296039	M3
AS LEFT	1296219	M3
DIFFERENCE	180	M3

TEST CRITERIA	
AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED	
CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0 **0.0** **0.0**	**150.0** **3.4** **25.0**	**300.0** **6.8** **50.0**	**450.0** **10.2** **75.0**	**600.0** **13.6** **100.0**	**LPS** **% F.S. Flow** **% F.S. Range**
REF. FLOW RATE				**0.00**	**150.00**	**300.00**	**450.00**	**600.00**	LPS
MUT [Reading]				0.00	149.39	300.10	450.04	600.06	LPS
MUT [Difference]				0.00	-0.61	0.10	0.04	0.06	LPS
MUT [% Error]				n/a	-0.41	0.03	0.01	0.01	% O.R
mA OUTPUT				**4.000**	**8.000**	**12.000**	**16.000**	**20.000**	mA
MUT [Reading]	min.	4	mA	3.997	7.982	12.002	15.994	19.996	mA
MUT [Difference]	max.	20	mA	-0.003	-0.018	0.002	-0.006	-0.004	mA
MUT [% Error]				-0.08	-0.22	0.02	-0.04	-0.02	% O.R
TOTALIZER - REF. FLOW RATE								**600.000**	LPS
TOTALIZER [MUT]								60	M3
TEST TIME								100.04	SECONDS
CALC. TOTALIZER								60.024	M3
ERROR								-0.04	%

COMMENTS

Note: parameters on tube not checked as CSE is needed - therefore assumed programmed parameters to be correct.

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	E&H (FC)	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.09	PASS
mA OUTPUT	-0.07	PASS
TOTALIZER - R	-0.04	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.

Endress Hauser
ProMag Series
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Town of Orangeville
CONTACT	John den Hoed
	Supervisor, Wastewater Infrastructure Services
	16 Town Line, Orangeville, ON
	cell:(519) 939-8820
	E:jdenhoed@orangeville.ca

VER. BY - FM *Paris Machuk*

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	ENDRESS & HAUSER
MODEL	Promag 53P
CONVERTER S/N:	E1096916000
FUSE	PLC-501 Panel fuse FU FIT204
PLANT ID	Orangeville STP
METER ID	Filter Backwash Flow Meter
FIT ID	FIT-204
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 17, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

PROGRAMMING PARAMETERS		
DIAMETER (DN)	mm	300
F.S. FLOW - MAG	LPS	706.838
F.S. RANGE - O/P	LPS	250.000
TUBE k-FACTOR		1.27770
TUBE zero		-1

FORWARD TOTALIZER INFORMATION		
AS FOUND	1832544	M3
AS LEFT	1832604	M3
DIFFERENCE	60	M3

TEST CRITERIA	
AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED	
CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	**62.5**	**125.0**	**187.5**	**250.0**	**LPS**
				0.0	**8.8**	**17.7**	**26.5**	**35.4**	**% F.S. Flow**
				0.0	**25.0**	**50.0**	**75.0**	**100.0**	**% F.S. Range**
REF. FLOW RATE				**0.00**	**62.50**	**125.00**	**187.50**	**250.00**	LPS
MUT [Reading]				0.00	62.52	124.10	187.41	249.99	LPS
MUT [Difference]				0.00	0.02	-0.90	-0.09	-0.01	LPS
MUT [% Error]				n/a	0.03	-0.72	-0.05	0.00	% O.R
mA OUTPUT				**4.000**	**8.000**	**12.000**	**16.000**	**20.000**	mA
MUT [Reading]	min.	4	mA	3.998	7.997	11.993	15.992	19.994	mA
MUT [Difference]	max.	20	mA	-0.002	-0.003	-0.007	-0.008	-0.006	mA
MUT [% Error]				-0.05	-0.04	-0.06	-0.05	-0.03	% O.R
TOTALIZER - REF. FLOW RATE								**250.000**	LPS
TOTALIZER [MUT]								19	M3
TEST TIME								75.97	SECONDS
CALC. TOTALIZER								18.993	M3
ERROR								0.04	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	E&H (FC)	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.19	PASS
mA OUTPUT	-0.05	PASS
TOTALIZER - R	0.04	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.

ABB WATERMASTER

Verification Report

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Town of Orangeville
CONTACT John den Hoed
Supervisor, Wastewater Infrastructure Services
16 Town Line, Orangeville, ON
cell:(519) 939-8820
E:jdenhoed@orangeville.ca

VER. BY - FM Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

MODEL	WaterMaster
SENSOR SERIAL NUMBER	3K672018451344
CONVERTER SERIAL NUMBER	3K220000657162
SENSOR SIZE (DN)	80
PLANT ID	Orangeville WTP
METER ID	WAS Flow
FIT ID	FIT-351
CLIENT TAG	n/a
OTHER	n/a
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 18, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

SENSOR INFORMATION

Q3	l/s	44.44	
CALIBRATION ACCURACY		OIML Class 2	
SENSOR CAL. ACCURACY	%	123.7	
	mm/sec	-0.06	
	~	11	
DATE OF MANUFACTURE		31-May-19	
RUN HOURS	d/h/m	322/17/6788	

TRANMITTER INFORMATION

APPLICATION VERSION		V01.07.00	03/02/17
MSP VERSION		01.00.00	
DATE OF MANUFACTURE		31-May-19	
RUN HOURS	d/h/m	105/22/8960	
ALLOWABLE TOLERANCE	%	5.0	

CURRENT OUTPUT

OUTPUT TEST	4.00 20.00	READING mA	ERROR %	PASS FAIL
4.0 mA	4.00	3.999	-0.02	PASS
12.0 mA	12.00	11.986	-0.12	PASS
20.0 mA	20.00	19.999	-0.01	PASS

PULSE OUTPUT

OUTPUT TEST		READING mA	ERROR %	PASS FAIL
OUTPUT 1, Hz	100	N/A	N/A	N/A
OUTPUT 1, Hz	50	N/A	N/A	N/A
OUTPUT 2, Hz	100	N/A	N/A	N/A
OUTPUT 2, Hz	50	N/A	N/A	N/A

VERIFICATION HISTORY

OIML Accuracy Alarms	0	

TOTALIZER INFORMATION

FORWARD	149806.47	m3
REVERSE	0.58	m3
NET	149805.89	m3

SENSOR DATA

COIL CURRENT	179.9	mA
COIL INDUCTANCE	80.3	mH
COIL SHIFT	0.2	%
COIL/LOOP RESISTANCE	29.4	ohm

TRANSMITTER DATA

TX GAIN - ADJUSTMENT	0	%

VeriMASTER INFORMATION

VERSION	01.00.03
LIMIT VERSION	01.00.01

CONFIGURATION SETTINGS

MAINS/FREQUENCY		60	Hz
QMAX		44.44	l/s
PULSES/UNIT		1	
PULSES LIMIT FREQUENCY		100	Hz
SENSOR USER	SPAN	100	%
	ZERO	0	mm/s
USER FLOW	CUTOFF	0	%
	HYSTERESIS	20	%
METER MODE		Forward	

COMMENTS

Used DMM-11 to Confirm mA Output

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBWM	3
PROCESS METER	PM	11

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

Endress Hauser
ProMag Series
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Town of Orangeville
CONTACT	John den Hoed
	Supervisor, Wastewater Infrastructure Services
	16 Town Line, Orangeville, ON
	cell:(519) 939-8820
	E:jdenhoed@orangeville.ca

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	ENDRESS & HAUSER
MODEL	Promag 53W
CONVERTER S/N:	E10A5D16000
FUSE	Pull Plug On Unit
PLANT ID	Orangeville STP
METER ID	Old Plant Raw Sewage Flow Meter
FIT ID	FIT-102
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 17, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

VER. BY - FM *Paris Machuk*

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

PROGRAMMING PARAMETERS		
DIAMETER (DN)	mm	400
F.S. FLOW - MAG	LPS	1256.600
F.S. RANGE - O/P	LPS	250.000
TUBE k-FACTOR		1.07320
TUBE zero		-7

FORWARD TOTALIZER INFORMATION		
AS FOUND	7797410	M3
AS LEFT	7797491	M3
DIFFERENCE	81	M3

TEST CRITERIA	
AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED	
CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	**62.5**	**125.0**	**187.5**	**250.0**	**LPS**
				0.0	**5.0**	**9.9**	**14.9**	**19.9**	**% F.S. Flow**
				0.0	**25.0**	**50.0**	**75.0**	**100.0**	**% F.S. Range**
REF. FLOW RATE				**0.00**	**62.50**	**125.00**	**187.50**	**250.00**	LPS
MUT [Reading]				0.00	62.24	124.48	186.79	249.05	LPS
MUT [Difference]				0.00	-0.26	-0.52	-0.71	-0.95	LPS
MUT [% Error]				n/a	-0.41	-0.42	-0.38	-0.38	% O.R
mA OUTPUT				**4.000**	**8.000**	**12.000**	**16.000**	**20.000**	mA
MUT [Reading]	min.	4	mA	3.998	7.981	11.962	15.941	19.932	mA
MUT [Difference]	max.	20	mA	-0.002	-0.019	-0.038	-0.059	-0.068	mA
MUT [% Error]				-0.05	-0.24	-0.32	-0.37	-0.34	% O.R
TOTALIZER - REF. FLOW RATE								**250.000**	LPS
TOTALIZER [MUT]								31	M3
TEST TIME								123.39	SECONDS
CALC. TOTALIZER								30.848	M3
ERROR								0.49	%

COMMENTS

Note: this was originally labelled as FIT-202

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	E&H (FC)	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.40	PASS
mA OUTPUT	-0.26	PASS
TOTALIZER - R	0.49	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.

Endress Hauser
ProMag Series
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL	
CUSTOMER	Town of Orangeville
CONTACT	John den Hoed
	Supervisor, Wastewater Infrastructure Services
	16 Town Line, Orangeville, ON
	cell:(519) 939-8820
	E:jdenhoed@orangeville.ca

VER. BY - FM *Paris Machuk*

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL	
[MUT] MANUFACTURER	ENDRESS & HAUSER
MODEL	Promag 53W
CONVERTER S/N:	E10A5C16000
FUSE	Pull Plug On Unit
PLANT ID	Orangeville STP
METER ID	New Plant Raw Sewage Flow Meter
FIT ID	FIT-103
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 17, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

PROGRAMMING PARAMETERS		
DIAMETER (DN)	mm	600
F.S. FLOW - MAG	LPS	2827.350
F.S. RANGE - O/P	LPS	550.000
TUBE k-FACTOR		1.25170
TUBE zero		-1

FORWARD TOTALIZER INFORMATION		
AS FOUND	6595409	M3
AS LEFT	6595559	M3
DIFFERENCE	150	M3

TEST CRITERIA	
AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED	
CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	**137.5**	**275.0**	**412.5**	**550.0**	**LPS**
				0.0	**4.9**	**9.7**	**14.6**	**19.5**	**% F.S. Flow**
				0.0	**25.0**	**50.0**	**75.0**	**100.0**	**% F.S. Range**
REF. FLOW RATE				**0.00**	**137.50**	**275.00**	**412.50**	**550.00**	LPS
MUT [Reading]				0.00	137.62	274.63	412.17	548.84	LPS
MUT [Difference]				0.00	0.12	-0.37	-0.33	-1.16	LPS
MUT [% Error]				n/a	0.09	-0.13	-0.08	-0.21	% O.R
mA OUTPUT				**4.000**	**8.000**	**12.000**	**16.000**	**20.000**	mA
MUT [Reading]	min.	4	mA	3.997	7.999	11.987	15.976	19.965	mA
MUT [Difference]	max.	20	mA	-0.003	-0.001	-0.013	-0.024	-0.035	mA
MUT [% Error]				-0.08	-0.01	-0.11	-0.15	-0.18	% O.R
TOTALIZER - REF. FLOW RATE								**550.000**	LPS
TOTALIZER [MUT]								41	M3
TEST TIME								74.57	SECONDS
CALC. TOTALIZER								41.014	M3
ERROR								-0.03	%

COMMENTS

Note: was labelled FIT-203

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	E&H (FC)	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.08	PASS
mA OUTPUT	-0.10	PASS
TOTALIZER - R	-0.03	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.

SCG FLOWMETRIX

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER	Town of Orangeville
CONTACT	John den Hoed
	Supervisor, Wastewater Infrastructure Services
	16 Town Line, Orangeville, ON
	cell:(519) 939-8820
	E:jdenhoed@orangeville.ca

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Krohne
MODEL	IFC020D
SERIAL NUMBER	0412/04
FUSE	Pull Plug On Unit
PLANT ID	Orangeville STP
METER ID	Sludge Transfer Flow Meter
FIT ID	N/A
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183

VER. BY - FM Michael Jorrin / Paris Machuk

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

VERIFICATION DATE	November 18, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	100
F.S. FLOW - MAG	LPS	62.8
F.S. RANGE - O/P	LPS	50.000
CAL. k-FACTOR	GK	2.62490
Zero Offset Flow	LPS	-0.0100

FORWARD TOTALIZER INFORMATION

AS FOUND	426386	M3
AS LEFT	426411	M3
DIFFERENCE	25	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	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	6.3	12.5	25.1	62.8	% F.S. Range
REF. FLOW RATE				**-0.01**	**3.13**	**6.27**	**12.56**	**31.41**	LPS
MUT [Reading]				-0.24	2.98	6.44	12.28	33.26	LPS
MUT [Difference]				-0.23	-0.15	0.17	-0.28	1.85	LPS
MUT [% Error]				2300.00	-4.85	2.65	-2.21	5.89	%
mA OUTPUT				**4.000**	**5.002**	**6.008**	**8.018**	**14.051**	mA
MUT [Reading]	min.	4.000	mA	3.998	4.899	5.889	8.073	14.726	mA
MUT [Difference]	max.	20.000	mA	-0.002	-0.103	-0.119	0.055	0.675	mA
MUT [% Error]				-0.05	-2.06	-1.97	0.68	4.81	%
TOTALIZER - REF. FLOW RATE								**31.409**	LPS
TOTALIZER [MUT]								3	M3
TEST TIME								91.15	SECONDS
CALC. TOTALIZER								2.863	M3
ERROR								4.57	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	N/A

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.37	PASS
mA OUTPUT	0.28	PASS
TOTALIZER	4.57	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.

Flowmeter Calibration Verification Certificate

Customer	FIT-702
Date Performed	Wednesday 18 November 2020 11:37
Date Certificate Printed	Wednesday 18 November 2020 11:55

Site Details

Location	Orangeville WWTP
Tag	FIT-11
Operator	Paris Machuk

Results :

Transmitter Zero	Pass
Transmitter Span	Pass
Transmitter Pulse Output	Not Tested
Transmitter Analogue Output	Pass
Sensor Electrode Integrity	FAIL
Sensor Energising Coil Integrity	Pass

Declared "FULL" pipe status appears to be EMPTY.

Accuracy :

The meter has not passed calibration checks.

Export data using option on 'Review Tests' screen

and despatch to factory for helpline advice.

Transmitter Settings

Sensor Calibration Factor	0.9462/5/6/1.212
Flow Range	50.0 l/s
Response Time Constant	? seconds
Probe Factors	ins 1.00000, prof 1.00000
Analogue Output	4-20 Forward
Second Analogue Range	100.0% (50.0 l/s)
Pulse Output	Not Tested
Totaliser Units	m^3

Calmaster Details

Instrument, Serial No.	CM0149, V/40122/1/1
Last Calibrated	Tue 8 Sep 2020
Next Calibration Date	Wed 8 Sep 2021
Firmware Version	CalMaster v1.0 36/96
PC Software Version	v2.10 18/01/2000 (Intn.)
DVM Serial No.	
Resistor Serial No.	(Not Used)

Flowmeter Details

Type	MagMaster, Electromagnetic
Sensor S/No.	V/87510/1/1
Transmitter S/No.	vkh028917
Tag No.	FIT-11
Meter Size	100 mm

CalMaster is fully traceable to National and International Standards.
For details please refer to CalMaster Traceability Documentation.

ABB Instrumentation World Flow Technology Centres

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CALMASTER HELPLINE
Email : calmaster@gb.abb.com or calmaster@us.abb.com

ABB MAGMASTER
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER Town of Orangeville
CONTACT John den Hoed
Supervisor, Wastewater Infrastructure Services
16 Town Line, Orangeville, ON
cell:(519) 939-8820
E:jdenhoed@orangeville.ca

VER. BY - FM Paris Machuk

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	ABB
MODEL	MagMaster
CONVERTER SERIAL NUMBER	V/87510/3/5
FUSE	N/A
PLANT ID	Orangeville STP
METER ID	Supernatant Flow Meter
FIT ID	FIT-702
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 18, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	100
F.S. FLOW - MAG	LPS	74.3
F.S. RANGE - O/P	LPS	50.000
TUBE CAL. FACTOR	1	0.946190

FORWARD TOTALIZER INFORMATION

AS FOUND	0	M3
AS LEFT	6	M3
DIFFERENCE	6	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	**0.5**	**1.0**	**2.0**	**5.0**	**m/s**
				0	**5**	**10**	**20**	**50**	**% F.S. Flow**
				0.0	**7.4**	**14.9**	**29.7**	**74.3**	**% F.S. Range**
REF. FLOW RATE				**0.00**	**3.72**	**7.43**	**14.86**	**37.16**	LPS
MUT [Reading]				0.00	3.72	7.43	14.85	37.16	LPS
MUT [Difference]				0.00	0.00	0.00	-0.01	0.00	LPS
MUT [% Error]				n/a	0.12	-0.02	-0.09	0.01	%
mA OUTPUT				**4.000**	**5.189**	**6.378**	**8.756**	**15.890**	mA
MUT [Reading]	min.	4.000	mA	3.996	5.184	6.368	8.740	15.857	mA
MUT [Difference]	max.	20.000	mA	-0.004	-0.005	-0.010	-0.016	-0.033	mA
MUT [% Error]				-0.10	-0.10	-0.16	-0.18	-0.21	%
TOTALIZER - REF. FLOW RATE				**Enter in Totalizer Test Velocity if Different (m/s)**			5.0	**37.157**	LPS
TOTALIZER [MUT]								4	M3
TEST TIME								106.96	SECONDS
CALC. TOTALIZER								3.974	M3
ERROR								0.64	%

COMMENTS

Note: FIT number was updated was originally FIT-11

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.01	PASS
mA OUTPUT	-0.15	PASS
TOTALIZER	0.64	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.

Flowmeter Calibration Verification Certificate

Customer	Orangeville WWTP
Date Performed	Wednesday 18 November 2020 10:51
Date Certificate Printed	Wednesday 18 November 2020 11:29

Site Details

Location	Sludge loading/FIT-703
Tag	FIT-12
Operator	Paris Machuk

Results :

Transmitter Zero	Pass
Transmitter Span	Pass
Transmitter Pulse Output	Not Tested
Transmitter Analogue Output	Not Tested
Sensor Electrode Integrity	FAIL
Sensor Energising Coil Integrity	Pass

Declared "FULL" pipe status appears to be FULL.

Accuracy :

The meter has not passed calibration checks.

Export data using option on 'Review Tests' screen

and despatch to factory for helpline advice.

Transmitter Settings

Sensor Calibration Factor	0.9808/-13/6/1.545
Flow Range	50.0 l/s
Response Time Constant	? seconds
Probe Factors	ins 1.00000, prof 1.00000
Analogue Output	Not Tested
Second Analogue Range	Not Tested
Pulse Output	Not Tested
Totaliser Units	m^3

Calmaster Details

Instrument, Serial No.	CM0149, V/40122/1/1
Last Calibrated	Tue 8 Sep 2020
Next Calibration Date	Wed 8 Sep 2021
Firmware Version	CalMaster v1.0 36/96
PC Software Version	v2.10 18/01/2000 (Intn.)
DVM Serial No.	N/A
Resistor Serial No.	N/A

Flowmeter Details

Type	MagMaster, Electromagnetic
Sensor S/No.	V/87510/1/2
Transmitter S/No.	vkh028304
Tag No.	FIT-12
Meter Size	100 mm

CalMaster is fully traceable to National and International Standards.
For details please refer to CalMaster Traceability Documentation.

ABB Instrumentation World Flow Technology Centres

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Germany
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Fax +49 0551 905 777

CALMASTER HELPLINE
Email : calmaster@gb.abb.com or calmaster@us.abb.com

ABB MAGMASTER
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER Town of Orangeville
CONTACT John den Hoed
Supervisor, Wastewater Infrastructure Services
16 Town Line, Orangeville, ON
cell:(519) 939-8820
E:jdenhoed@orangeville.ca

VER. BY - FM Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	ABB
MODEL	MagMaster
CONVERTER SERIAL NUMBER	V/87510/3/1
FUSE	N/A
PLANT ID	Orangeville STP
METER ID	Sludge Loading Flow Meter
FIT ID	FIT-703
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 18, 2020
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2021

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	100
F.S. FLOW - MAG	LPS	77.0
F.S. RANGE - O/P	LPS	50.000
TUBE CAL. FACTOR	1	0.980890

FORWARD TOTALIZER INFORMATION

AS FOUND	-41	M3
AS LEFT	-33	M3
DIFFERENCE	8	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes

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

FLOW TUBE SIMULATION

				0.0	**0.5**	**1.0**	**2.0**	**5.0**	**m/s**
				0	**5**	**10**	**20**	**50**	**% F.S. Flow**
				0.0	**7.7**	**15.4**	**30.8**	**77.0**	**% F.S. Range**
REF. FLOW RATE				**0.000**	**3.852**	**7.704**	**15.408**	**38.519**	LPS
MUT [Reading]				0.000	3.847	7.701	15.412	38.549	LPS
MUT [Difference]				0.000	-0.005	-0.003	0.004	0.030	LPS
MUT [% Error]				n/a	-0.13	-0.04	0.03	0.08	%
mA OUTPUT				**4.000**	**5.233**	**6.465**	**8.930**	**16.326**	mA
MUT [Reading]	min.	4.000	mA	3.994	5.223	6.452	8.916	16.303	mA
MUT [Difference]	max.	20.000	mA	-0.006	-0.010	-0.013	-0.014	-0.023	mA
MUT [% Error]				-0.15	-0.18	-0.20	-0.16	-0.14	%
TOTALIZER - REF. FLOW RATE				**Enter in Totalizer Test Velocity if Different (m/s)**			5.0	**38.519**	LPS
TOTALIZER [MUT]								3	M3
TEST TIME								79.75	SECONDS
CALC. TOTALIZER								3.072	M3
ERROR								-2.40	%

COMMENTS

NOTE: originally FIT-12
Note: customer is experiancing shifting flows

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.02	PASS
mA OUTPUT	-0.17	PASS
TOTALIZER	-2.40	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.

REMOTE TOTALIZER
Verification Report

AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER Town of Orangeville
CONTACT Dean Soilleux
Waste Water Operator
16 Town LIne, Orangeville, ON
cell:(519) 938-6340
E:dsoilleux@orangeville.ca

VER. BY - FM Travis Krayetski

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Omeron
MODEL	H7EC
CONVERTER SERIAL NUMBER	N/A
FUSE	N/A
PLANT ID	Orangeville STP
METER ID	Remote Totalizer Display - Sludge Loading
FIT ID	N/A
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N43 55.120 W080 05.183
VERIFICATION DATE	November 20, 2019
CAL. FREQUENCY	Annual
CAL. DUE DATE	November, 2020

SOURCE INFORMATION

[MUT] MANUFACTURER		ABB
MODEL		MagMaster
CONVERTER SERIAL NUMBER		V/87510/3/1
PROCESS		Sludge Loading Flow Meter
EXPECTED FULL SCALE FLOW	l/s	38.519

TOTALIZER INFORMATION

AS FOUND	n/a	M3
AS LEFT	n/a	M3
DIFFERENCE	n/a	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED

TOTALIZER	yes

TOTALIZER - REF. FLOW RATE	**38.519**	l/s
TOTALIZER [MUT]	3	M3
TEST TIME	77.92	SECONDS
CALC. FLOW RATE	38.501	M3
ERROR	-0.05	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
STOP WATCH	SW	Yes

RESULTS

TEST	ERROR %	PASS FAIL
TOTALIZER	-0.05	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.

2088 Jetstream Road
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N5V 3P6
C: 519-870-FLOW (3569)
www.flowmetrix.ca

November 18, 2020

TOWN OF ORANGEVILLE
ORANGEVILLE - STP
16 TOWNLINE
ORANGEVILLE, ON, L9W 3T6
ATTENTION: JOHN DEN HOED

INFLUENT FLOW METER

Marsh McBirney
FloDar – Area/Velocity Flow Meter

UNIT SATUS: PASS

Totalizer
AS FOUND: 43756.83K m3
AS LEFT: n/a m3

AS FOUND

SETTINGS

Offset	1073 mm
Multiplier	1.4
Shape	Pipe
Full Area	2.2 m2
Cycle	5 minutes
Sample/Cycle	1

FIELD VERIFICATION

Level

Ultra. Offset mm	Manual Reference mm	MUT Reading mm	Error Reading % o.r.
1073	220	225.78	2.60
1073	300	319.14	6.38

NOTE: took about a 1.5 to 2 min to respond to level

Velocity

	Manual Reference m/s	MUT Reading m/s	Error Reading % o.r.
As Found	1.48	1.63	10.14
	1.49	1.59	6.71

NOTES:

1. Believe allowable error is +/- 15%
2. Changed out desiccant on units
3. MUT very slow to respond to level change as per above notation.
4. RECOMMEND: repair or replacement of unit.

Conducted by Paris Machuk and Michael Jorrin
[SCG-Flowmetrix Technical Services Inc.]

E+H Promag 400
HEARTBEAT
Verification Report

RESULTS

PASSED

CLIENT DETAIL	
CUSTOMER	Town of Orangeville
CONTACT	John den Hoed Supervisor, Wastewater Infrastructure Services 16 Town Line, Orangeville, ON cell:(519) 939-8820 E:jdenhoed@orangeville.ca
VER. BY - FM	Paris Machuk

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.

DEVICE INFORMATION	
[MUT] MANUFACTURER	Endress & Hauser
MODEL	Promag 400
CONVERTER SERIAL NUMBER	L6114E19000
ORDER CODE	5L4C1H-5LK7/0
PLANT ID	Oraneville WWTP
METER ID	Waste Flow
FIT ID	FIT-304
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	N/A
VERIFICATION DATE	November 20th 2019
CAL. FREQUENCY	Annual
CAL. DUE DATE	November 2020

CALIBRATION		
DIAMETER (DN)	mm	100
CALIBRATION FACTOR		1.3424
ZERO POINT		-8

TOTALIZER		
AS FOUND	482595.28	M3
AS LEFT	482595.28	M3
DIFFERENCE	0	M3

VERIFICATION INFORMATION		
OPERATING TIME (d/h/m/s)	d	1428
	h	14
	m	59
	s	8
DATE/TIME	date (dd.mm.yy)	18.11.20
	time (hh:mm)	08:21
VERIFICATION ID		3

COMPONENTS TESTED	
SENSOR - Coil Current Shot Time	yes
SENSOR - Coil Hold Voltage	yes
SENSOR - Coil Current	yes
SENSOR - Electrode Reference Voltage	yes
SENSOR - Linearity Electrode Circuit	yes
SENSOR - Offset Electrode Circuitry	yes
I/O Module	yes

OVERALL VERIFICATION	**PASSED**
SENSOR	**PASSED**
Coil Current Shot Time	PASSED
Coil Hold Voltage	PASSED
Coil Current	PASSED
SENSOR ELECTRONIC MODULE	**PASSED**
Reference Voltage	PASSED
Linearity of Electrode Measuring Circuit	PASSED
Offset of Electrode Measuring Circuit	PASSED
SENSOR ELECTRONIC MODULE	**PASSED**
Reference Voltage	PASSED

COMMENTS

This report reflects the results based on the manufacturers HEARTBEAT diagnostic technology for flow meter verification for all Prosonic 400 series meters with an
active HEARTBEAT.