Merrickville Wastewater System

2021 Annual Report

January 1, 2021 – December 31, 2021

Prepared By

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared to meet the requirements set out in the facility Certificate of Approval #1121-7YRQLF issued January 18, 2010.

Contents

Compliance Report Card

Compliance Event	# of Events	Details
Ministry of Environment Inspections	0	No Inspection's during the reporting period
Ministry of Labour Inspections	0	No Inspection's during the reporting period
Effluent Parameter Exceedances	1	Phosphorus exceeded the regulatory limit in February 2021
Bypass/Overflows	0	No Bypass or Overflows to report for this reporting period
Community Complaints	0	No community complaints during the reporting period
Spills	1	1 spill during the reporting period

System/Process Description

The Merrickville Wastewater system utilizes an ISAM treatment system. This system incorporates a surge/anoxic mix tank as part of the tank to optimally control the process and provides rapid and complete treatment. The surge tank provides flow and nutrient equalization to optimally provide treatment at the full range of flows and loadings.

The secondary treatment process employs sequencing batch reactor (SBR) technology consisting of anaerobic tanks, anoxic tanks and a sequencing batch reactor. The Sequencing Batch Reactor incorporates an anaerobic selector chamber which provides consistent phosphorous removal by subjecting the recirculated biomass to anaerobic conditions, forcing the release of phosphorous, but also creates soluble carbon as a food source for phosphorous removal through anaerobic conversion of settle able BOD to soluble carbon. Additionally, anaerobic sludge digestion occurs in the anaerobic selector chamber, reducing waste solids production by up to 65% for the entire secondary process. Effluent is disinfected using Ultraviolet disinfection. Permanent Diesel generator is on-site to provide back-up power.

Proposed Alterations, Extensions, or Replacement to Works

There are no proposed alterations, extensions or replacements that would affect the Certificate of Approval.

Effluent Quality Assurance or Control Measures

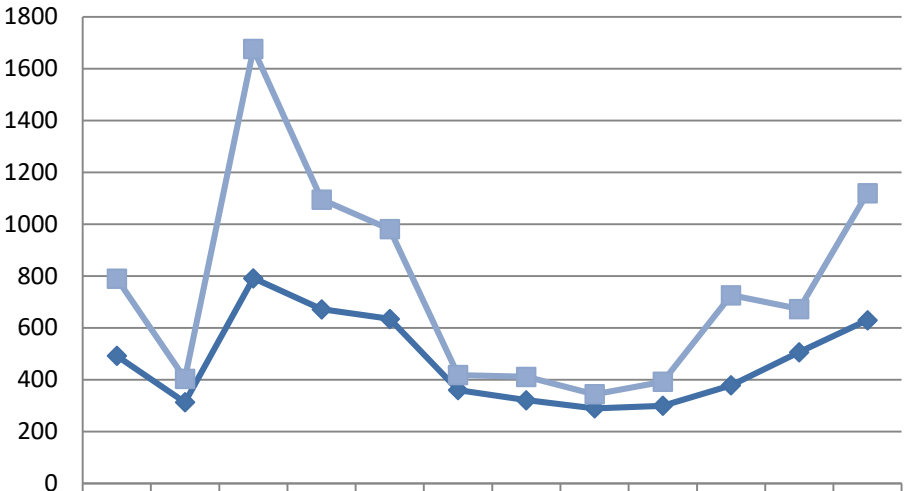
The Village of Merrickville-Wolford facilities are part of OCWA's operational Mississippi Cluster. The facilities are supported by cluster, regional and corporate resources. Operational Services are delivered by OCWA staff that live and work in the community.
OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.
OCWA has additional "Value Added" and operational support services that the Village of Merrickville-Wolford benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
    - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
    - Process Data Collection (PDC) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
    - Work Management System (WMS) that tracks and reports maintenance activity, and creates predictive and preventative reports.
    - Outpost 5 wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

Treatment Flows

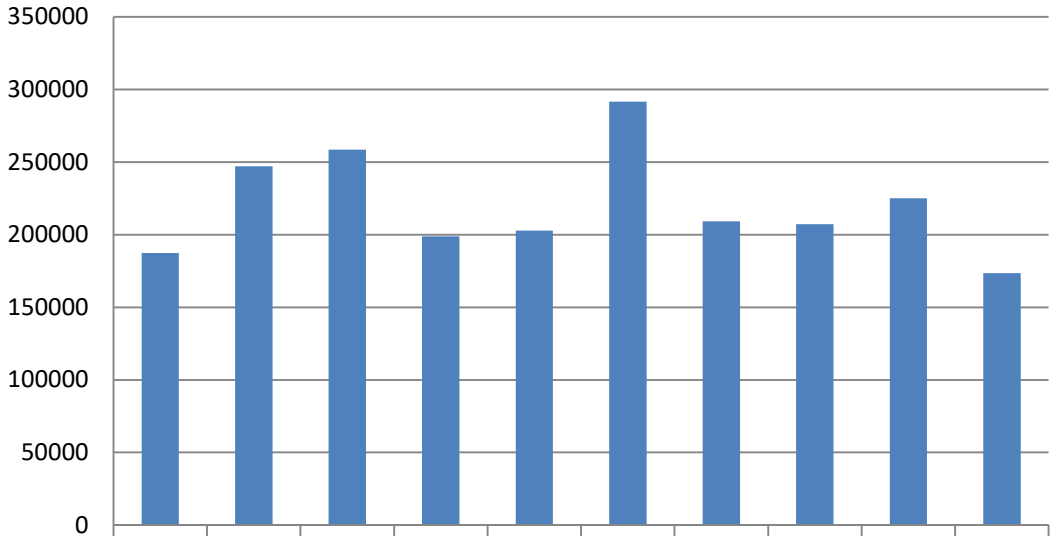
Raw Flow (m³/d)

Annual average flow for 2021 was 475.4 m³/d. The Average daily flow rated capacity is 800 m³/d. This is based on an annual average. A flow reduction plan was established for 2018.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily Flow (m³/d)	492	313	791	671	635	360	321	290	299	378	507	630
Max Daily Flow (m³/d)	790	404	1676	1095	981	418	411	344	392	726	673	1120

Annual Comparison (m³)



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Annual Flow	187340	247235	258709	198948	202822	291715	209152	207174	225043	173530

Septage Volumes

Month	Septage Received (m^3)
March	9.6
April	16.3
May	14.0
June	17.7
July	19.6
August	14.8
September	13.2
October	14.8

Raw Sewage Quality

Results of raw sewage concentrations and loadings are available in the Facility Performance Assessment Report in Appendix A.

Effluent Quality

The limits are based on current requirements in the facilities Environmental Compliance Approval. Laboratory samples are submitted to an accredited laboratory for regulatory analysis.

The Federal Government also regulates certain sewage effluent parameter under the Federal Fisheries Act. The results are submitted to Environment Canada (WESR) on a quarterly basis.

Effluent Exceedance Summary Limit

Sample	Date	Parameter	Exceedance of	Limit	Value
Final Effluent	February 2021	Phosphorus	Regulatory Limit	0.63 mg/L	0.68 mg/L

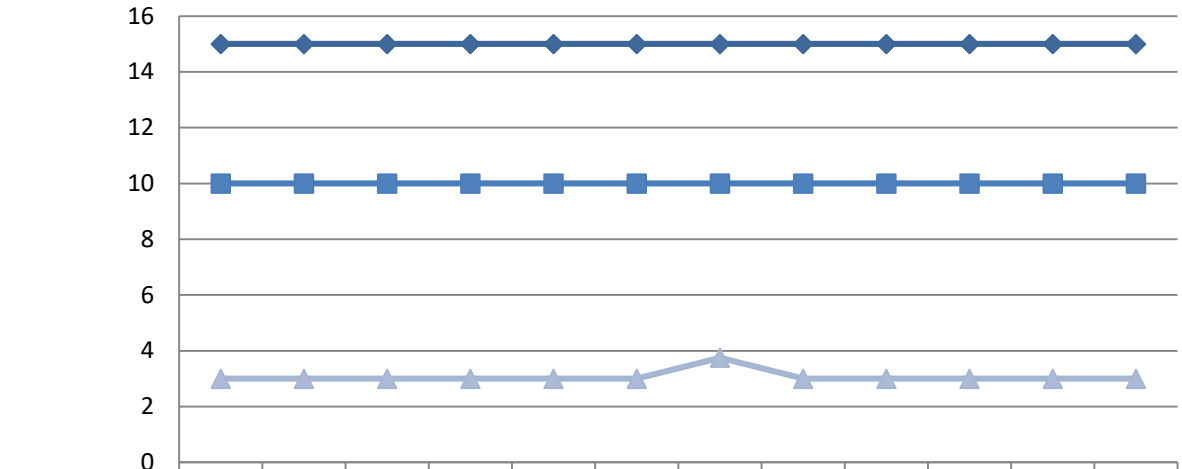
Other Issues

There were no other issues during the reporting year.

Effluent Parameter Summary

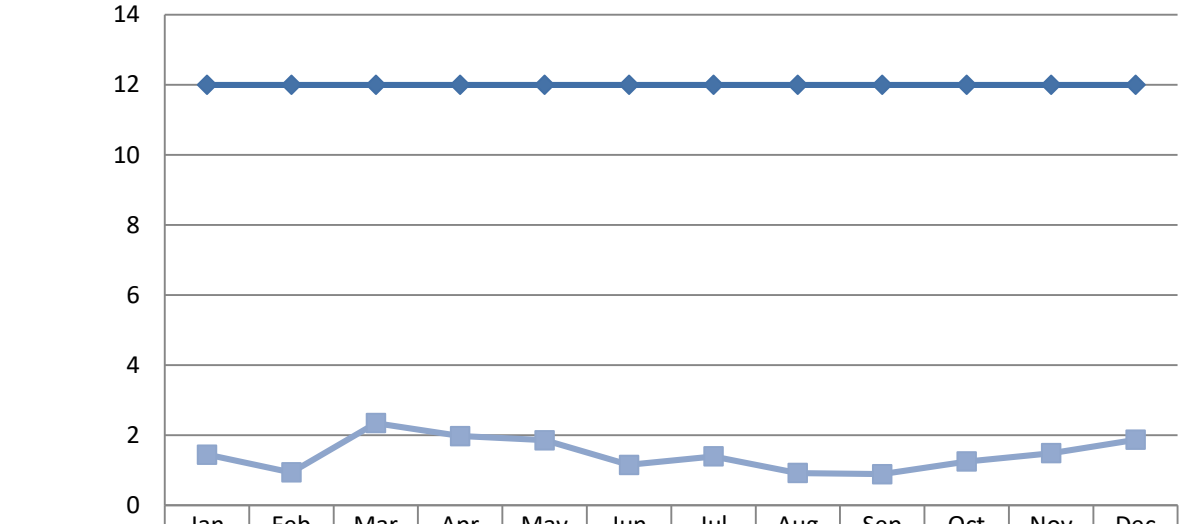
Carbonaceous Biological Oxygen Demand (CBOD5)

Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	15	15	15	15	15	15	15	15	15	15	15	15
Objective	10	10	10	10	10	10	10	10	10	10	10	10
Average	3	3	3	3	3	3	4	3	3	3	3	3

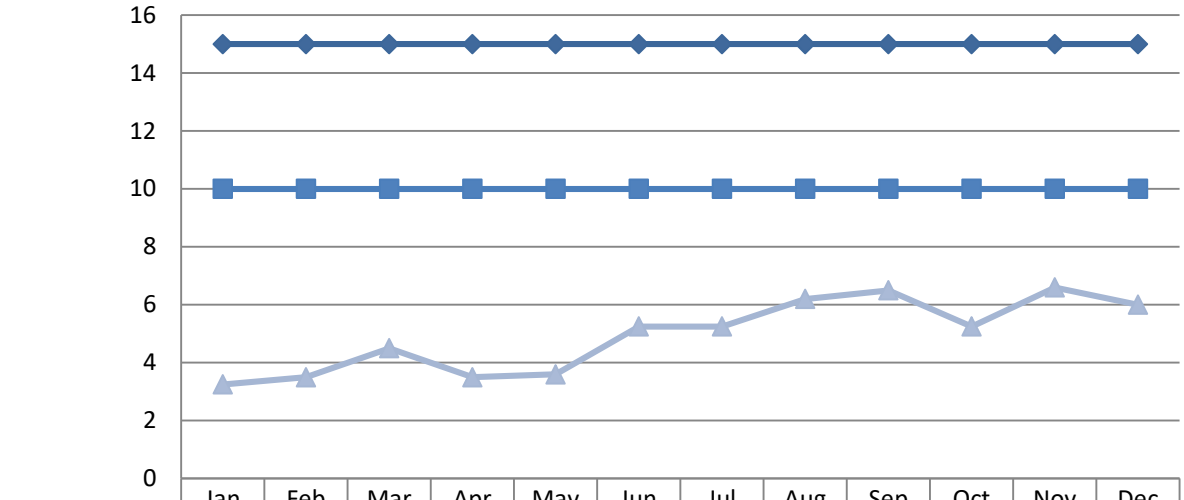
Loading (kg/d)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	12	12	12	12	12	12	12	12	12	12	12	12
Average	1.448	0.942	2.346	1.975	1.859	1.154	1.396	0.922	0.892	1.251	1.487	1.872

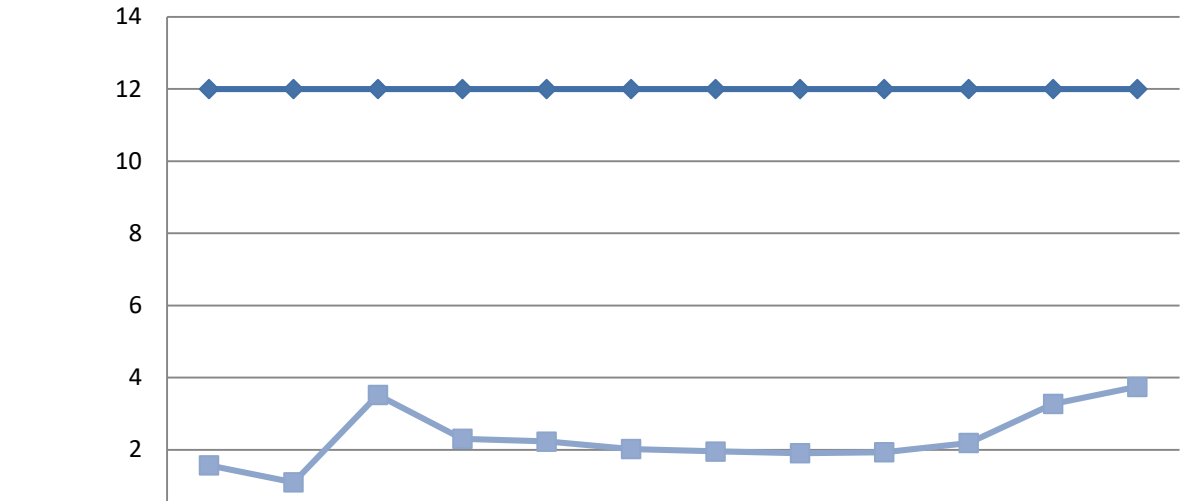
Total Suspended Solids

Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	15	15	15	15	15	15	15	15	15	15	15	15
Objective	10	10	10	10	10	10	10	10	10	10	10	10
Average	3.3	3.5	4.5	3.5	3.6	5.3	5.3	6.2	6.5	5.3	6.6	6.0

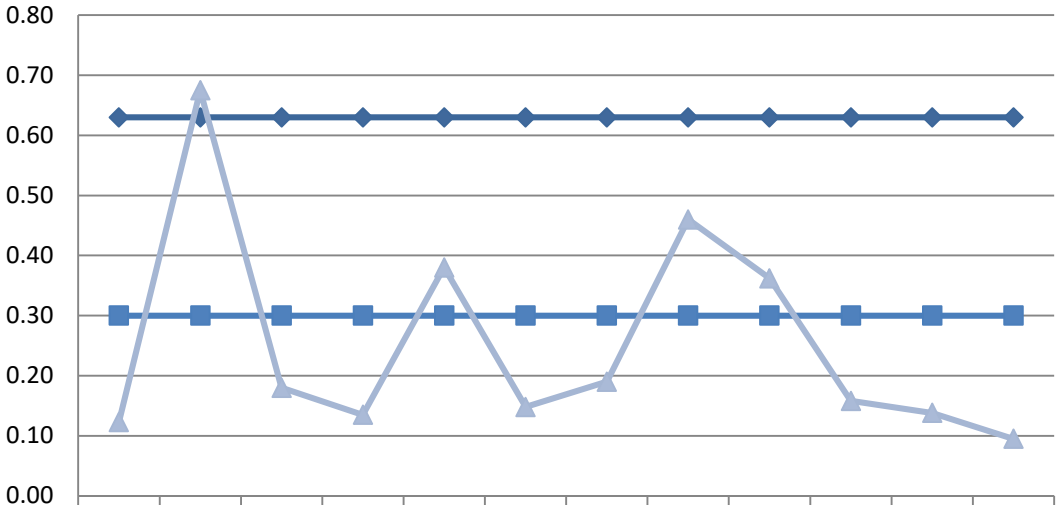
Loading (kg/d)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	12	12	12	12	12	12	12	12	12	12	12	12
Average	1.6	1.1	3.5	2.3	2.2	2.0	2.0	1.9	1.9	2.2	3.3	3.7

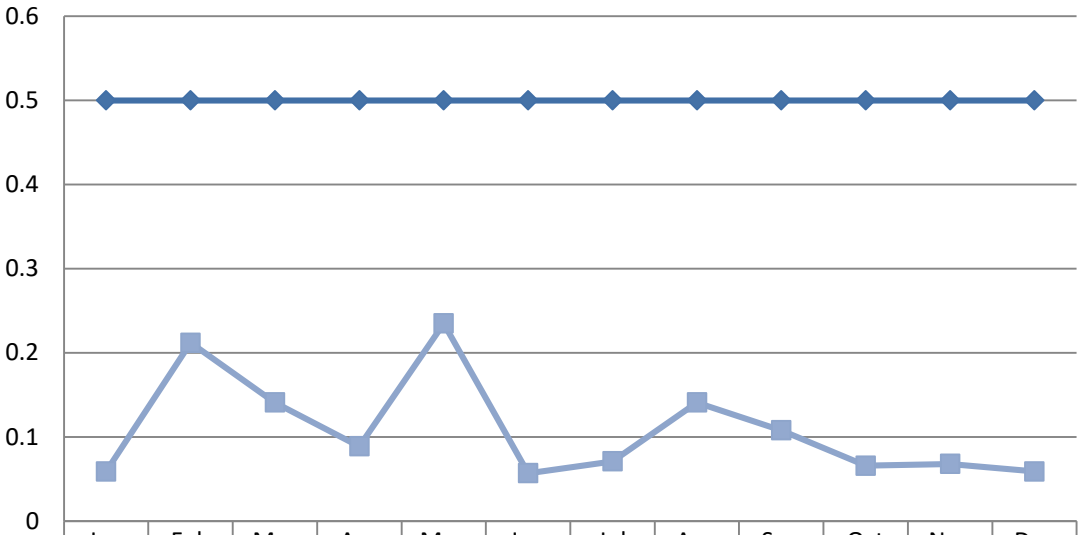
Total Phosphorus

Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Objective	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Average	0.12	0.68	0.18	0.14	0.38	0.15	0.19	0.46	0.36	0.16	0.14	0.10

Loading (kg/d)

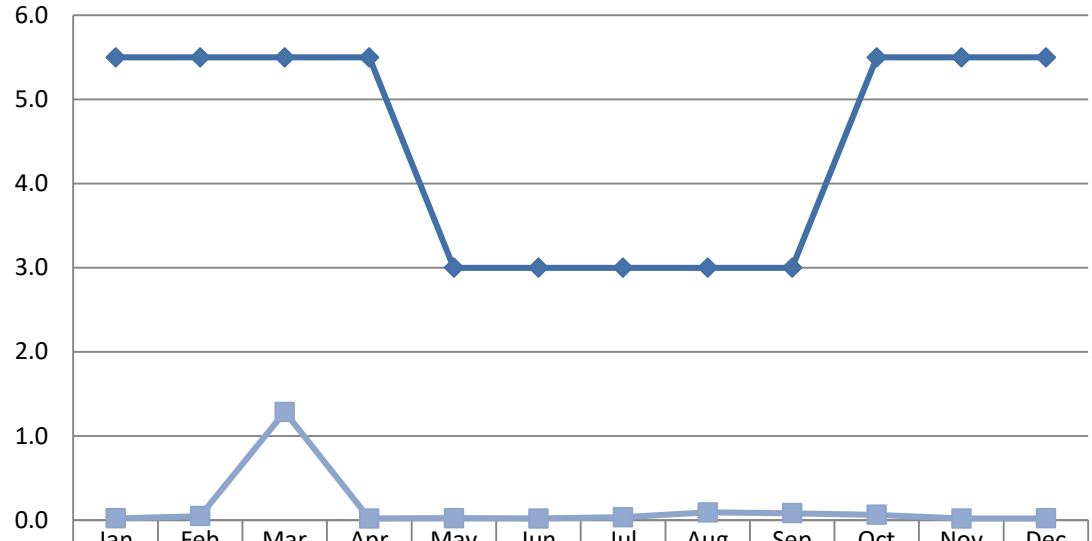


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Average	0.059	0.212	0.141	0.089	0.235	0.057	0.071	0.141	0.108	0.066	0.068	0.059

Total Ammonia Nitrogen

Limit is based on effluent being "Non-Acutely Lethal". See Acute Lethality results below.

Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Objective	5.5	5.5	5.5	5.5	3.0	3.0	3.0	3.0	3.0	5.5	5.5	5.5
Average	0.02	0.05	1.29	0.02	0.02	0.02	0.04	0.09	0.08	0.07	0.02	0.02

Acute Lethality

Semi-Annual sampling is required for acute lethality (Rainbow Trout and Daphnia Magna). Results are displayed as % mortality.

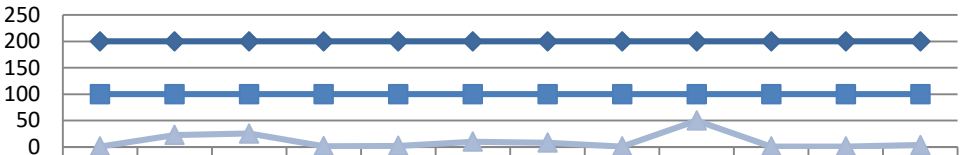
Date	Rainbow Trout	Daphnia Magna
April 20-2021	0%	0%
September 15, 2021	0%	0%

E-coli

SBR1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	200	200	200	200	200	200	200	200	200	200	200	200
Objective	100	100	100	100	100	100	100	100	100	100	100	100
Geometric Mean Avg	3.68	1.00	2.00	1.00	1.44	6.00	24.08	2.00	1.00	1.82	2.89	5.29

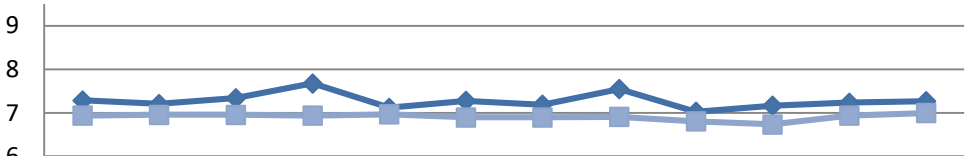
SBR2



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	200	200	200	200	200	200	200	200	200	200	200	200
Objective	100	100	100	100	100	100	100	100	100	100	100	100
Geometric Mean Avg	1.00	22.54	25.39	1.44	2.03	10.00	8.00	1.00	50.00	1.00	1.00	3.61

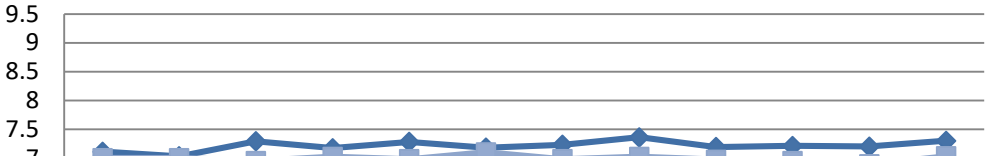
pH

SBR 1



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Monthly pH	7.29	7.21	7.34	7.68	7.12	7.28	7.19	7.55	7.03	7.17	7.24	7.27
Min Monthly pH	6.94	6.96	6.96	6.94	6.97	6.9	6.9	6.91	6.81	6.74	6.94	7.00

SBR 2



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Monthly pH	7.11	7.03	7.29	7.17	7.28	7.18	7.23	7.36	7.19	7.21	7.20	7.30
Min Monthly pH	7.00	7.00	6.95	7.02	6.98	7.10	6.98	7.02	6.97	6.95	6.89	7.03

Biosolids

Sludge generated from the treatment plant was spread on agricultural land during the spreading season as per the Nutrient Management Act O.Reg 267/03. During the winter sludge is stored on-site until the Organic Soil Conditioning Sites are available for spreading.

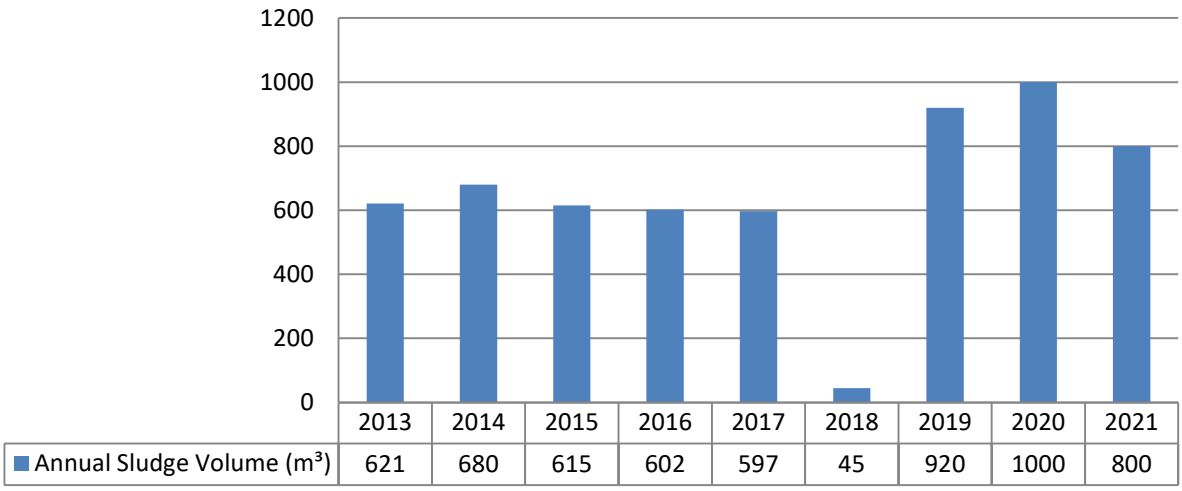
During the spreading season the operating authority contracts sludge haulage. Sludge haulage is contracted to Terrapure Environmental who maintains a bank of available sites for disposal of biosolids. Biosolids quality report in Appendix B.

Biosolids Disposal Summary

For 2021, Terrapure hauled 800 m³ from the sludge holding tank.

Date	Site	NASM Plan number	Volume (m³)
May 7-18 2021	Sunol Farms – Turner Farm	24589	800
			800

Annual Comparison



Note: In 2018, extremely wet weather conditions resulted in limited hauling opportunities.

Summary of Complaints

The following were received community complaints related to the operations of the Merrickville WPCP and Collection System.

Date	Location	Details	Corrective Action Taken
There were no Community Complaints during the reporting period.			

Summary of Bypass/Overflows

Date	Location	Details	Corrective Action Taken
There were no Bypass' or Overflows during the reporting period.			

Summary of Spills/Abnormal Discharges

Date	Location	Details	Corrective Action Taken
March 12 2021	St. Lawrence Street	Blocked sanitary sewer	The spill was disinfected using chlorine upstream of the storm sewer and dechlorination was used before it entered the storm sewer

Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports. The Eastern Regional Hub has specialized certified staff such as Millwrights, Electricians and Instrumentation Specialists to name a few.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the Village of Merrickville-Wolford in the form of a "Capital Forecast". This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

Maintenance Highlights

WO #	Summary
2094235	Capital Raw sewage pump repair
2094244	Capital collection system flushing and camera
2094252	Capital Replacement UV bulbs bank A
2094254	Capital Tools replacement
2094258	Capital Jersey barrier parking lot

WO #	Summary
2094259	Capital Service Entrance fence and gate
2090874	Capital reroute wire for septage pumps
2091337	Capital UV bank B led light failure
2092866	Capital Electrical Outlets
2092873	Capital Electrical work for pressure washer
2131836	Capital Disconnect plug chemical pump
2132146	Capital Install trip guard septage tank
2360581	Capital TSSA Inspection Fuel Tanks X3
2361991	Capital Surge protector module generator building
2405079	Capital UV parts repair
2452175	Capital Abs blower #2 repairs
2503240	Capital UPS replacement
2177182	Capital Emergency sewage blockage
2177344	Capital Infiltration control supplies and labor
2223393	Capital Surge protectors for STP and SPS
2225055	Capital Combo vac truck work
2225781	Capital Gas Heaters and Backflow preventers
2225785	Capital SCADA/plc communication failure
2266257	Capital Generator Frost plug leak
2268652	Capital Flowmeter Annual Calibration
2361762	Capital Lifting equipment repairs
2361989	Capital Digester pump failure / electrical work
2363128	Capital Chemical tank repair
2407190	Capital Blower cooling fan replacement motor
2453048	Capital Repair faulty UV boards
2503717	Capital Security camera and lights

Calibration

The flow meters were calibrated on May 19, 2021. Calibration Reports are attached in Appendix C.
There is no on-line effluent monitoring equipment installed at this facility.

Appendix A

Facility Performance Assessment Report

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

From: **01/01/2021 to 31/12/2021**

Facility: **[1162] MERRICKVILLE WASTEWATER TREATMENT FACILITY**
Works: **[110001729]**

	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	<--Total-->	<--Avg.-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Raw Sewage (m^3)	15261.00	8773.00	24531.00	20142.00	19671.00	10791.00	9961.00	8976.00	8980.00	11730.00	15195.00	19519.00	173530.00			
Raw Flow: Avg - Raw Sewage (m^3/d)	492.29	313.32	791.32	671.40	634.55	359.70	321.32	289.55	299.33	378.39	506.50	629.65		473.94		
Raw Flow: Max - Raw Sewage (m^3/d)	790.00	404.00	1676.00	1095.00	981.00	418.00	411.00	344.00	392.00	726.00	673.00	1120.00			1676.00	
Eff. Flow: Total - Final Effluent (m^3)	14964.00	8788.00	24244.00	19748.00	19210.00	11543.00	11540.00	9525.00	8922.00	12924.00	14865.00	19342.00	175615.00			
Eff. Flow: Avg - Final Effluent (m^3/d)	482.71	313.86	782.06	658.27	619.68	384.77	372.26	307.26	297.40	416.90	495.50	623.94		479.55		
Eff. Flow: Max - Final Effluent (m^3/d)	799.00	403.00	1665.00	1064.00	981.00	507.00	501.00	411.00	408.00	707.00	675.00	1103.00			1665.00	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Eff: Avg cBOD5 - Final Effluent (mg/L)	< 3.000	< 3.000	< 3.000	< 3.000	< 3.000	< 3.000	< 3.750	< 3.000	< 3.000	< 3.000	< 3.000	< 3.000		< 3.063	< 3.750	15.0
Eff: # of samples of cBOD5 - Final Effluent (mg/L)	4	4	6	4	5	4	4	5	4	4	5	4	53			
Loading: cBOD5 - Final Effluent (kg/d)	< 1.448	< 0.942	< 2.346	< 1.975	< 1.859	< 1.154	< 1.396	< 0.922	< 0.892	< 1.251	< 1.487	< 1.872		< 1.462	< 2.346	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw Sewage (mg/L)	96.000	223.000	159.000	80.000	71.000	134.000	235.000	216.000	213.000	152.000	97.000	112.000		149.000	235.000	
Raw: # of samples of BOD5 - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw Sewage (mg/L)	150.000	330.000	310.000	124.000	86.000	176.000	236.000	255.000	255.000	220.000	120.000	162.000		202.000	330.000	
Raw: # of samples of TSS - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TSS - Final Effluent (mg/L)	< 3.250	< 3.500	< 4.500	< 3.500	< 3.600	< 5.250	< 5.250	< 6.200	< 6.500	< 5.250	6.600	< 6.000		< 4.950	6.600	15.0
Eff: # of samples of TSS - Final Effluent (mg/L)	4	4	6	4	5	4	4	5	4	4	5	4	53			
Loading: TSS - Final Effluent (kg/d)	< 1.569	< 1.099	< 3.519	< 2.304	< 2.231	< 2.020	< 1.954	< 1.905	< 1.933	< 2.189	3.270	< 3.744		< 2.311	3.744	
Percent Removal: TSS - Raw Sewage (mg/L)	97.833	98.939	98.548	97.177	95.814	97.017	97.775	97.569	97.451	97.614	94.500	96.296			98.939	
Total Phosphorus: TP:																
Raw: Avg TP - Raw Sewage (mg/L)	3.200	7.560	6.530	2.490	1.980	4.420	6.720	5.790	5.640	6.360	3.050	3.260		4.750	7.560	
Raw: # of samples of TP - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TP - Final Effluent (mg/L)	0.123	0.675	0.180	0.135	< 0.380	0.148	0.190	0.460	0.362	0.158	0.138	0.095		< 0.254	0.675	0.63
Eff: # of samples of TP - Final Effluent (mg/L)	4	4	6	4	5	4	4	5	4	4	5	4	53			
Loading: TP - Final Effluent (kg/d)	0.059	0.212	0.141	0.089	< 0.235	0.057	0.071	0.141	0.108	0.066	0.068	0.059		< 0.109	0.235	
Percent Removal: TP - Raw Sewage (mg/L)	96.172	91.071	97.243	94.578	80.808	96.663	97.173	92.055	93.573	97.524	95.475	97.086			97.524	
Nitrogen Series:																
Raw: Avg TKN - Raw Sewage (mg/L)	24.600	51.600	44.600	17.800	13.500	30.500	51.500	45.300	42.000	56.600	24.000	21.900		35.325	56.600	
Raw: # of samples of TKN - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12			
Eff: Avg TAN - Final Effluent (mg/L)	< 0.023	0.050	< 1.287	0.020	0.024	0.020	0.035	< 0.093	0.083	0.065	< 0.020	< 0.023		< 0.145	1.287	
Eff: # of samples of TAN - Final Effluent (mg/L)	4	4	6	4	5	4	4	4	4	4	5	4	52			
Loading: TAN - Final Effluent (kg/d)	< 0.011	0.016	< 1.006	0.013	0.015	0.008	0.013	< 0.028	0.025	0.027	< 0.010	< 0.014		< 0.099	1.006	
Disinfection:																
Eff: GMD E. Coli - Eff SBR2 (cfu/100mL)	1.000	22.539	25.391	1.442	2.031	10.000	8.000	1.000	50.000	1.000	1.000	3.606		10.584	50.000	
Eff: GMD E. Coli - Eff SBR1 (cfu/100mL)	3.684	1.000	2.000	1.000	1.442	6.000	24.083	2.000	1.000	1.817	2.893	5.292		4.351	24.083	
Eff: # of samples of E. Coli - Eff SBR2 (cfu/100mL)	2	2	6	3	4	1	1	2	1	1	1	2	26			
Eff: # of samples of E. Coli - Eff SBR1 (cfu/100mL)	3	2	3	3	3	1	2	1	2	3	4	2	29			

Appendix B

Biosolids Quality Report

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: AEROBIC
Solids and Nutrients

Facility: MERRICKVILLE WASTEWATER TREATMENT FACILITY
Works: 1162
Period: 01/01/2021 to 12/01/2021

Facility Works Number: *1.10001729E8*
Facility Name: *MERRICKVILLE WASTEWATER TREATMENT FACILITY*
Facility Owner: *Municipality: The Village of Merrickville-Wolford*
Facility Classification: *Class 2 Wastewater Treatment*
Receiver: *Rideau River*
Service Population:
Total Design Capacity: *m3/day*
Period Being Reported: 01/01/2021 12/01/2021

Note: all parameters in this report will be derived from the Bslq Station

Month	Total Sludge Hauled (m3)	Avg. Total Solids (mg/L)	Avg. Volatile Solids (mg/L)	Avg. Total Phosphorus (mg/L)	Ammonia (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	TKN (mg/L)	Ammonia + Nitrate (mg/L)	Potassium (mg/L)
Site	**MERRICKVILLE WASTEWATER TREATMENT FACILITY**									
Station	**Bslq Station only**									
Parameter Short Name	**HauledVol**	**TS**	**VS**	**TP**	**NH3p_NH4p_N**	**NO3-N**	**NO2-N**	**TKN**	**calculation in report - no T/S**	**K**
T/s	**IH Month.Total**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**		**Lab Published Month Mean**
Jan		54,600.000	35,400.000	1,360.000	431.000	1.000	1.000	2,540.000	216.000	41.700
Feb		60,400.000	37,600.000	1,020.000	272.000	0.100	0.100	1,880.000	136.050	41.400
Mar		56,300.000	35,200.000	2,330.000	259.000	0.100	0.100	4,350.000	129.550	41.600
Apr		62,800.000	39,200.000	1,160.000	262.000	1.000	1.000	2,100.000	131.500	54.000
May	801.000	41,950.000	24,900.000	982.500	319.000	1.200	0.550	1,965.000	160.100	36.100
Jun										
Jul										
Aug		34,700.000	25,000.000	784.000	196.000	1.000	1.000	1,560.000	98.500	38.200
Sep		46,300.000	26,600.000	1,130.000	333.000	1.000	1.000	1,800.000	167.000	40.500

Oct		49,500.000	29,700.000	770.000	269.000	1.000	1.000	1,140.000	135.000	42.700
Nov										
Dec		51,500.000	31,900.000	1,110.000	202.000	0.100	0.100	1,880.000	101.050	46.000
Average	801.000	50,894.444	31,722.222	1,182.944	282.556	0.722	0.650	2,135.000	141.639	42.467
Total	801.000	458,050.000	285,500.000	10,646.500	2,543.000	6.500	5.850	19,215.000	1,274.750	382.200

Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digestor Type: AEROBIC
Metals and Criteria

Facility: MERRICKVILLE WASTEWATER TREATMENT FACILITY
Works: 1162
Period: 01/01/2021 to 12/01/2021

Note: all parameters in this report will be derived from the Bslq Station

Month	Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Lead (mg/L)	Selenium (mg/L)	Zinc (mg/L)
Site	**MERRICKVILLE WASTEWATER TREATMENT FACILITY**										
Station	**Bslq Station only**										
Parameter Short Name	**As**	**Cd**	**Co**	**Cr**	**Cu**	**Hg**	**Mo**	**Ni**	**Pb**	**Se**	**Zn**
T/s	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**	**Lab Published Month Mean**
Jan	0.100	0.060	0.170	1.000	30.700	0.032	0.600	1.170	1.300	0.300	46.000
Feb	0.200	0.080	0.230	1.190	33.700	0.030	0.690	1.360	1.300	0.300	54.000
Mar	0.100	0.040	0.150	0.860	23.000	0.022	0.470	1.100	0.900	0.200	36.900
Apr	0.200	0.060	0.230	1.130	34.000	0.028	0.660	1.530	1.400	0.300	51.500
May	0.100	0.045	0.095	0.740	20.650	0.016	0.400	0.885	1.350	0.200	30.400
Jun											
Jul											
Aug	0.100	0.060	0.160	0.790	21.600	0.016	0.400	0.810	0.900	0.200	33.400
Sep	0.100	0.050	0.260	1.130	34.100	0.023	0.640	1.360	1.400	0.300	51.900
Oct	0.200	0.150	0.250	1.320	41.400	0.021	0.810	2.340	1.700	0.300	63.800
Nov											
Dec	0.100	0.090	0.440	1.270	39.300	0.025	0.790	2.000	1.500	0.100	65.500
Average	0.133	0.071	0.221	1.048	30.939	0.024	0.607	1.395	1.306	0.244	48.156
Max. Permissible Metal Concentrations (mg/kg of Solids)	170.000	34.000	340.000	2,800.000	1,700.000	11.000	94.000	420.000	1,100.000	34.000	4,200.000
Metal Concentrations in Sludge (mg/kg)	2.620	1.386	4.334	20.587	607.903	0.465	11.920	27.410	25.652	4.803	946.185

Ontario Clean Water Agency
Biosolids Quality Report - Liquid - Based on Last 4 Samples
Digestor Type: AEROBIC

Facility: MERRICKVILLE WASTEWATER TREATMENT FACILITY
Works: 1162
Period: 01/01/2021 to 12/01/2021

Note: all parameters in this report will be derived from the Bslq Station

Parameter Short Name	Time Series	08/16/2021	09/20/2021	10/18/2021	12/06/2021	Average	Metal Concentrations in Sludge (mg/kg):	Max. Permissible Metal Concentrations (mg/kg of Solids):
As (mg/L)	Lab Published	0.100	0.100	0.200	0.100	0.125	2.747	170
Cd (mg/L)	Lab Published	0.060	0.050	0.150	0.090	0.088	1.934	34
Co (mg/L)	Lab Published	0.160	0.260	0.250	0.440	0.277	6.088	340
Cr (mg/L)	Lab Published	0.790	1.130	1.320	1.270	1.128	24.791	2800
Cu (mg/L)	Lab Published	21.600	34.100	41.400	39.300	34.100	749.451	1700
Hg (mg/L)	Lab Published	0.016	0.023	0.021	0.025	0.021	0.462	11
Mo (mg/L)	Lab Published	0.400	0.640	0.810	0.790	0.660	14.505	94
Ni (mg/L)	Lab Published	0.810	1.360	2.340	2.000	1.627	35.758	420
Pb (mg/L)	Lab Published	0.900	1.400	1.700	1.500	1.375	30.220	1100
Se (mg/L)	Lab Published	0.200	0.300	0.300	0.100	0.225	4.945	34
Zn (mg/L)	Lab Published	33.400	51.900	63.800	65.500	53.650	1,179.121	4200
E. Coli: Dry Wt (cfu/g)	Lab Published						E.Coli average is the GMD	
TS (mg/L)	Lab Published	34,700.000	46,300.000	49,500.000	51,500.000	45,500.000		
VS (mg/L)	Lab Published	25,000.000	26,600.000	29,700.000	31,900.000	28,300.000		
TP (mg/L)	Lab Published	784.000	1,130.000	770.000	1,110.000	948.500		
NO2-N (mg/L)	Lab Published	1.000	1.000	1.000	0.100	0.775		
TKN (mg/L)	Lab Published	1,560.000	1,800.000	1,140.000	1,880.000	1,595.000		
K (mg/L)	Lab Published	38.200	40.500	42.700	46.000	41.850		
NH3p_NH4p_N (mg/L)	Lab Published	196.000	333.000	269.000	202.000	250.000		
NO3-N (mg/L)	Lab Published	1.000	1.000	1.000	0.100	0.775		

Appendix C

Flow Meter Calibration Records

CapitalControls
Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

10-830 Industrial Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

Town of Merrickville

Calibration of Waste Water Flow Meters

Report May 19 2021

Prepared For: O.C.W.A. Merrickville

Calibration Date: May 19th 2021

Calibration Due: May 19th 2022

Verifications performed by: Tim Stewart

Report prepared by: Tim Stewart

CapitalControls
Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

10-830 Industrial Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

Table of Contents

10-830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

1 List of Verified Devices

This letter is to confirm that annual verification on the following devices has been completed.

ID	Process	Make/Model	Results
FIT-701	Sludge	E and H / Promag 53 W	Passed
FIT-402	Final Effluent	E and H / Promag 53 W	Passed
FIT-501	Septage/Supernatant	E and H / Promag 53 W	Passed
FIT-305	Raw Sewage	E and H / Promag 53 W	Passed

2 Equipment Used

The following equipment was used to perform the calibrations:

E and H Fieldcheck

3 Procedures Used

To verify the equipment standard verification procedures developped by the Township were used and standard industry practice.

3.1 Flowmeter Verification

Verification, Magnetic Flow Meter:

The verification of Endress & Hauser Flow measuring devices (the device under test) are checked for the following characteristic values:

1. Functionality and deviation in flow measurement.

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2. Deviation in the current and frequency outputs in reference to the flow rate data determined by the measuring device.

Measuring devices: The verification system consists of the FlowCheck flow simulator, the Simubox and the appropriate connection cables.

FieldCheck: The FieldCheck flow simulator generates the flow simulation signals and processes the measured values sent back from the transmitter.

Simubox: The Simubox ensures that the FieldCheck simulation signal are correctly converted in the transmitter, by comparing the measurements returned from the transmitter to data stored within the Simubox for various parameters (Electromagnetic Field vs. Flow, Flow vs. Current, and various other parameters important in verifying the proper functionally of the device under test.

4 Instrument Verification

See the following pages of reports for individual equipment.

CapitalControls
Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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4.1 FIT 701 Sludge Flow

Flow Transmitter
As Found Results

Instrument Calibration/Verification Report

Date: May 19 , 2021

Client Details

Customer	O.C.W.A. Merrickville
Contact	Jeff Morrison
	613-257-9223
Calibrations by:	Tim Stewart
	Capital Controls
	613-248-1999

Instrument Details

Manufacturer	Eand H
Model	Promag 53 DN 100
Serial Number	KF081F16000
Location	W.W.T.P.
Process	Sludge
Tag ID	FIT-701
Output	4-20 mA

Calibration Equipment

Make	Fluke Meter	FieldCheck
Model	725	50098801
Serial #	8759025	99081402000

Errors are expressed in percentage of Full Scale

Test Procedure
FieldCheck

Zero Test	Amplifier	Current Output	Sensor Test
Current out = +0.001 mA	MP1 = -0.45 %	MP1 = +0.002 mA	Coil Current Rise = 6.40
	MP2 = -0.48 %	MP2 = -0.009 mA	Rated for 5.00
	MP3 = +0.03 %	MP3 = +0.003 mA	Potential Difference = 0.00
	MP4 = +0.07 %	MP4 = +0.002 mA	

Comments

The instrument under test has passed the annual calibration.

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4.2 FIT 402 Final Effluent Flow

Flow Transmitter
As Found Results

Instrument Calibration/Verification Report

Date: May 19 , 2021

Client Details

Customer	O.C.W.A. Merrickville
Contact	Jeff Morrison
	613-257-9223
Calibrations by:	Tim Stewart
	Capital Controls
	613-248-1999

Instrument Details

Manufacturer	Eand H
Model	Promag 53W DN 250
Serial Number	DB09BC16000
Location	W.W.T.P.
Process	Final Effluent
Tag ID	FIT-402
Output	4-20 mA

Calibration Equipment

Make	Fluke Meter	FieldCheck
Model	725	50098801
Serial #	8759025	990B1402000

Errors are expressed in percentage of Full Scale

Test Procedure
FieldCheck

Zero Test	Amplifier	Current Output	Sensor Test
Current out = +0.001 mA	MP1 = -0.53 %	MP1 = +0.002 mA	Coil Current Rise = 20.25
	MP2 = -0.48 %	MP2 = -0.011 mA	Rated for 14.60
	MP3 = -0.01 %	MP3 = +0.003 mA	Potential Difference = 0.00
	MP4 = +0.03 %	MP4 = +0.002 mA	

Comments

The instrument under test has passed the annual calibration.

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4.3 FIT 501 Septage/Supernatant Flow

Flow Transmitter
As Found Results

Instrument Calibration/Verification Report

Date: May 19 , 2021

Client Details

Customer	O.C.W.A. Merrickville
Contact	Jeff Morrison
	613-257-9223
Calibrations by:	Tim Stewart
	Capital Controls
	613-248-1999

Instrument Details

Manufacturer	Eand H
Model	Promag 53W DN 150
Serial Number	DB09BA16000
Location	W.W.T.P.
Process	Septage/Supernatant
Tag ID	FIT-501
Output	4-20 mA

Calibration Equipment

Make	Fluke Meter	FieldCheck
Model	725	50098801
Serial #	8759025	99081402000

Errors are expressed in percentage of Full Scale

Test Procedure
FieldCheck

Zero Test	Amplifier	Current Output	Sensor Test
Current out = +0.001 mA	MP1 = -0.57 %	MP1 = +0.002 mA	Coil Current Rise = 17.19
	MP2 = -0.02 %	MP2 = -0.015 mA	Rated for 9.60
	MP3 = -0.02 %	MP3 = +0.003 mA	Potential Difference = 3.26
	MP4 = +0.01 %	MP4 = +0.000 mA	

Comments

The instrument under test has passed the annual calibration.

CapitalControls
Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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4.4 FIT 305 Raw Sewage Flow

Flow Transmitter
As Found Results

Instrument Calibration/Verification Report

Date: May 19 , 2021

Client Details

Customer	O.C.W.A. Merrickville
Contact	Jeff Morrison
	613-257-9223
Calibrations by:	Tim Stewart
	Capital Controls
	613-248-1999

Instrument Details

Manufacturer	Eand H
Model	Promag 53W DN 150
Serial Number	DB09BB16000
Location	W.W.T.P.
Process	Raw Sewage
Tag ID	FIT-305
Output	4-20 mA

Calibration Equipment

Make	Fluke Meter	FieldCheck
Model	725	50098801
Serial #	8759025	99081402000

Errors are expressed in percentage of Full Scale

Test Procedure
FieldCheck

Zero Test	Amplifier	Current Output	Sensor Test
Current out = +0.002 mA	MP1 = -0.51 %	MP1 = +0.001 mA	Coil Current Rise = 13.35
	MP2 = -0.02 %	MP2 = -0.011 mA	Rated for 9.60
	MP3 = -0.03 %	MP3 = -0.002 mA	Potential Difference = 3.29
	MP4 = +0.02 %	MP4 = -0.010 mA	

Comments

The instrument under test has passed the annual calibration.

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5.1 Calibration Certificates

Calibration Certificate
Kalibrations-Zertifikat

FieldCheck

Page 1 of 2
Seite 1 of 2

Production Number Fabrikationsnummer	240223
Serial Number Seriennummer	99081402000
Manufacturer Hersteller	Endress+Hauser Flowtec AG CH-4153 Reinach

Date Of Calibration Kalibrierdatum	03/03/2021
Location Ort	DG-Greenwood
Testing Instruction Prüfanweisung	CalCenter_2
Test Program Prüfprogramm	V1.01.10
Test Engineer Prüfer	Jamie

Used Test-/Calibration Interface Verwendete Prüf-/Kalibrierschnittstelle	--
Used Test-/Calibration Tools Verwendete Prüf-/Kalibriermittel	Keithley DMM2700 due 07/2021 Yokogawa CAL100 due 07/2021
Max. Deviation (Specification) Max. Abweichung (Spezifikation)	
Current Source Stromquelle	0,01% of end value / des Endwertes (20mA) + 0,02% of signal / des Signals
Frequency Source Frequenzgeber	0,01% of signal / des Signals

Notes Bemerkungen	The above mentioned calibration tools are traceable to national standards / NIST Die oben genannten Kalibriermittel sind rückführbar auf nationale Normale

Date, Signature: 03/03/2021,

10-830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

Calibration Certificate
Kalibrations-Zertifikat

FieldCheck

Production Number / Fabrikationsnummer: 240220
Serial Number / Seriennummer: 99051402000

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Seite 2 of 2

Measuring Data On Incoming Inspection / Messdaten bei der Eingangsprüfung		Rated Value / Vorgabewert	Meas. Value / Messwert	Limit Value +/- / Grenzwert +/-	Pass / Fail / Gut/Fehlerhaft
Current Input / Strom-Eingang	mA	0.000	**0.000**	0.005	Pass/Gut
	mA	20.000	**20.003**	0.010	Pass/Gut
Frequency Input / Frequenz-Eingang	Hz	0.0	**0.0**	0.0	Pass/Gut
	Hz	8000.0	**7998.9**	4.0	Pass/Gut

Measuring Data After Calibration / Messdaten nach Kalibrierung		Rated Value / Vorgabewert	Meas. Value / Messwert	Limit Value +/- / Grenzwert +/-
Current Input / Strom-Eingang	mA	0.000	**0.002**	0.002
	mA	10.000	**10.003**	0.004
	mA	20.000	**20.001**	0.005
Frequency Input / Frequenz-Eingang	Hz	0.0	**0.0**	0.0
	Hz	1000.0	**1000.0**	1.0
	Hz	8000.0	**8000.0**	2.0

Functional Safety Check
Funktionaler Sicherheitscheck

This unit has passed the complete Functional Safety Check.
All voltages and currents produced by this unit are within tolerances.

Dieses Gerät hat den vollständigen funktionalen Sicherheitscheck bestanden
Alle von diesem Gerät produzierten Spannungen und Ströme sind innerhalb der Toleranz

Date, Signature: 03/03/2021,

10-830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

Calibration Certificate
Kalibrations-Zertifikat

Simubox MID

Page 1 of 2
Seite 1 of 2

Production Number Fabrikationsnummer	8784351
Serial Number Seriennummer	JA0FE402000
Manufacturer Hersteller	Endress+Hauser Flowtec AG CH-4153 Reinach

Date Of Calibration Kalibrierdatum	03/03/2021
Location Ort	DG-Greenwood
Testing Instruction Prüfanweisung	CalCenter_2
Test Program Prüfprogramm	V1.01.10
Test Engineer Prüfer	Jamie

Used Test-/Calibration Interface Verwendete Prüf-/Kalibrierschnittstelle	–
Used Test-/Calibration Tools Verwendete Prüf-/Kalibriermittel	Keithley DMM2700 due 07/2021 Yokogawa CAL100 due 07/2021
Max. Deviation (Specification) Max. Abweichung (Spezifikation)	
Current Source Stromquelle	0,01% of end value / des Endwertes (20mA) + 0,02% of signal / des Signals
Frequency Source Frequenzgeber	0,01% of signal / des Signals

Notes Bemerkungen	The above mentioned calibration tools are traceable to national standards / NIST Die oben genannten Kalibriermittel sind rückführbar auf nationale Normale

Date, Signature: 03/03/2021,

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Calibration Certificate
Kalibrations-Zertifikat

SimuBox MID

Production Number / Fabrikationsnummer: 8784051
Serial Number / Seriennummer: [illegible]

Measuring Data On Incoming Inspection Messdaten bei der Eingangsprüfung (Calculated Mean Values / Berechnete Mittelwerte)	Rated Value Vorgabewert [µV]	Meas. Value Messwert [µV]	Limit Value +/- Grenzwert +/- [µV]	Pass / Fail Gut/Fehlerhaft
Meas. Range 1	57.0	57.0	1.0	Pass/Gut
Meas. Range 2	331.0	332.7	3.0	Pass/Gut
Meas. Range 3	2064.0	2061.7	10.0	Pass/Gut
Meas. Range 4	11826.0	11821.2	20.0	Pass/Gut

Measuring Data After Calibration Messdaten nach Kalibrierung (Calculated Mean Values / Berechnete Mittelwerte)	Rated Value Vorgabewert [µV]	Meas. Value Messwert [µV]	Limit Value +/- Grenzwert +/- [µV]
Meas. Range 1	50.0	49.8	0.5
Meas. Range 2	300.0	300.0	1.0
Meas. Range 3	2000.0	2000.0	3.0
Meas. Range 4	10000.0	9999.6	5.0

Date, Signature: 03/09/2021,