



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Ontario Clean Water Agency
5 Industrial Dr.
Chesterville ON
K0C 1H0
Phone: 613-448-3098
Fax: 613-448-1616

March 27, 2017

Ministry of the Environment & Climate Change
Kingston Office
1259 Gardiners Rd.
Kingston, Ontario
K7M 8S5

Attention: Lyn Garrah, Water Supervisor

Dear Ms. Garrah,

SUBJECT: Iroquois Wastewater Treatment Plant - 2016 Annual Report

Please find enclosed the 2016 Annual Performance Report for the Iroquois Wastewater Treatment Plant. This report was completed in accordance with Section 10(6) of Amended Certificate of Approval No. 9689-8MQHNK. This report was prepared by the Ontario Clean Water Agency on behalf of the Municipality of South Dundas, based on the information provided. The report covers the period from January 1, 2016 to December 31, 2016.

Should you require any further information, please do not hesitate to contact our office.

Yours truly,

Dawn Crump
Process and Compliance Technician
Ontario Clean Water Agency
Seaway Valley Hub

c.c. Shannon Geraghty, C.A.O./Treasurer, Municipality of South Dundas
Chris Bazinet, Director of Public Works, Municipality of South Dundas
Denis Villeneuve, Chief Operator/ORO, Municipality of South Dundas

Iroquois Wastewater Treatment Plant **2016 Annual Performance Report**

The Iroquois WWTP is a Class II wastewater treatment facility owned and operated by the Municipality of South Dundas. Raw sewage is conveyed from the collection system to the plant pumping station which is equipped with three submersible pumps. From the pumping station, wastewater passes through the inlet works, including mechanically cleaned fine screens and a grit removal and disposal system. Aluminum Sulphate is added to assist in phosphorous removal. The wastewater then moves through either of two parallel Sequential Batch Reactors (SBR) equipped with individual aeration systems, mixers, decanters and sludge removal pumps. Effluent decanted from the SBRs is treated by UV disinfection and subsequently passes through an outfall pipe to the St. Lawrence River.

Sludge removed from the SBRs is transferred to a waste activated sludge tank. From the tank, the sludge enters a rotary drum thickener. Polymer is added to assist with the thickening process. Thickened sludge is pumped to an Autothermal Thermophilic Aerobic Digestion (ATAD) system for stabilization. The ATAD system is equipped with an off-gas scrubber and biofilter to provide odour control. The digested sludge is then pumped to one of three biosolids storage tanks. From the storage tanks, biosolids are hauled off site to be utilized as soil conditioner.

The following report addresses the requirements outlined in Condition 10 (6) of Amended Certificate of Approval #9689-8MQHNK issued on October 25, 2011.

10(6) The Owner shall prepare and submit to the District Manager, a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works;

The total volume of effluent discharged in 2016 was approximately 685,510 m³. The average rate of effluent discharge was approximately 1,877 m³/day. The calculated percent removal of CBOD₅, TP, SS and NH₃ in the final effluent described in the following paragraphs was determined using data from weekly effluent samples and monthly raw sewage composite sample results for the reporting period.

The allowable monthly average concentration for CBOD₅ in the effluent as stated in Condition 7 is 25 mg/L. The corresponding loading limit is 82.5 kg/day. Average concentrations and loadings were well below the limits specified in the ECA. For 2016, the average CBOD₅ in the effluent was < 3.04 mg/L which equates to > 89 % removal of CBOD₅ from the raw sewage. The average loading rate for 2016 was < 5.92 kg/day which is < 7.2% of the allowable limit of 82.5 kg/day.

The allowable monthly average concentration for Suspended Solids (SS) as stated in Condition 7 is 25mg/L. The corresponding loading limit is 82.5 kg/day. Average concentrations and loadings were well below the limits specified in the ECA. In 2016, the average concentration of SS in the effluent was approximately 4.1 mg/L which equates to 84% removal of SS from the raw influent. The average loading rate of SS for 2016 was 8 kg/day which is 9.7% of the allowable 82.5 kg/day limit.

The monthly average concentration limit of Total Phosphorus (TP) as stated in Condition 7 is 1.0 mg/L. The corresponding loading limit is 3.3 kg/day. Average concentrations and loadings were well below the limits specified in the ECA. The average monthly concentration for TP during this reporting period was 0.21 mg/L. This represents a 78% removal of TP from the raw influent. The average monthly loading rate of TP for 2016 was 0.42 kg/day which is 12.7% of the allowable 3.3 kg/day limit as outlined in Condition 7.

The monthly average concentration limit for ammonia as stated in Condition 7 is 10 mg/L from June through September and 15 mg/L from October through May. The monthly average loading limit is 33.0 kg/day and 49.5, respectively. The average monthly concentration for ammonia during the June - September reporting period was 0.03 mg/L. The average monthly loading rate of ammonia during that time was 0.027 kg/day which is 0.09% of the allowable 33.0 kg/day limit. The average monthly concentration for ammonia during the October - May reporting period was 0.05 mg/L. The average monthly loading rate of ammonia during that time was 0.113 kg/day which is 0.23% of the allowable 49.5 kg/day limit, as outlined in Condition 7.

Condition 7 stipulates that the *E. coli* monthly geometric mean density must not exceed 200 organisms/100 mL of effluent. During 2016, the average monthly geometric mean was < 3.64 CFU/ 100 mL which did not exceed the monthly limit.

Condition 7 also requires the effluent too be non-acutely lethal to Rainbow Trout and *Daphnia Magna*, with grab samples being collected on a quarterly basis. None of the samples collected in 2016 were found to be acutely lethal.

The pH of the effluent remained within the range of 6.0 – 9.5 specified in Table 2.

A summary of laboratory results can be found in the 2016 PARs, attached in Appendix A.

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

- Screen compacter system motor overloaded due to build up of debris. Removed debris and returned to normal operation.
- High flows caused inlet channel to back up. Manually switched plant operation to ‘storm’ mode. Plant is now programmed to automatically switch to ‘storm’ mode upon detection of high inflow.

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

Please see the External Maintenance Summary in Appendix B.

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

Effluent samples are collected on a weekly basis. All samples are analyzed by a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA). 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 test methods.

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

The reports verifying required annual calibrations and verifications can be found attached in Appendix C.

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6;

Condition 6.1 - During the reporting period all monthly average concentrations of CBOD₅, TSS, TP and TAN were below the effluent objectives. The *E. coli* monthly geometric means were also below the stated objective.

Condition 6.2 (a) - Effluent pH remained within the 6.5- 9.5 range specified in the ECA.

Condition 6.2 (b) - The monthly average day flows remained below the 3,300 m³/day design capacity. In addition, the daily maximum rated capacity of 16,800 m³/day was not exceeded in 2016.

Condition 6.2 (c) - Effluent was essentially free of floating or settleable solids and did not contain substances that would cause a film, sheen, foam or discoloration to the receiving stream.

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

In 2016, a total of 434 m³ of liquid biosolids was utilized as soil conditioner. The sludge was land applied in September (NASM Plan #22432). It is anticipated that approximately the same volume of sludge will be generated in 2017.

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

There were no reported complaints received in relation to the Iroquois WWTP and its operation during the reporting period.

(i) a summary of all By-pass, spill or abnormal discharge events;

None to report.

(j) any other information the District Manager requires from time to time.

No requests for additional information have been made.

APPENDIX A:
OPERATIONAL DATA

ONTARIO CLEAN WATER AGENCY

IROQUOIS WASTEWATER TREATMENT PLANT PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: SOUTH DUNDAS
 PROJECT: IROQUOIS WWTP

WORKS NUM.: 120000159

DESCRIPTION: TWO SEQUENTIAL BATCH REACTORS AND AEROBIC SLUDGE DIGESTION

YEAR: 2016
 WATER COURSE: ST. LAWRENCE
 DESIGN CAPACITY: 3,300 m³/d

MONTH	RAW			TREATED			RAW				SLUDGE
	Total Flow m ³	Avg Day Flow m ³	Max Day Flow m ³ /d	Total Flow m ³	Avg Day Flow m ³	Max Day Flow m ³ /d	Raw BOD (mg/L)	Raw SS (mg/L)	Raw PHOS. (mg/L)	Raw TKN (mg/L)	Liquid Sludge Hauled m ³
JAN	69,866	2,254	4,424	68,106	2,197	4,550	47	64	1.64	16.6	0
FEB	96,768	3,337	9,421	94,971	3,275	9,749	77	48	1.13	8.6	0
MAR	138,620	4,332	10,172	134,778	4,348	10,582	10	20	0.42	3.1	0
APR	90,686	3,023	6,080	90,433	3,014	6,091	26	30	1.24	12.1	0
MAY	50,629	1,633	7,574	43,529	1,404	1,696	5	5	0.28	2.5	0
JUN	39,200	1,307	2,498	37,961	1,265	2,470	14	9	0.63	6.0	0
JUL	31,395	1,013	1,336	29,729	959	1,380	26	28	1.03	8.0	0
AUG	25,795	832	1,133	24,095	777	1,194	13	24	0.73	5.8	0
SEPT	18,910	630	720	17,231	574	660	51	16	1.05	8.4	434
OCT	35,253	1,137	4,147	32,758	1,057	4,311	25	32	2.08	18.2	0
NOV	37,589	1,253	1,855	35,541	1,185	1,718	<3	6	0.41	3.7	0
DEC	78,551	2,534	6,054	76,379	2,464	5,722	16	32	0.62	5.1	0
TOTAL	713,262			685,510							434
AVG		1,940			1,877		28	26	0.94	8.2	
MAX			10,172			10,582					
CRITERIA			16,800		3,300						

COMPLIANCE			YES		YES						
------------	--	--	-----	--	-----	--	--	--	--	--	--

2016 - IROQUOIS WWTP EFFLUENT SAMPLING MONTHLY AVERAGES

MONTH	DATE	CBOD (mg/L)	SS (mg/L)	TP (mg/L)	NH ₃ (mg/L)	E. Coli (CFU/100ml)
January	7-Jan-16	< 3	3	0.17	< 0.01	2
	14-Jan-16	< 3	6	0.23	< 0.01	2
	21-Jan-16	< 3	5	0.19	< 0.01	2
	28-Jan-16	< 3	4	0.23	< 0.01	2
	Monthly Average	3	4.5	0.205	0.01	2
	Compliant?	YES	YES	YES	YES	YES
February	04-Feb-16	< 3	7	0.25	< 0.01	2
	11-Feb-16	< 3	5	0.21	< 0.01	2
	18-Feb-16	< 3	3	0.1	< 0.01	2
	25-Feb-16	< 3	3	0.12	0.18	10
	Monthly Average	3.0	4.5	0.17	0.05	3
	Compliant?	YES	YES	YES	YES	YES
March	03-Mar-16	< 3	7	0.14	< 0.01	2
	10-Mar-16	< 4	12	0.24	0.35	2
	17-Mar-16	< 3	12	0.32	0.03	2
	22-Mar-16	< 3	9	0.26	0.05	2
	31-Mar-16	< 3	9	0.26	0.07	2
	Monthly Average	3.2	9.8	0.24	0.10	2
April	07-Apr-16	< 3	3	0.12	0.06	2
	14-Apr-16	< 3	6	0.26	< 0.01	2
	20-Apr-16	< 3	6	0.25	0.06	8
	28-Apr-16	< 3	3	0.15	0.07	4
	Monthly Average	3	4.5	0.195	0.05	3
	Compliant?	YES	YES	YES	YES	YES
May	05-May-16	< 4	3	0.12	0.02	4
	12-May-16	< 3	3	0.08	0.04	8
	19-May-16	< 3	3	0.09	0.03	4
	26-May-16	< 3	3	0.08	0.02	16
	Monthly Average	3.25	3	0.09	0.03	7
	Compliant?	YES	YES	YES	YES	YES
June	02-Jun-16	< 3	3	0.12	0.04	6
	09-Jun-16	< 3	3	0.11	< 0.01	2
	16-Jun-16	< 3	3	0.15	0.02	6
	23-Jun-16	< 3	3	0.15	0.03	4
	30-Jun-16	< 3	3	0.13	< 0.01	6
	Monthly Average	3.00	3.00	0.13	0.02	4
July	07-Jul-16	< 3	3	0.14	< 0.01	2
	14-Jul-16	< 3	3	0.15	< 0.01	8
	21-Jul-16	< 3	3	0.17	0.03	14
	28-Jul-16	< 3	5	0.32	< 0.01	10
	Monthly Average	3	3.5	0.20	0.02	7
	Compliant?	YES	YES	YES	YES	YES
August	04-Aug-16	< 3	3	0.25	0.01	2
	11-Aug-16	< 3	3	0.29	0.02	2
	18-Aug-16	< 3	5	0.34	0.02	10
	25-Aug-16	< 3	3	0.24	0.01	4
	Monthly Average	3	3.5	0.28	0.02	4
	Compliant?	YES	YES	YES	YES	YES
September	01-Sep-16	< 3	3	0.35	< 0.01	10
	08-Sep-16	< 3	3	0.41	< 0.01	2
	15-Sep-16	< 3	3	0.49	0.04	12
	22-Sep-16	< 3	3	0.56	0.06	14
	29-Sep-16	< 3	3	0.78	0.04	2
	Monthly Average	3	3	0.52	0.03	6
October	06-Oct-16	< 3	3	0.9	0.09	4
	13-Oct-16	< 3	3	0.16	0.03	2
	20-Oct-16	< 3	3	0.12	0.07	2
	27-Oct-16	< 3	3	0.21	0.02	2
	Monthly Average	3	3.0	0.35	0.05	2
	Compliant?	YES	YES	YES	YES	YES
November	03-Nov-16	< 3	3	0.21	< 0.01	4
	10-Nov-16	< 3	3	0.23	0.05	2
	17-Nov-16	< 3	3	0.17	0.04	6
	24-Nov-16	< 3	3	0.17	< 0.01	6
	Monthly Average	3	3	0.20	0.03	4
	Compliant?	YES	YES	YES	YES	YES
December	01-Dec-16	< 3	7	0.27	< 0.01	12
	08-Dec-16	< 3	3	0.19	< 0.01	2
	15-Dec-16	< 3	3	0.13	0.01	2
	22-Dec-16	< 3	3	0.17	< 0.01	-
	28-Dec-16	< 3	3	0.1	0.06	2
	Monthly Average	3.0	3.8	0.17	0.02	3
December	Compliant?	YES	YES	YES	YES	YES

2016 - IROQUOIS WWTP LOADING CALCULATIONS

MONTH	Total Effluent Flow (m ³)		BOD	SS	TP	NH ₃
January	69,866	Monthly Average (mg/L)	3.0	4.5	0.205	0.01
		Loading (kg/d)	6.76	10.14	0.46	0.02
		Compliant?	YES	YES	YES	YES
February	96,768	Monthly Average (mg/L)	3	4.5	0.17	0.0525
		Loading (kg/d)	9.36	14.05	0.53	0.16
		Compliant?	YES	YES	YES	YES
March	138,620	Monthly Average (mg/L)	3.2	9.8	0.24	0.10
		Loading (kg/d)	14.31	43.82	1.09	0.46
		Compliant?	YES	YES	YES	YES
April	90,686	Monthly Average (mg/L)	3.0	4.5	0.20	0.05
		Loading (kg/d)	8.78	13.16	0.57	0.15
		Compliant?	YES	YES	YES	YES
May	50,629	Monthly Average (mg/L)	3.3	3	0.09	0.0275
		Loading (kg/d)	5.31	4.90	0.15	0.04
		Compliant?	YES	YES	YES	YES
June	39,200	Monthly Average (mg/L)	3.0	3	0.13	0.02
		Loading (kg/d)	3.79	3.79	0.17	0.03
		Compliant?	YES	YES	YES	YES
July	31,395	Monthly Average (mg/L)	3.0	3.5	0.20	0.02
		Loading (kg/d)	3.04	3.54	0.20	0.02
		Compliant?	YES	YES	YES	YES
August	25,795	Monthly Average (mg/L)	3.0	3.5	0.28	0.02
		Loading (kg/d)	2.50	2.91	0.23	0.01
		Compliant?	YES	YES	YES	YES
September	18,910	Monthly Average (mg/L)	3.0	3	0.52	0.03
		Loading (kg/d)	1.83	1.83	0.32	0.02
		Compliant?	YES	YES	YES	YES
October	35,253	Monthly Average (mg/L)	3	3.0	0.17	0.04
		Loading (kg/d)	3.41	3.41	0.19	0.05
		Compliant?	YES	YES	YES	YES
November	37,589	Monthly Average (mg/L)	3	3.0	0.20	0.03
		Loading (kg/d)	3.64	3.64	0.24	0.03
		Compliant?	YES	YES	YES	YES
December	78,551	Monthly Average (mg/L)	3.0	3.8	0.17	0.02
		Loading (kg/d)	7.60	9.63	0.44	0.05
		Compliant?	YES	YES	YES	YES

2016 - IROQUOIS WWTP EFFLUENT UN-IONIZED AMMONIA

Sample Date	Sample Temperature ° C	Sample Temp. Kelvin	Dissociation Constant pK_a	Effluent Sample pH on-site	Fraction of Un-ionized Ammonia	Total Ammonia (mg/L) (NH ₃ + NH ₄ as N)	Un-ionized Ammonia (mg/L)
7-Jan-16	10.1	283.25	9.73	8.00	0.0184	< 0.01	0.0002
14-Jan-16	9.5	282.65	9.75	8.00	0.0175	< 0.01	0.0002
21-Jan-16	7.9	281.05	9.80	8.60	0.0589	< 0.01	0.0006
28-Jan-16	9.6	282.75	9.75	8.60	0.0668	< 0.01	0.0007
04-Feb-16	7.2	280.35	9.83	8.20	0.0230	< 0.01	0.0002
11-Feb-16	8.5	281.65	9.78	8.10	0.0203	< 0.01	0.0002
18-Feb-16	8.1	281.25	9.80	8.20	0.0247	< 0.01	0.0002
25-Feb-16	7.9	281.05	9.80	8.30	0.0304	0.18	0.0055
03-Mar-16	7.1	280.25	9.83	8.00	0.0145	< 0.01	0.0001
10-Mar-16	5.7	278.85	9.88	8.20	0.0205	0.35	0.0072
17-Mar-16	7.4	280.55	9.82	8.40	0.0366	0.03	0.0011
22-Mar-16	7.0	280.15	9.83	8.50	0.0442	0.05	0.0022
31-Mar-16	7.1	280.25	9.83	7.50	0.0046	0.07	0.0003
07-Apr-16	7.1	280.25	9.83	8.00	0.0145	0.06	0.0009
14-Apr-16	7.2	280.35	9.83	8.10	0.0184	< 0.01	0.0002
21-Apr-16	7.7	280.85	9.81	8.10	0.0191	0.06	0.0011
28-Apr-16	8.0	281.15	9.80	8.50	0.0477	0.07	0.0033
05-May-16	10.4	283.55	9.72	8.40	0.0459	0.02	0.0009
12-May-16	9.9	283.05	9.73	8.40	0.0442	0.04	0.0018
19-May-16	10.2	283.35	9.72	7.80	0.0118	0.03	0.0004
26-May-16	11.8	284.95	9.67	8.20	0.0327	0.02	0.0007
02-Jun-16	13.3	286.45	9.62	7.80	0.0149	0.04	0.0006
09-Jun-16	12.9	286.05	9.63	8.00	0.0227	< 0.01	0.0002
16-Jun-16	14.2	287.35	9.59	7.50	0.0081	0.02	0.0002
23-Jun-16	14.2	287.35	9.59	7.80	0.0159	0.03	0.0005
30-Jun-16	14.8	287.95	9.57	7.50	0.0084	< 0.01	0.0001
07-Jul-16	15.2	288.35	9.56	7.80	0.0172	< 0.01	0.0002
14-Jul-16	15.8	288.95	9.54	7.70	0.0143	< 0.01	0.0001
21-Jul-16	17.1	290.25	9.50	7.80	0.0198	0.03	0.0006
28-Jul-16	16.5	289.65	9.52	7.50	0.0096	< 0.01	0.0001
04-Aug-16	17.6	290.75	9.48	7.90	0.0257	0.01	0.0003
11-Aug-16	17.5	290.65	9.48	7.30	0.0065	0.02	0.0001
18-Aug-16	17.5	290.65	9.48	7.50	0.0103	0.02	0.0002
25-Aug-16	17.6	290.75	9.48	7.50	0.0104	0.01	0.0001
01-Sep-16	18.1	291.25	9.46	7.30	0.0068	< 0.01	0.0001
08-Sep-16	18.1	291.25	9.46	7.70	0.0170	< 0.01	0.0002
15-Sep-16	17.3	290.45	9.49	7.80	0.0200	0.04	0.0008
22-Sep-16	19.2	292.35	9.43	7.60	0.0146	0.06	0.0009
29-Sep-16	17.7	290.85	9.48	7.50	0.0105	0.04	0.0004
06-Oct-16	17.5	290.65	9.48	7.50	0.0103	0.09	0.0009
13-Oct-16	17.1	290.25	9.50	7.60	0.0126	0.03	0.0004
20-Oct-16	17.8	290.95	9.47	7.70	0.0166	0.07	0.0012
27-Oct-16	15.1	288.25	9.56	8.00	0.0268	0.02	0.0005
04-Nov-16	15.5	288.65	9.55	7.90	0.0220	< 0.01	0.0002
10-Nov-16	15.8	288.95	9.54	8.10	0.0352	0.05	0.0018
17-Nov-16	15.0	288.15	9.56	8.50	0.0794	0.04	0.0032
24-Nov-16	13.8	286.95	9.60	8.00	0.0243	< 0.01	0.0002
01-Dec-16	13.7	286.85	9.61	8.20	0.0377	< 0.01	0.0004
08-Dec-16	13.0	286.15	9.63	8.10	0.0286	< 0.01	0.0003
15-Dec-16	12.4	285.55	9.65	8.40	0.0532	0.01	0.0005
22-Dec-16	12.0	285.15	9.66	8.00	0.0212	< 0.01	0.0002
28-Dec-16	10.4	283.55	9.72	8.40	0.0459	0.06	0.0028

$f = 1/(10^{(pK_a - pH)} + 1)$, where f is the decimal fraction of un-ionized ammonia (NH₃).

$pK_a = 0.09018 + 2729.92/T$, where pK_a is the dissociation constant of ammonia at a given temperature.

$T = (K = \text{degrees C} + 273.16)$, where T is the ambient water temperature in Kelvin.

2016 - IROQUOIS WWTP AEROBIC BIOSOLIDS RESULTS

SLUDGE RESULTS		07-Jan-16	04-Feb-16	03-Mar-16	07-Apr-16	05-May-16	02-Jun-16	07-Jul-16	04-Aug-16	01-Sep-16	06-Oct-16	03-Nov-16	01-Dec-16
Ammonia	mg/L	1040	909	858	879	755	646	907	1460	931	849	861	828
Nitrate	mg/L	4	0.6	0.6	2.1	1.2	2.8	1.9	2.8	3.3	3	4.3	1.2
Ammonia + Nitrate	mg/L	1044	910	859	881	756	649	909	1463	934	852	865	829
Total Phosphorus	mg/L	1230	908	990	610	912	677	1650	1070	1900	984	887	942
Total Solids	mg/L	33300	27900	36900	20900	23500	22900	24200	18200	30800	37600	23400	29800
Aluminum	mg/L	2770	1710	1510	1450	1200	1200	1400	1090	1500	1480	1320	1120
Arsenic	mg/L	0.40	0.20	0.20	< 0.10	0.10	< 0.10	0.1	< 0.1	0.2	0.1	0.20	< 0.10
Cadmium	mg/L	0.030	< 0.030	0.030	< 0.030	< 0.030	< 0.030	< 0.03	< 0.03	0.030	< 0.03	0.030	< 0.030
Chromium	mg/L	1.44	0.76	1.09	0.63	0.73	0.95	0.67	0.65	0.67	1.32	0.69	0.85
Cobalt	mg/L	0.29	0.13	0.200	0.14	0.10	0.12	0.1	0.05	0.06	0.07	0.06	0.04
Copper	mg/L	67.00	34.50	35.60	26.00	24.50	24.70	25.7	25.9	38.3	48.5	38.10	38.90
Lead	mg/L	2.20	1.10	1.30	0.90	1.10	1.10	0.8	0.7	0.9	1.1	0.90	1.00
Mercury	mg/L	0.02	0.01	0.07	0.01	0.01	0.10	0.01	0.012	0.012	0.043	0.02	0.08
Molybdenum	mg/L	0.52	0.28	0.32	0.22	0.21	0.22	0.26	0.25	0.25	0.39	0.26	0.30
Nickel	mg/L	1.54	0.87	1.07	0.82	0.91	0.88	0.78	0.7	0.8	0.96	0.69	0.68
Selenium	mg/L	0.30	0.10	0.20	< 0.10	0.10	0.10	0.2	0.1	0.2	0.2	0.20	0.10
Zinc	mg/L	30.8	17.30	16.80	15.10	14.40	13.90	15.3	14.7	20.9	19.4	20.0	16.90

2016 - IROQUOIS WWTP MONTHLY AEROBIC BIOSOLIDS CONCENTRATION RATIO

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Ammonia	1040	909	858.00	879	755.0	646.0	907	1460	931	849	861	828
Nitrate	4	0.6	0.60	2.1	1.2	2.8	1.9	2.8	3.3	3	4	1
Ammonia + Nitrate	1044	909.6	858.60	881.1	756.2	648.8	908.9	1462.8	934.3	852	865	829
Total Phosphorus	1230	908	990.00	610	912.0	677.0	1650	1070	1900	984	887	942
Total Solids	33300	27900	36900.00	20900	23500.0	22900.0	24200	18200	30800	37600	23400	29800
Aluminum	2770	1710	1510.00	1450	1200.0	1200.0	1400	1090	1500	1480	1320	1120
Arsenic	0.4	0.2	0.20	0.1	0.1	0.1	0.1	0.1	0.2	0	0	0
Cadmium	0.0	0.03	0.03	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chromium	1.4	0.76	1.09	0.63	0.7	1.0	0.7	0.7	0.7	1.3	0.7	0.9
Cobalt	0.29	0.13	0.20	0.14	0.10	0.12	0.10	0.05	0.06	0.07	0.06	0.04
Copper	67.0	34.5	35.60	26	24.5	24.7	25.7	25.9	38.3	48.5	38.1	38.9
Lead	2.2	1.1	1.30	0.9	1.1	1.1	0.8	0.7	0.9	1.1	0.9	1.0
Mercury	0.023	0.010	0.07	0.008	0.010	0.101	0.010	0.012	0.012	0.043	0.015	0.075
Molybdenum	0.5	0.28	0.32	0.22	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3
Nickel	1.5	0.87	1.07	0.82	0.9	0.9	0.8	0.7	0.8	1.0	0.7	0.7
Selenium	0.3	0.1	0.20	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1
Zinc	30.8	17.3	16.80	15.1	14.4	13.9	15.3	14.7	20.9	19.4	20.0	16.9

2016 - IROQUOIS WWTP MONTHLY AEROBIC BIOSOLIDS CONCENTRATION RATIO

Metals ratio = mg metals/kg solids

	Metal/Solids Ratio (Sludge)												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Limit
Arsenic	12.01	7.17	5.42	4.78	4.26	4.37	4.13	5.49	6.49	2.66	8.55	3.36	170
Cadmium	0.90	1.08	0.81	1.44	1.28	1.31	1.24	1.65	0.97	0.80	1.28	1.01	34
Chromium	43.24	27.24	29.54	30.14	31.06	41.48	27.69	35.71	21.75	35.11	29.49	28.52	2800
Cobalt	8.71	4.66	5.42	6.70	4.26	5.24	4.13	2.75	1.95	1.86	2.56	1.34	340
Copper	2012.01	1236.56	964.77	1244.02	1042.55	1078.60	1061.98	1423.08	1243.51	1289.89	1628.21	1305.37	1700
Lead	66.07	39.43	35.23	43.06	46.81	48.03	33.06	38.46	29.22	29.26	38.46	33.56	1100
Mercury	0.69	0.36	2.01	0.38	0.43	4.41	0.41	0.66	0.39	1.14	0.64	2.52	11
Molybdenum	15.62	10.04	8.67	10.53	8.94	9.61	10.74	13.74	8.12	10.37	11.11	10.07	94
Nickel	46.25	31.18	29.00	39.23	38.72	38.43	32.23	38.46	25.97	25.53	29.49	22.82	420
Selenium	9.01	3.58	5.42	4.78	4.26	4.37	8.26	5.49	6.49	5.32	8.55	3.36	34
Zinc	924.92	620.07	455.28	722.49	612.77	606.99	632.23	807.69	678.57	515.96	854.70	567.11	4200

Sludge is Acceptable	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
----------------------	-------	------	------	------	------	------	------	------	------	------	------	------	------

SOME ANALYSIS RESULTS EXPRESSED AS "<" (LESS THAN);HOWEVER, IN ORDER TO COMPLETE THE CALCULATION, ONLY THE NUMERIC VALUE WAS USED; THEREFORE THE AVG. CONC. IS GREATER THAN ACTUAL.

APPENDIX B:

EXTERNAL MAINTENANCE SUMMARY

Iroquois Wastewater
External Maintenance Summary - 2016

Jan 5: Atel Air on site to fix furnace

Jan 19: Atel Air on site to fix fire damper

Jan 27: TPS on site to adjust programming for foam LIT

Feb 4-5: Hewitt's replacing bearings in scrubber fan

Feb 29: Premier Tech changed wasting removal to a fixed number and not based off of nominal flow

April 4: Premier Tech changed timing of SBR sequences

April 12-13: Gen Rep & All-Teck Electrical set up temporary generator

April 15: Arthor Thom Electric looking at Screen 2 motor

April 20: Hewitt's on site to fix screen motor

April 22: Gen Rep and All-Teck Electrical onsite to install new controller in generator

May 30: Hewitt removed scrubber fan

June 3: Hewitt's re-installed scrubber fan

June 24: Hewitt's on site to work on de-grit shoot

July 27-29: Capital Controls on site to calibrate flow meters

Aug 22: ISI on site to do ATAD programming

Sept 19: Bell replacing modem

Nov. 29: Edge Tech verifying gas detectors

Oct. 24: Gen Rep on site to conduct generator maintenance

APPENDIX C:

INSTRUMENT CALIBRATIONS & VERIFICATIONS

CapitalControls

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

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

5 Iroquois WPCP.

Site Reports July, 2016

CapitalControls

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

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

5.1 FIT-401 Waste Sludge Basin 1:

DTM Version: 3.13.00

Page 1/3

Flowmeter Verification Certificate Transmitter

Customer	Plant
Order code	Taq Name
PROMAG 10 W DN80	1.0381 - 1.0381
Device type	K-Factor
H107C816000	0
Serial number	Zero point
V1.03.00	
Software Version Transmitter	Software Version I/O-Module
28.07.2016	09:19
Verification date	Verification time

Verification result Transmitter: Passed

Test item	Result	Applied Limits
Amplifier	Passed	Basis: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Passed	1 P
Test Sensor	Passed	

FieldCheck Details	Simubox Details
103801	8723898
Production number	Production number
1.07.07	1.00.01
Software Version	Software Version
04/2016	04/2016
Last Calibration Date	Last Calibration Date

Date Operator's Sign Inspector's Sign

Overall results:

The achieved test results show that the instrument is completely functional, and the measuring results lie within +/- 1% of the original calibration. ¹⁾

The calibration of the Fieldcheck test system is fully traceable to national standards.

1) Prerequisite is an additional proof of electrode integrity with high voltage test.

Endress+Hauser

Prozess für Industrie- und Umwelttechnik

CapitalControls

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

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

Page 2/3

FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Tag Name	
Device type	PROMAG 10 W DN80	K-Factor	1.0381 - 1.0381
Serial number	H107C816000	Zero point	0
Software Version Transmitter	V1.03.00	Software Version I/O-Module	
Verification date	28.07.2016	Verification time	09:19

Verification Flow end value (100 %): 20.106 l/s
Flow speed 4.00 m/s

Passed / Failed	Test item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.005 l/s (5%)	1.60 %	0.31 %
✓		2.011 l/s (10.0%)	1.10 %	0.29 %
✓		12.054 l/s (60.0%)	0.68 %	-0.00 %
✓		20.106 l/s (100%)	0.65 %	0.02 %
✓	Current Output 1	4.000 mA (0%)	0.05 mA	0.000 mA
✓		4.800 mA (5%)	0.05 mA	0.000 mA
✓		5.600 mA (10.0%)	0.05 mA	0.001 mA
✓		13.600 mA (60.0%)	0.05 mA	-0.000 mA
✓		20.000 mA (100%)	0.05 mA	0.006 mA
✓	Pulse Output 1	19 P	1 P	1 P
		Start value	Limit range	Measured value
	Test Sensor			
✓	Coil Curr. Rise	50.000 ms	13.340..50.000 ms	43.261 ms
✓	Coil Curr. Stability		—	—

Legend of symbols

✓	✗	—	?	!
Passed	Failed	not tested	not testable	Attention

CapitalControls

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

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

Page 3/3

FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Tag Name	
Device type	PROMAG 10 W DMS0	K-Factor	1.0381 - 1.0381
Serial number	H187C816000	Zero point	0
Software Version Transmitter	V1.03.00	Software Version I/O-Module	
Verification date	28.07.2016	Verification time	09:19

Current Output	Assign	Current Range	Value 0 4mA	Value 20 mA		
Terminal 26/27	VOLUME FLOW	4-20 mA activ	0.0 l/s	50.00 l/s		
Pulse Output	Assign	Pulse Value	Output signal	Pulse width		
Terminal 24/25	VOLUME FLOW	0.008 m3/P	Passive/Positive	100.01 ms		

Actual System Ident.

125.0

CapitalControls

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

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

5.2 FIT-402 Waste Sludge Basin 2:

DTM Version: 3.13.00

Page 1/3

Flowmeter Verification Certificate Transmitter

Customer	Plant
Order code	Taq Name
PROMAG 10 W DN80	0.9737 - 0.9737
Device type	K-Factor
JAD91316000	0
Serial number	Zero point
V1.04.00	
Software Version Transmitter	Software Version I/O-Module
28.07.2016	10:04
Verification date	Verification time

Verification result Transmitter: Passed

Test item	Result	Applied Limits
Amplifier	Passed	Basis: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Passed	1 P
Test Sensor	Passed	

FieldCheck Details	Simubox Details
103601	8723898
Production number	Production number
1.07.07	1.00.01
Software Version	Software Version
04/2016	04/2016
Last Calibration Date	Last Calibration Date


Date _____ Operator's Sign _____ Inspector's Sign _____

Overall results:

The achieved test results show that the instrument is completely functional, and the measuring results lie within +/- 1% of the original calibration. ¹⁾

The calibration of the Fieldcheck test system is fully traceable to national standards.

¹⁾ Prerequisite is an additional proof of electrode integrity with high voltage test.

Endress+Hauser 
People for process automation

CapitalControls

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

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

Page 2/3

FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Tag Name	
Device type	PROMAG 10 W DN00	K-Factor	0.5737 - 0.5737
Serial number	JAD91516000	Zero point	0
Software Version Transmitter	V1.04.00	Software Version I/O-Module	
Verification date	28.07.2016	Verification time	10:04

Verification Flow end value (100 %): 20.106 l/s
Flow speed 4.00 m/s

Passed / Failed	Test item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.005 l/s (5%)	1.60 %	-0.03 %
✓		2.011 l/s (10.0%)	1.10 %	-0.02 %
✓		12.064 l/s (60.0%)	0.66 %	0.04 %
✓		20.106 l/s (100%)	0.65 %	-0.02 %
✓	Current Output 1	4.000 mA (0%)	0.05 mA	-0.006 mA
✓		4.800 mA (5%)	0.05 mA	-0.007 mA
✓		5.600 mA (10.0%)	0.05 mA	-0.008 mA
✓		13.600 mA (60.0%)	0.05 mA	-0.022 mA
✓		20.000 mA (100%)	0.05 mA	-0.026 mA
✓	Pulse Output 1	74 P	1 P	0 P
		start value	limits range	measured value
	Test Sensor			
✓	Coil Curr. Rise	50.000 ms	13.340..50.000 ms	42.891 ms
✓	Coil Curr. Stability		—	—

Legend of symbols

✓	✗	—	?	!
Passed	Failed	not tested	not testable	Attention

CapitalControls

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

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

Page 3/3

FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Tag Name	
Device type	PROMAG 10 W DNE0	K-Factor	0.9737 - 0.9737
Serial number	JA081316000	Zero point	0
Software Version Transmitter	V1.04.00	Software Version I/O-Module	
Verification date	28.07.2016	Verification time	10:04

Current Output	Assign	Current Range	Value 0_4mA	Value 20 mA		
Terminal 26/27	VOLUME FLOW	4-20 mA activ	0.0 l/s	50.00 l/s		
Pulse Output	Assign	Pulse Value	Output signal	Pulse width		
Terminal 24/25	VOLUME FLOW	0.008 m3/P	Passive/Positive	100.01 ms		

Actual System Ident.

129.0

CapitalControls

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

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

5.3 FIT-305 Raw Sewage Influent Channel 1:

FIELD EQUIPMENT VERIFICATION & CALIBRATION REPORT

DATE: July 26 / 2016

DESCRIPTION: Iroquois WPCP Raw Sewage Influent Ch#1. MODEL: OCM III Model: 7ML 1002-0AA05 TAG: FIT-305
MANUFACTURER: Siemens Serial # S/N. PDB/C0010053

Client Name: Township of South Dundas. Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						Calibration by means of Simulating Channel Level
1	TAGGING			X		Milltronics OCM-III Configuration
2						Flume Type = Parshall Size = 12"
MECHANICAL						P47- Blanking Distance = 61.01694 cm
3	MOUNTING: check for proper fastening, etc.	X				P46 - Zero Head = 173.3498 cm
4	ORIENTATION: check for proper angle, etc.)	X				P7 - Max. Head = 44.28499 cm
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	X				P1 Linear Units = cm Flow Units = l/s
6						Type = Flow Parshall Damping = 20%
ELECTRICAL						Relay 1 = Off Relay 2 = Off Relay 2 = Off
7		X				Trending Configuration Sample at 60 min. Intervals
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				

SET-UP/CALIBRATION

DIGITAL		ADJUSTMENT USING		VERIFIED USING	SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE		Level Target	0 – 199.5 l/sec
		ELECTRONIC TYPE		Fluke 702 calibrator S/N 6160219 Cal. Report# June 28, 2016	

Configuration Parameters:		Calibration Data Test Tolerance: 15.00%				Notes
		Input Variable	Transmitter Var.	Cal. Value	% Error	
		31.9 cm	119.8 l/s	120.03 l/s	-.02%	
		40.37 cm	173.8 l/s	174.70 l/s	-.02%	@ 17.89 mA

NOTES : ***Current calculated based on Display Variable 4.68 mA = ((174.7/199.5)*16) +4

Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100
= ((17.89 mA - 18.01 mA) / 16 mA) * 100
= -0.75 % of full scale

Checked By: Tim Stewart

Cell: 613 325 9213
Email: tim.stewart@capitalcontrols.ca

CapitalControls

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

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

5.4 FIT-306 Raw Sewage Influent Channel 2:

FIELD EQUIPMENT VERIFICATION & CALIBRATION REPORT

DATE: July 26 / 2016

DESCRIPTION: Iroquois WPCP Raw Sewage Influent Ch#2.

MODEL: OCM III Model: 7ML 1002-0AA05

TAG: FIT-306

MANUFACTURER : Siemens

Serial # S/N. PDB/C0010053

Client Name: Township of South Dundas.

Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						Calibration by means of Simulating Channel Level
1	TAGGING			X		Milltronics OCM-III Configuration
2						Flume Type = Parshall Size = 12"
MECHANICAL						P47- Blanking Distance = 61.01694 cm
3	MOUNTING: check for proper fastening, etc.	X				P46 - Zero Head = 173.4538 cm
4	ORIENTATION: check for proper angle, etc.)	X				P7 - Max. Head = 44.1699 cm
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	X				P1 Linear Units = cm Flow Units = l/s
6						Type = Flow Parshall Damping = 20%
ELECTRICAL						Relay 1 = Off Relay 2 = Off Relay 2 = Off
7		X				Trending Configuration Sample at 60 min. Intervals
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				

SET-UP/CALIBRATION

DIGITAL			ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE	
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE			Level Target			
		ELECTRONIC TYPE			Fluke 702 calibrator S/N 6160219 Cal. Report# June 28, 2016		0 – 198.7 l/sec	
Configuration Parameters:			Calibration Data Test Tolerance: 15.00%					
			Input Variable	Transmitter Var.	Cal. Value	% Error	Notes	
			8 cm	13.9 l/sec	13.2 l/s			
			32 cm	124.8 l/sec	120.6 l/s			
			32 cm	124.8 l/sec	13.99 mA	-35%		

NOTES:***Current calculated based on Display Variable 4.68 mA = ((124.8/198.7)*16) +4

Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100
= ((13.99 mA - 14.04 mA) / 16 mA) * 100
= -0.35 % of full scale

Checked By: Tim Stewart

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

CapitalControls

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

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

5.5 FIT-901 Effluent Pump Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						
DESCRIPTION: Iroquois WPCP Effluent Pump Flow				MODEL: 7ME69201AA101AA0		DATE: July 29 / 2016
MANUFACTURER : Siemens				Serial N1D6053478		TAG: FIT-901
Client Name: Township of South Stormont .				Device Output Signal : 4.00 - 20.0 mA		
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		- Flow Verification by means of Coil Verification and output measurement
2						
MECHANICAL						
	MOUNTING: Check for proper fastening, etc.	X				Coil resistance : 112 Ohms = passed
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				
		ELECTRONIC TYPE	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016		0.0 – 75.0 l/Sec = 4.00 to 20.0 mA
Configuration Parameters:			Calibration Data Test Tolerance: 0.50%			
		Input Variable	Output Variable	% Error	Status	Notes
	FIT-901	5.8 l/Sec	5.231 mA	-0.0375%	Passed	
NOTES:***Current calculated based on Display Variable 5.237 mA = ((5.8/75.0)*16) +4 Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100 = ((5.231 mA - 5.237 mA) / 16 mA) * 100 = -0.0375 % of full scale					Checked By: <i>Tim Stewart</i> Cell: 613 25 9213 Email: tim.stewart@capitalcontrols.ca	

Capital Controls

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

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

5.6 FIT-304 Raw Waste Water Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: July 29 2016

DESCRIPTION: Iroquois WPCP Raw Water Flow

MODEL: 7ME65204PJ132AA2

TAG: FIT-304

MANUFACTURER : Siemens FM MAG 5100W

Serial: 192102H243

Client Name: Township of South Stormont .

Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Flow verification by coil verification and output measurement
2						
MECHANICAL						Coil Resistance = 110.7 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				

SET-UP/CALIBRATION

DIGITAL		ADJUSTMENT USING		VERIFIED USING	SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE			
		ELECTRONIC TYPE	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	0.0 – 300.0 l/Sec = 4.00 to 20.0 mA
Configuration Parameters:		Calibration Data Test Tolerance: 0.50%			
		Input Variable	Output Variable	% Error	Status Notes
					n/a Accuracy of 2% of Full Scale & Linearity 5%
	FIT- 304	55 l/Sec	6.89 mA	-0.25%	Passed

NOTES:***Current calculated based on Display Variable 6.93 mA = ((55/300.0)*16) +4

Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100
 = ((6.89mA - 6.93 mA) / 16 mA) * 100
 = -0.25 % of full scale

Checked By: *Tim Stewart*

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

Capital Controls

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

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

5.7 FIT-302 P.S Inlet Sewage Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: July 29 / 2016

DESCRIPTION: Iroquois WPCP Inlet Sewage Flow Elizabeth St. Pump Station

MODEL: 7ME65204PJ132AA2

TAG: FIT-302

MANUFACTURER : Siemens FM MAG 6000W

Serial: N1D2087032

Client Name: Township of South Stormont .

Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Flow verification by coil verification and output measurement
2						
MECHANICAL						Coil Resistance = 98.7 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
13						

SET-UP/CALIBRATION

DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				
		ELECTRONIC TYPE	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016		0.0 – 400.0 l/Sec = 4.00 to 20.0 mA
Configuration Parameters:			Calibration Data Test Tolerance: 0.50%			
			Input Variable	Output Variable	% Error	Status Notes
	FIT-302		86 l/Sec	7.53 mA	0.563%	Passed Accuracy of 2% of Full Scale & Linearity 5%

NOTES:***Current calculated based on Display Variable 7.44 mA = ((86/400)*16) +4

Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100
= ((7.53mA - 7.44 mA) / 16 mA) * 100
= 0.563 % of full scale

Checked By: Tim Stewart

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

CapitalControls

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

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

5.8 FIT-301 Inlet Sewage Plant Pump Station Flow

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: July 29 / 2016

DESCRIPTION: Iroquois Inlet Sewage Plant P.S Flow Sewage Flow

MODEL: 7ME69201AA101AA0

TAG: FIT-301

MANUFACTURER : Siemens FM MAG 6000

Serial: N1D2087032

Client Name: Township of South Stormont .

Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		- Flow Verification by means of coil verification and output measurement
2						
MECHANICAL						Coil Resistance = 99.1 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				

SET-UP/CALIBRATION

DIGITAL		ADJUSTMENT USING		VERIFIED USING	SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE			
		ELECTRONIC TYPE	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016	0.0 – 400.0 l/Sec = 4.00 to 20.0 mA

Configuration Parameters:

Calibration Data Test		Tolerance: 0.50%			
Input Variable	Output Variable	% Error	Status	Notes	
FIT- ST.A	58 l/Sec	6.33 mA	0.0625%	Passed	Accuracy of 2% of Full Scale & Linearity 5%

NOTES:***Current calculated based on Display Variable $6.32 \text{ mA} = ((58/400)*16) + 4$

Error (% Full Scale) = $((\text{Measured Output} - \text{Calculated Variable}) / \text{Full Scale}) * 100$
 $= ((6.33 \text{ mA} - 6.32 \text{ mA}) / 16 \text{ mA}) * 100$
 $= 0.0625 \% \text{ of full scale}$

Checked By: *Tim Stewart*

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

CapitalControls

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

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

5.9 FIT-501 U.V Inlet Channel Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: July 26 / 2016

DESCRIPTION: Iroquois U.V Inlet Channel Flow

MODEL: 7ME65201AA101AA0

TAG: FIT-501

MANUFACTURER : Siemens FM MAG 6000

Serial: N1D2087032

Client Name: Township of South Stormont .

Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Channel Configuration:
2						
MECHANICAL						H = 0.868m
						B = 0.900m
	MOUNTING: Check for proper fastening, etc.	X				Sensor Configuration:
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				h _{Sensor} = 0.000 m (at bottom) h _{max} = 0.868 (max level)
6	Cleaning: Check for Staining or Deposits, etc.)					Velocity = Sensor#1 Mounting = 0.000m Wedge Pos. Average = X1
ELECTRICAL						Analog Configuration:
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				Channel 1 = 0/4 mA to 20 mA
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				Communications:
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				Mask I/P = 255.255.255.0
						Remote I/P = 192.168.000.010
						Gateway = 192.168.000.001
						Calculated I/Sec. = (0.868x0.900x(0.848/0.289))1000

SET-UP/CALIBRATION

DIGITAL			ADJUSTMENT USING	VERIFIED USING	SETPOINT / RANGE			
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE			0.0 – 400.0 I/Sec = 4.00 to 20.0 mA			
		ELECTRONIC TYPE	Fluke 725 calibrator S/N 8759025 Cal. Report# June 28, 2016					
Configuration Parameters:			Calibration Data Test Tolerance: 2%					
			Input Variable	Output Variable	% Error	Status	Notes	
	FIT- 501	Velocity 0.352 m/Sec	Area = .861 x .900 =.7749m2	274.3 I/Sec	14.8 mA	-.625%	passed	Accuracy of 2% of Full Scale & Linearity 5%

NOTES:***Current calculated based on Display Variable 14.90 mA = ((274.3/400)*16) +4

Error (% Full Scale) = ((Measured Output - Calculated Variable) / Full Scale) * 100
= ((14.8mA - 14.9 mA) / 16 mA) * 100
= -0.625 % of full scale

Checked By: Tim Stewart

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

CapitalControls

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

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

6 Reference Certificates

6.1 Endress FieldCheck Certificate

FieldCheck Details
103601
Production number
1.07.07
Software Version
04/2016
Last Calibration Date

Simubox Details
8723698
Production number
1.00.01
Software Version
04/2016
Last Calibration Date

.....
Date Operator's Sign Inspector's Sign

Overall results:

The achieved test results show that the instrument is completely functional, and the measuring results lie within +/- 1% of the original calibration. ¹⁾

The calibration of the Fieldcheck test system is fully traceable to national standards.

1) Prequalita is an additional proof of electrode integrity with high voltage test.

Endress+Hauser 
People for Process Automation

CapitalControls

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

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

6.2 Fluke Calibration Certificate



www.pyronelectronics.com

Pylon Electronics Inc.
147 Colonnade Road,
Ottawa, ON K2E

Page 1 of 1

CERTIFICATE OF CALIBRATION

Description	MULTI FUNCTION PROCESS	Work Order	H35658
Model Number	725	Serial Number	8759025
Instrument Id	N/A	Cal Procedure	SEE TEST DATA SHEET
Manufacturer	FLUKE	Cal Date	28 Jun 2016
Customer Name	CAPITAL CONTROLS	Recall Cycle	52 Weeks
Purchase Order	Credit Card	Next Cal Date	28 Jun 2017

Calibration Environment: Temperature 22.8 °C Relative Humidity 34.0 %RH

Received Condition: Not Within Tolerance

Completed Condition: Within Tolerance

Remarks: 24mA output and measurement out of tolerance. Performed full alignment.

Standards Used to Establish Traceability

Instrument Type	Model	Asset #
CALIBRATOR	5520A-SC1100	13113
REFERENCE MULTIMETER	8506A	12927

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined on the Test Data Sheet (TDS), unless otherwise indicated. The Certificate received and completed conditions and the TDS specifications are based on the procedure(s) and/or specification(s) as listed on the TDS unless otherwise indicated. Any statement of compliance is made without taking measurement uncertainty into account and is based on the instrument's performance against the test limits documented on the test data sheet.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2005. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

This report consists of two parts with separate page numbering schemes; the Certificate of Calibration and the Test Data Sheet (TDS). Copyright of this report is owned by the issuing laboratory and may not be reproduced, other than in full, except with the prior written permission of the issuing laboratory.

Test data As Found and Final (or k:G) results are the same unless reported otherwise. Certificate remarks identify if adjustments were performed.

Metrologist: 606

Quality Assurance: 288

Date of Issue: 28 Jun 2016

FORM Rev 1.5

HALIFAX

MONTREAL

OTTAWA

TORONTO

pylon

CapitalControls

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

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



Calibration Test Data

Description: Multifunction Process Calibrator
Model: 725
Customer ID: 8759025
Manufacturer: Fluke
Customer: CAPITAL CONTROLS

Work order: H35658
Serial: 8759025
Procedure: Fluke 725: (1 year) CAL VER RS-232
/S520/8508
Proc. Rev.: \$Revision: 1.7 \$
Cal Date: 28 June 2016

Test Results

AS-LEFT

Test Description	Adjustment	Units	Test Result	Lower Limit	Upper Limit	Pass/Fail	%Tol
VOLT PERMANENT DIVISION: 2.2							
VOLTS MEASUREMENT: Upper Display							
0.000 V		V	0.000	-0.002	0.002	Pass	0 %
15.000 V		V	15.000	14.995	15.005	Pass	0 %
30.000 V		V	30.000	29.992	30.008	Pass	0 %
MILLIVOLTS MEASUREMENT: Lower Display							
0.00 mV		mV	0.00	-0.02	0.02	Pass	0 %
45.00 mV		mV	44.99	44.97	45.03	Pass	34.5 %
90.00 mV		mV	90.00	89.96	90.04	Pass	0 %
VOLTS MEASUREMENT: Lower Display							
0.000 V		V	0.000	-0.002	0.002	Pass	0 %
10.000 V		V	10.000	9.996	10.004	Pass	0 %
20.000 V		V	19.999	19.984	20.006	Pass	16.7 %
MILLIAMPS MEASUREMENT: Upper Display							
4.000 mA		mA	3.999	3.997	4.003	Pass	35.7 %
12.000 mA	12.0000	mA	11.999	11.996	12.004	Pass	23.7 %
24.000 mA	23.9998	mA	24.000	23.993	24.007	Pass	3.24 %
MILLIAMPS MEASUREMENT: Lower Display							
4.000 mA		mA	4.000	3.997	4.003	Pass	0 %
12.000 mA	12.0000	mA	12.000	11.996	12.004	Pass	1.02 %
24.000 mA	23.9998	mA	24.000	23.993	24.007	Pass	3.24 %
FREQUENCY MEASUREMENT: Lower Display							
10.00 kHz @ 1 Vpp		kHz	10.00	9.98	10.02	Pass	0 %
FREQUENCY SOURCE: Lower Display							
10.00 kHz @ 5 V		kHz	10.000	9.975	10.025	Pass	0 %
FOUR-WIRE RESISTANCE MEASUREMENT: Lower Display							

Work order: H35658

Customer ID: 8759025

Page 1 of 3

Capital Controls

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

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

Test Results

AS-LEFT

Test Description	Actual/Applied	Units	Test Result	Lower Limit	Upper Limit	Pass/Fail	% Tol
400 Ohm Range							
15.00 Ohm		Ω	15.01	14.90	15.10	Pass	10 %
350.00 Ohm		Ω	350.00	349.90	350.10	Pass	0 %
1500 Ohm Range							
500.0 Ohm		Ω	500.0	499.5	500.5	Pass	0 %
1500.0 Ohm		Ω	1500.0	1499.5	1500.5	Pass	0 %
3200 Ohm Range							
3200.0 Ohm		Ω	3200.0	3199.0	3201.0	Pass	0 %
THREE-WIRE SPD MEASUREMENT: Lower Display							
350.00 Ohm		Ω	349.99	349.85	350.15	Pass	6.67 %
TEMPERATURE MEASUREMENT: Lower Display (J Type)							
0.00 °C		°C	0.00	-0.70	0.70	Pass	0 %
TEMPERATURE SOURCE: Lower Display (J Type)							
0.00 °C		°C	-0.130	-0.700	0.700	Pass	10.6 %
MILLIAMPS SOURCE: Lower Display							
6.000 mA		mA	3.9996	3.9972	6.0028	Pass	16.3 %
12.000 mA		mA	11.9997	11.9956	12.0044	Pass	6.82 %
24.000 mA		mA	23.9991	23.9932	24.0068	Pass	13.2 %
MILLIVOLTS SOURCE: Lower Display							
0.00 mV		mV	-0.001	-0.020	0.020	Pass	5 %
45.00 mV		mV	44.999	44.971	45.029	Pass	2.76 %
100.00 mV		mV	100.001	99.960	100.040	Pass	2 %
VOLTS SOURCE: Lower Display							
0.000 V		V	0.0000	-0.0020	0.0020	Pass	0.785 %
5.000 V		V	5.0000	4.9970	5.0030	Pass	0.667 %
10.000 V		V	10.0000	9.9960	10.0040	Pass	1 %
RESISTANCE SOURCE: Lower Display							
400 Ohm Range							
15.0 Ohm		Ω	15.00	14.90	15.10	Pass	0 %
360.0 Ohm		Ω	360.00	359.90	360.10	Pass	10 %
1500 Ohm Range							
500.0 Ohm		Ω	499.96	499.50	500.50	Pass	4 %
1500.0 Ohm		Ω	1500.01	1499.50	1500.50	Pass	2 %
3200 Ohm Range							

Work order: H35658

Customer ID: 8759025

Page 2 of 3

CapitalControls

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

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

Test Results		AS-LEFT					
<u>Test Description</u>	<u>Actual Applied</u>	<u>Units</u>	<u>Test Result</u>	<u>Lower Limit</u>	<u>Upper Limit</u>		<u>%Tol</u>
3200 Ohm		Ω	3200.0	3199.0	3201.0	Pass	0 %
Resistor Module Input							
Resistor Module Input						N/A	
VERIFICATION COMPLETE							
***** End of Report *****				Date Printed: June 28, 2016			

Capital Controls

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

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

6.3 pH Buffer Standard Certificates



4301 boul. des Chénies, Proulx
Montreal, Québec, H1R 1A5
Tél. (514) 353-9851
F. (514) 353-9301
www.acpchemicals.com

Date : 02/02/2016

CERTIFICATE OF ANALYSIS/CERTIFICAT D'ANALYSE

PRODUCT/PRODUIT: B5*40
Buffer Standard
Tampon de Référence
Red oil 4.00 Rouge

LOT: K2515

TEST	SPECIFICATIONS	RESULTS/RESULTATS
Potassium Biphthalate Buffer Traceable to N.I.S.T. pH @ 25°C Tampon de Biphthalate de Potassium Conforme aux normes de N.I.S.T.	4.00 ± 0.01	4.01

A handwritten signature in black ink, appearing to read 'Rouge', is written over a horizontal line.

Quality Control Department
Dépt. Contrôle de la Qualité

Capital Controls

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

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



4601, 5001, 5002 Grandpa P. Rd.
Montreal, Quebec H1H 1A6
T (514) 634-0381
F (514) 634-0381
www.acpchem.com

Date: 05/04/2018

CERTIFICATE OF ANALYSIS/CERTIFICAT D'ANALYSE

PRODUCT/PRODUIT: B5200
Buffer Standard
Tampon de Référence
Green pH 7.00 Vert

LOT: C0816

FW/PM:

TEST
pH @ 25°C

SPECIFICATIONS
7.00 ± 0.01

RESULTS/RESULTATS
8.99

Traceable to N.I.S.T. / Traçable à N.I.S.T.

A handwritten signature in black ink, appearing to read 'John P. Smith', is written over a horizontal line.

Quality Control Department
Dépt. Contrôle de la Qualité

CapitalControls

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

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

HACH COMPANY



An ISO 9001 Certified Company

P.O. Box 380
Loveland, CO 80539
(970) 669-3550

Certificate of Analysis

Page 1

COMMODITY: StabCal® Standard, 20 NTU

COMMODITY NUMBER: 26601-49

MANUFACTURE DATE:

DATE OF ANALYSIS:

LOT NUMBER: A6179

7/1/2016

7/5/2016

TEST	SPECIFICATIONS	RESULTS
Turbidity	19 to 21 NTU	20.0 NTU

The expiration date is Jan 2018

Formazin and StabCal® solutions provided by Hach are not NIST traceable because the NIST does not carry turbidity standards. However, the use of Formazin and StabCal® as used in Hach method 8190 are accepted by the EPA as a primary standard to be used in the calibration of all turbidity instruments.

Certified by

A handwritten signature in cursive script, appearing to read "Scott Als".

Scott Als
Analytical Services Chemist