

**PUBLIC UTILITIES COMMISSION
FOR THE MUNICIPALITY OF CHATHAM-KENT
TILBURY WATER POLLUTION CONTROL PLANT**

2018 PERFORMANCE REPORT

January 1 to December 31, 2018

Certificate of Approval # 6980-6BLJ9R

Plant Description

The Tilbury Wastewater Treatment Plant is located north of Highway 401 in the Town of Lakeshore and treats domestic and industrial wastewater generated by the Town of Tilbury. Wastewater is collected by 8 sanitary pump stations with the Lyon Street Pump Station supplying the facility. This mechanical treatment plant replaced the existing lagoon system. The final effluent is discharged into Tremblay Creek.

The Tilbury Wastewater Treatment Plant upgrade was completed in late December of 2004. The design capacity of the plant is 5,434m³/day with a Peak Flow Rate of 13,700m³/day.

A portion of the lagoon system was turned into a wildlife wetland.

The treatment system includes the following processes:

- Headworks building
- Orbal oxidation ditch
- Two secondary clarifiers
- Tertiary Treatment building
- Ultra Violet Light disinfection

REPORTING REQUIREMENTS UNDER CERTIFICATE OF APPROVAL #6980-6BLJ9R

Summary and Interpretation of Monitoring and Comparison to the Effluent Limits: Condition 10 (6) (a)

Tables 1 & 2 outline the monthly average results for parameters tested compared to the limits outlined in the Certificate of Approval Table 2 Effluent Limits.

An exceedance of the average monthly concentration effluent limit for Total Phosphorus occurred in the months of September, October, November and December.

The PUC has determined that the root cause is intermittent discharges of non-reactive phosphorus from a local industry and is working closely with the industry to address the issue.

Success and Adequacy of the Works

During the reporting period, the annual average daily flow was 1,872 m³/day, which represents approximately 34% of the rated capacity of 5,434m³/day. The maximum daily flow was 8,465 m³/day, which is 62% of the Peak Flow Rate of 13,700 m³/day

Table 1: Summary of Monitoring Data and Comparison to Effluent Limits & Objectives – Concentrations
as well as rated capacity to the sewage works

Plant rated capacity of 5,434m³/day

Total sewage flow to the works during a calendar year divided by the number of days during which sewage was flowing to the works that year

Month	Total Monthly Flow m ³	Avg Daily Flow /Month m ³ /day	Avg Daily Flow/ Year m ³ /day	% of Plant Capacity	CBOD ₅ mg/L	Total S.S. mg/L	Total Ammonia mg/L	Total P mg/L	pH Min	pH Max	E.Coli/100 mL CFU GeoMean
Limits: May 1 – Oct 31	None	None	5,434	100	10	10	2.0	0.50	6.0 – 9.5		150
Limits: Nov 1 – Apr 31	None	None	5,434	100	10	10	4.0	0.50	6.0 – 9.5		150
Objectives: May 1 – Oct 31	None	None	5,434	100	5	5	1.0	0.30	6.0 – 9.5		100
Objectives: Nov 1 – Apr 31	None	None	5,434	100	5	5	2.0	0.30	6.0 – 9.5		100
Jan	76,457	2,466			2.0	3.0	0.20	0.31	7.4	8.1	10
Feb	75,317	2,690			2.0	5.0	1.22	0.42	7.6	8.3	10
Mar	58,165	1,876			2.0	5.0	0.90	0.40	7.7	8.3	10
Apr	58,518	1,951			2.0	6.0	1.60	0.28	7.3	8.0	10
May	60,161	1,941			2.0	4.0	0.18	0.30	7.0	8.3	15
Jun	46,208	1,540			2.0	3.0	0.08	0.38	6.8	7.5	13
Jul	44,324	1,430			8.0	2.0	0.13	0.38	6.7	7.8	10
Aug	58,675	1,893			2.0	3.0	0.11	0.33	6.9	7.7	10
Sept	54,907	1,830			3.0	4.0	0.29	0.60	6.9	7.4	10
Oct	51,802	1,671			2.0	4.0	0.98	0.71	7.0	7.8	13
Nov	55,022	1,834			2.0	4.0	1.38	0.69	7.2	7.9	10
Dec	43,750	1,411			2.5	8.0	3.58	0.95	7.1	8.1	44
YEAR			1,872	34%							
	Yearly Total Flow m³	Yearly Maximums									
	683,305	2,690			8.0	8.0	3.58	0.95	7.7	8.3	44

Table 2: Summary of Monitoring Data and Comparison to Influent Limits - Loadings

Month	Avg Daily Influent Flow /Month m ³ /day	CBOD ₅ kg/day	Total S.S. kg/day	Total P kg/day	Total Ammonia kg/day
Limits: May 1 – Oct 31	None	54.0	54.0	2.7	10.8
Limits: Nov 1 – Apr 31	None	54.0	54.0	2.7	21.6
Jan	2,466	4.9	7.4	0.8	0.5
Feb	2,690	5.4	13.5	1.1	3.3
Mar	1,876	3.8	9.4	0.8	1.7
Apr	1,951	3.9	11.7	0.5	3.1
May	1,941	3.9	7.8	0.6	0.3
Jun	1,540	3.1	4.6	0.6	0.1
Jul	1,430	11.4	2.9	0.5	0.2
Aug	1,893	3.8	5.7	0.6	0.2
Sept	1,830	5.4	7.3	1.1	0.5
Oct	1,671	4.7	5.4	2.4	0.86
Nov	1,834	5.6	8.5	2.4	2.6
Dec	1,411	4.7	11.4	1.7	5.5
		Yearly Maximums			
		11.4	13.5	2.4	5.5

**Operating Problems and Corrective Action:
Condition 10 (6) (b) continued**

Exceedances of the average monthly concentration effluent limit for Total Phosphorus occurred in the months of September, October, November and December.

The PUC has determined that the root cause is intermittent discharges of non-reactive phosphorus from a local industry and is working closely with the industry to address the issue.

**Summary of Maintenance Activities:
Condition 10 (6) (c)**

Routine maintenance was performed throughout the reporting period. Chatham-Kent PUC utilises the electronic preventative maintenance program to track preventative maintenance. In addition to the routine maintenance, the following additional maintenance activities were completed for the reporting period:

• New bearings Orbal Drive	\$ 3,782
• Rebuild Flygt pump Lyon Ave Pump Station	7,106
• New Effluent Waterline	7,954
• New Effluent Tertiary Pump	16,000
• Process Air Blower	30,000

**Quality Assurance and Control Measures:
Condition 10 (6) (d)**

The Chatham-Kent Public Utilities Commission followed a sampling schedule developed in accordance with the Certificate of Approval and applicable regulations for this reporting period.

Composite chemistry samples of the raw flow were collected using an auto sampler. Chemistry samples were submitted weekly to an accredited laboratory for analysis of CBOD₅, Total Suspended Solids, Total Kjeldhal Nitrogen, Nitrite and Nitrate, Total Phosphorus, Total Ammonia Nitrogen, Alkalinity and pH.

Composite chemistry samples of the effluent were collected using an auto sampler. Chemistry samples were submitted weekly to an accredited laboratory for analysis of CBOD₅, Total Suspended Solids, Total Kjeldhal Nitrogen, Total Phosphorus and Total Ammonia Nitrogen, Alkalinity, pH, Nitrite and Nitrate and Unionized Ammonia.

Bacteriological samples of the effluent were collected weekly according to the Sampling Program. Bacteriological samples were submitted weekly to an accredited laboratory for analysis.

In house samples were analysed by a licensed operator for pH and temperature.

Calibration and Maintenance on Effluent Monitoring Equipment Condition 10 (6) (e)

All required probes and sensors are cleaned, maintained and/or calibrated on a monthly basis or as required by manufacturers' specifications.

Monitoring equipment calibration/verification report(s) included for the following:

- Influent flow meter
- Effluent flow meter
- Spectrophotometer
- DO meter
- pH meter

Effluent Objectives Condition 10 (6) (f)

Table 1 outlines monthly average results of parameters tested compared to the objectives outlined in the Certificate of Approval Table 1 Effluent Objectives.

The following criteria was exceeded during this reporting period for the effluent objectives outlined in Condition 6 Effluent Objectives of the Certificate of Approval:

Total Phosphorous in the following months:

January, February, March, June, July, August, September, October, November and December

Total Suspended Solids in the months of April and December

CBOD₅ in the month of July.

The PUC has determined that the root cause of the majority of the issues is intermittent discharges of non-reactive phosphorus from a local industry and is working closely with the industry to address.

Sludge Management Condition 10 (6) (g)

During the reporting period waste activated sludge totalling 23,718 m³ was transferred to Lagoons 1 & 2 for sludge stabilization and storage.

Outline of Anticipated Volumes in Next Reporting Period

The sludge production and sludge handling method for the coming reporting period is anticipated to be the similar to that of this reporting period.

**Community Complaints:
Condition 10 (6) (h)**

There were no Customer Complaints received during the reporting period.

**By-pass, Spill, or Abnormal Discharge Events:
Condition 10 (6) (i)**

There were no by-pass, spill, or abnormal discharge events for the reporting period beyond those already discussed.

**Other Information the District Manager Requires:
Condition 10 (6) (j)**

No other information was required from the District Manager during this reporting period.

APPENDIX A

Yearly Operational Data Summary for the Reporting Period

	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	TOTAL	MAX	MIN	AVG
Raw Sewage Flow																
Total Flow 1000m ³	76.457	75.317	58.165	58.518	60.161	46.208	44.324	58.675	54.907	51.802	55.022	43.750	683.305	76.46	43.75	56.94
Raw Peak Flow L/Sec	226.0	230.0	134.0	201.0	150.0	165.0	159.0	219.0	228.0	175.0	156.0	57.0		230.0	57.0	175.0
WAS Flow 1000m ³	9.11	9.51	9.83	10.83	8.35	8.99	7.51	11.11	11.22	9.45	9.31	9.01	114.24	11.22	7.51	9.52
RAS Flow 1000m ³	197.80	174.50	188.22	176.86	191.03	179.64	187.39	182.45	179.03	186.16	177.17	180.22	2200.47	197.80	174.50	183.37
Cell 1 & 2 to Plant 1000m ³	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland to Plant 1000m ³	1.97	1.35	3.67	6.23	15.10	15.23	16.25	15.70	15.14	13.68	14.21	10.10	128.64	16.25	1.35	10.72
Overflow to Lagoons 1000m ³	0.18	2.13	0.93	2.55	2.48	0.15	0.13	3.41	7.39	2.71	1.63	0.01	23.72	7.39	0.01	1.98
Raw Pump Hours	487.1	521.4	511.7	573.7	583.0	439.0	404.4	513.4	438.5	455.3	488.2	385.5	5801.1	583.0	385.5	483.4
Avg. Daily Flow 1000m ³	2.466	2.690	1.876	1.951	1.941	1.540	1.430	1.893	1.830	1.671	1.834	1.411	22.53	2.69	1.41	1.87
Raw Sewage Average																
Ammonia as N, mg/L	17	10	15.7	11	13.7	17	21.2	13	20.5	20.2	12	19.0		21.2	10.4	15.8
Nitrogen, T. Kjeldahl as N, mg/L	20	14.2	21	11	19	20	22.6	17.5	25	69.4	16	25		69.4	11.4	23.4
pH	7.77	8.16	8.68	8.20	8.55	8.06	7.92	8.90	8.54	8.16	8.20	8.42		8.90	7.77	8.30
Phosphorous, Total as P, mg/L	5.20	2.32	3.00	1.34	2.53	2.83	2.84	3.35	4.74	3.58	2.65	4.37		5.20	1.34	3.23
Solids, Suspended mg/L	105	61	74	47	155	50	63	53	121	177	81	75		177	47	89
Alkalinity CaCO ₃ , mg/L	360	365	475	394	433	325	298	550	488	462	440	563		562.5	298	429
CBOD ₅ , mg/L	82	79	114	64	89	86	65	105	160	143	112	151		160	64	104
Final Effluent Flow																
Total Flow 1000m ³	71.905	75.575	66.096	81.537	97.548	78.606	75.103	89.952	79.419	81.987	86.444	62.645	946.817	97.55	62.65	78.90
Avg. Daily Flow m ³	2319.51	2699.12	2132.13	2717.91	3146.70	2620.19	2422.67	2901.69	2647.28	2644.74	2881.47	2020.81		3146.70	2020.81	2596.19
Treated Peak Flow L/Sec	108.0	1470.9	131.0	144.0	121.0	99.0	105.0	143.0	144.0	120.0	116.0	80.0		1470.9	80.0	231.8
Final Effluent Average																
pH	7.8	8.0	7.9	7.7	7.4	7.2	7.3	7.3	7.2	7.4	7.6	7.7		8.0	7.2	7.5
Ammonia as N, mg/L	0.20	1.22	0.90	1.60	0.18	0.08	0.13	0.11	0.29	0.98	1.38	3.58		3.58	0.08	0.89
NH ₃ Un-ionized	0.0861	0.0203	0.0200	0.0194	0.0113	0.0026	0.0009	0.0019	0.0025	0.0063	0.0112	0.0317		0.0861	0.0009	0.0178
NH ₃ Un-ionized (FEDERAL)	0.0014	0.0195	0.0111	0.0171	0.0006	0.0006	0.002	0.011	0.003	0.026	0.015	0.073		0.073	0.001	0.015
Nitrogen, T. Kjeldahl as N, mg/L	0.9	2.3	1.5	2.2	1.1	0.9	0.5	0.5	0.9	1.2	2.3	4.3		4.3	0.4675	1.5
Nitrate as N, mg/L	11.0	7.5	6.9	9.4	7.4	5.6	6.2	6.8	6.0	7.6	6.1	6.3		11.0	5.6	7.2
Nitrite as N, mg/L	0.253	0.131	1.545	0.387	0.203	0.275	0.400	0.387	0.342	0.248	0.156	0.377		1.545	0.131	0.392
Phosphorous, Total as P, mg/L	0.31	0.42	0.40	0.28	0.30	0.38	0.38	0.33	0.60	0.71	0.69	0.95		0.95	0.28	0.48
Solids, Suspended mg/L	3	5	5	6	4	3	2	3	4	4	4	8		8	1.8	4
Alkalinity CaCO ₃ , mg/L	121	185	205	176	183	138	131	159	200	260	280	270		280	121	192
CBOD ₅ , mg/L	2.0	2.0	2.0	2.0	2.0	2.0	8.0	2.0	2.5	2.0	2.0	2.5		8	2.00	2.6
D.O. Avg. mg/L	6.35	4.90	4.34	5.53	4.37	3.06	3.31	3.40	2.96	3.03	4.17	3.59		6.35	2.96	4.08
Temperature C	9.3	9.8	10.5	11.8	17.7	21.0	23.9	24.7	23.2	18.9	14.6	12.6		24.7	9.3	16.5
E-Coil Average /100mL	10	10	10	10	15	13	10	10	10	13	10	44		44	10	13.7

	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	TOTAL	MAX	MIN	AVG
Orbal System																
Dissolved Oxygen Outer mg/L	0.70	1.02	0.65	1.16	0.28	4.60	0.79	0.46	n/a	0.72	0.70	0.53		4.60	0.28	1.05
Dissolved Oxygen Effluent mg/L	7.98	5.25	5.98	6.89	3.22	9.70	4.02	3.21	n/a	3.52	5.04	4.98		9.70	3.21	5.44
Temperature (Orbal Effluent) C	10.8	10.8	11.0	11.7	16.8	13.8	23.4	26.2	n/a	20.1	13.4	12.4		26.2	10.8	15.5
30 mins mg/L	113	111	104	91	121	120	120	160	140	150	160	111		160	91	125
MILSS mg/L	1561	1384	1421	1201	1472	1408	1479	1576	1360	1454	1614	1713		1713	1201	1470
MILVSS	1249	1050	1005	908	1093	1000	1016	1088	1021	1072	2429	1328		2429	908	1188
MILVSS %	80	76	71	76	74	72	67	69	74	88	139	78		139	67	80
SVI	72.7	77.9	71.8	75.6	83.4	86.4	80.4	107.5	102.4	102.2	98.3	67.1		107.5	67.1	85.5
F/M (BOD)	0.05	0.07	0.06	0.04	0.04	0.02	0.03	0.05	0.07	0.05	0.05	0.05		0.07	0.02	0.05
F/M (COD)	0.13	0.16	0.19	0.13	0.12	0.05	0.08	0.20	0.17	0.14	0.16	0.15		0.20	0.05	0.14
MCRT days	10.67	36.61	10.52	9.26	10.79	8.84	26.16	10.75	8.19	11.77	9.49	11.72		36.6	8.2	13.7
RAS																
Suspended Solids mg/L	2065	1924	1819	1637	2052	2029	1841	1981	1827	2041	2346	2171		2346	1637	1978
Volatile Suspended Solids mg/L	1595	1935	1231	1288	1581	1544	1306	1330	1348	1385	1828	1441		1935	1231	1484
Rvss %	76	93	72	75	75	75	71	67	73	68	76	67				
RAS Flow %	275	231	285	217	196	229	250	203	225	227	205	288		288	196	236
Alum																
Feed ml/min	400	401	384	386	304	317	334	314	395	419	412	432		432	304	375
Used Kg	7393.25	10582.44	11227.34	8587.24	7125.73	6585.85	5220.72	6306.15	6626.18	7485.12	7827.52	6467.73		11227.3	5220.7	7619.6
Dosage mg/L	100.8	168.2	214.0	153.4	117.0	145.9	120.2	111.0	133.2	147.3	142.8	148		214.0	100.8	141.8
Federal (Quarterly)																
Final Flow Qtr. m3	213576.2												257690.7	244473.7		231076.39
CBOD Qtr. mg/L	2.0												2.0	4.2		2.17
SS Qtr. mg/L	4.2												4.2	2.9		5.23
Number of Days	90												91	92		92
Federal WSER Acute Lethality																
Average Daily Volume Effluent (m ³):	2594															

Federal (Quarterly)																
Final Flow Qtr. m3	213576.2												257690.7	244473.7		231076.39
CBOD Qtr. mg/L	2.0												2.0	4.2		2.17
SS Qtr. mg/L	4.2												4.2	2.9		5.23
Number of Days	90												91	92		92

Federal WSER Acute Lethality																
Average Daily Volume Effluent (m ³):	2594															

APPENDIX B

Calibration Reports for the Reporting Period

CLIENT DETAIL		[MUT] MANUFACTURER	EQUIPMENT DETAIL
CUSTOMER	Municipality of Chatham-Kent	MODEL	ENDRESS & HAUSER
CONTACT	Randy Moynahan	CONVERTER S/N:	Promag 50P
	Senior Operator, Tilbury STP	FUSE	6A042716000
	20925 Clouthier St.		Pull Plug on Unit
	Tilbury, ON N0P 2L0	PLANT ID	Tilbury - Lyons Pumping Station
	T. 519-682-9033	METER ID	Raw Flow Meter
	C. 519-359-6906	FIT ID	FIT-102
	E. randym@chatham-kent.ca	CLIENT TAG	Flow Meter FIT-102
VER. BY - FM	Paris Machuk	OTHER	N/A
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was		GPS COORDINATES	N42 16.121 W082 26.133
		VERIFICATION DATE	March 15, 2018
		CAL. FREQUENCY	Annual
		CAL. DUE DATE	March, 2019

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	300	AS FOUND	2129498	M3
F.S. FLOW - MAG	LPS	706.838	AS LEFT	2129578	M3
F.S. RANGE - O/P	LPS	400.000	DIFFERENCE	80	M3
TUBE k-FACTOR		1.22970	TEST CRITERIA		
TUBE zero		0	AS FOUND CERTIFICATION TEST	Yes	
			FORWARD FLOW DIRECTION	Yes	
			ALLOWABLE [%] ERROR	5	
			COMPONENTS TESTED		
			CONVERTER DISPLAY	Yes	
			mA OUTPUT	Yes	
			TOTALIZER	Yes	
			ACCURACY BASED ON [% o.r.]	Yes	
			ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.		

FLOW TUBE SIMULATION							
		0.0	100.0	200.0	300.0	400.0	LPS
		0.0	14.1	28.3	42.4	56.6	% F.S. Flow
		0.0	25.0	50.0	75.0	100.0	% F.S. Range
REF. FLOW RATE		0.00	100.00	200.00	300.00	400.00	LPS
MUT [Reading]		0.00	99.45	198.82	298.13	397.38	LPS
MUT [Difference]		0.00	-0.55	-1.18	-1.87	-2.62	LPS
MUT [% Error]		n/a	-0.55	-0.59	-0.62	-0.66	%
mA OUTPUT		4.000	8.000	12.000	16.000	20.000	mA
MUT [Reading]	min. 4 mA	3.995	7.968	11.942	15.902	19.880	mA
MUT [Difference]	max. 20 mA	-0.005	-0.032	-0.058	-0.098	-0.120	mA
MUT [% Error]		-0.12	-0.40	-0.48	-0.61	-0.60	%
TOTALIZER				REF. FLOW RATE		400.000	LPS
				TOTALIZER [MUT]		30.0	M3
				TEST TIME		75.53	SECONDS
				TOTALIZER [REF]		30.212	M3
				ERROR		-0.71	%

COMMENTS	QUALITY MANAGEMENT STANDARDS INFO.			RESULTS		
	[QMS] INFORMATION	IDENT.	ID #	TEST	AVG % o.r.	PASS FAIL
	[REFERENCE] FTS	E&H-FC	1	DISPLAY	-0.60	PASS
	PROCESS METER	DMM	2	mA OUTPUT	-0.44	PASS
	ANALOG METER	AM	N/A	TOTALIZER	-0.71	PASS
	STOP WATCH	SW	Yes			

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

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Municipality of Chatham-Kent
CONTACT Randy Moynahan
Senior Operator, Tilbury STP
20925 Clouthier St.
Tilbury, ON N0P 2L0
T. 519-682-9033
C. 519-359-6906
E. randym@chatham-kent.ca

EQUIPMENT DETAIL

[MUT] MANUFACTURER Milltronics
MODEL OCMIII
CONVERTER SERIAL NUMBER 082204105XV

PLANT ID Tilbury STP
METER ID Final Effluent
FIT ID FIT-701
CLIENT TAG Flow Meter FIT-701
OTHER N/A
GPS COORDINATES N42 16.344 W082 26.874

VER. BY - FM Paris Machuk

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

VERIFICATION DATE March 15, 2018
CAL. FREQUENCY Annual
CAL. DUE DATE March, 2019

PROGRAMMING PARAMETERS

THROAT DIMENSION (DN)	inches	12
EMPTY DISTANCE	m	1.204
MAX. HEAD	m	0.762
DEAD ZONE	m	0.137
BLANKING DISTANCE	m	0.305
MAX. FLOW	LPS	456.8
F.S. RANGE - O/P	LPS	456.8

TOTALIZER

AS FOUND	13148703	M3
AS LEFT	13148869	M3
DIFFERENCE	166	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	Yes
mA OUTPUT	Yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	No

Ultrasonic sensor installed to ensure full scale flow condition

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

AS FOUND TEST RESULTS

		0.0	13.1	37.5	69.5	97.6	% F.S. Range
		0.000	0.200	0.400	0.600	0.750	m
REF. FLOW RATE		0.000	59.646	171.297	317.513	445.922	LPS
MUT [Reading]		0.212	60.350	171.977	318.458	444.880	LPS
MUT [Difference]		0.212	0.704	0.680	0.945	-1.042	LPS
MUT [% Error]		n/a	0.15	0.15	0.21	-0.23	%
mA OUTPUT		4.000	6.089	10.000	15.121	19.618	mA
MUT [Reading]	min. 4.000 mA	3.984	6.093	10.021	15.164	19.604	mA
MUT [Difference]	max. 20.000 mA	-0.016	0.004	0.021	0.043	-0.014	mA
MUT [% Error]		-0.08	0.02	0.11	0.22	-0.07	%
TOTALIZER - REF. FLOW RATE						445.922	LPS
TOTALIZER [MUT]						51	M3
TEST TIME						113.94	SECONDS
CALC. TOTALIZER						50.808	M3
ERROR						0.38	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD n/a
PROCESS METER	DMM 2
STOP WATCH	SW Yes

RESULTS

TEST	AVG %FS	PASS FAIL
DISPLAY	0.07	PASS
mA OUTPUT	0.04	PASS
TOTALIZER	0.38	PASS

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

PASS

AS FOUND CERTIFICATION

CUSTOMER CONTACT	Municipality of Chatham-Kent Randy Moynahan Senior Operator - Tilbury 20925 Road 303 - Lakeshore Tilbury, Ontario N0P 2L0 T: 519-359-6906 E: randym@chatham-kent.ca	[MUT] MANUFACTURER MODEL SERIAL NUMBER CLIENT TAG LOCATION OTHER	HACH DR3900 1604407 n/a STP n/a
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VER. BY	Randy Nichol	TOLERANCE [mg/L]	0.05
		STANDARD RECOVERY [%]	90

Quality Management Standards Information - Standards, reference equipment, and instrumentation used to conduct this test outlining the lot#, and expiry date is found in our current	VERIFICATION DATE	March 26, 2018
	CAL. FREQUENCY	Annual
	CAL. DUE DATE	March-2019

CHLORINE [Cl₂] SECONDARY STANDARDS

STANDARD	BLANK [mg/L]			READING mg/L	PASS FAIL
		+/-			
STD 1	0.24	+/-	0.09	0.25	PASS
STD 2	0.91	+/-	0.10	0.94	PASS
STD 3	1.64	+/-	0.14	1.69	PASS

CHLORINE [Cl₂] PRIMARY STANDARDS

STANDARD VALUE [mg/L]	27.3	BLANK SAMPLE SIZE [mL]	10.0
STANDARD ADDITIONS SIZE [mL]	0.200	DPD LOT#	A7325
		EXPIRY DATE	Nov-22

SAMPLE TEST #	Cl ₂ STANDARD mL	COMBINED SAMPLE mL	REFERENCE STANDARD mg/L	REFERENCE READING mg/L	MUT READING mg/L	DIFF. ERROR mg/L	PASS FAIL	STANDARD RECOVERY %
BLANK	0	10.000	0	0	0	0	PASS	N/A
STD 1	0.200	10.200	0.54	0.52	0.52	0.00	PASS	96.3
STD 2	0.400	10.400	1.05	0.99	1.01	0.02	PASS	94.3
STD 3	0.600	10.600	1.55	1.44	1.47	0.03	PASS	92.9
AVERAGE RESULTS						0.02	PASS	94.5

COMMENTS	[QMS] INFORMATION	ITEM	ID #
	[REFERENCE] HACH PCII	HACH PC II	1
	10.0 mL PIPETTE	HACH-PP-10	1
	0.2 mL PIPETTE	G-PP-2	1
	SECONDARY STANDARDS	AS-CLSS	1
	PRIMARY STANDARDS	AS-CLPS	1
	ABSORBANCE STANDARDS	AS-ABS	1

ABSORBANCE CHECKS		
WAVELENGTH	TESTED	PASS/FAIL
420 nm	Yes	PASS
520 nm	Yes	PASS
560 nm	Yes	PASS
610 nm	Yes	PASS

Primary and Secondary standards were used to confirm the overall accuracy of this instrument along with conducting an analytical comparative technique against a reference meter. All values are considered "AS FOUND" readings. If the "AS FOUND" readings were not within acceptable limits, an "AS LEFT" report will be issued if the instrument was able to be calibrated to indicate the overall accuracy of the meter. If the meter was not calibrated for any reason, a comment will be issued for this instrument.

CUSTOMER CONTACT	Municipality of Chatham-Kent Randy Moynahan Senior Operator - Tilbury 20925 Road 303 - Lakeshore Tilbury, Ontario N0P 2L0 T: 519-359-6906 E: randym@chatham-kent.ca	[MUT] MANUFACTURER	HACH
		MODEL	HQ30D
		SERIAL NUMBER	080200018124
		CLIENT TAG	n/a
		LOCATION	Tilbury WPCP
		OTHER	n/a

VER. BY *Randy Nichol*

Quality Management Standards Information - Standards, reference equipment, and instrumentation used to conduct this test outlining the lot#, and expiry date is found in our current

VERIFICATION DATE	March 26, 2018
CAL. FREQUENCY	Annual
CAL. DUE DATE	March-2019

AS FOUND

Time	n/a
DO Concentration [%]	111.8
DO Concentration [mg/L]	11.15
Temperature	14.8
hpa	1005

AS LEFT

Time	n/a
DO Concentration [%]	92.5
DO Concentration [mg/L]	10
Temperature	14.9
hpa	1005

COMMENTS

Calibrated as per the manufacturers suggested practice

QMSI INFORMATION

ITEM

ID



NIST Traceable Buffers were used to confirm the overall accuracy of this instrument. "AS FOUND" readings and "AS FOUND" readings are reported within this report. A temperature device was used to measure and record the buffer temperature to correct for pH values due to the effects related to buffer temperature.

CUSTOMER CONTACT Municipality of Chatham-Kent
 Randy Moynahan
 Senior Operator - Tilbury
 20925 Road 303 - Lakeshore
 Tilbury, Ontario N0P 2L0
 T: 519-359-6906
 E: randym@chatham-kent.ca

[MUT] MANUFACTURER Aysix
MODEL 3100
SERIAL NUMBER 3057385
CLIENT TAG n/a
LOCATION Tilbury WPCP
OTHER n/a

VER. BY *Randy Nichol*

Quality Management Standards Information -
 Standards, reference equipment, and
 instrumentation used to conduct this test outlining
 the lot#, and expiry date is found in our current

VERIFICATION DATE March 26, 2018
CAL. FREQUENCY Annual
CAL. DUE DATE March 2019

AS FOUND

Time	n/a
DO Concentration [%]	n/a
DO Concentration [mg/L]	7.5
Temperature	20.2
hpa	n/a

AS LEFT

Time	n/a
DO Concentration [%]	n/a
DO Concentration [mg/L]	10
Temperature	20.2
hpa	n/a

COMMENTS

Calibrated as per the manufacturers suggested practice
 used HQ30D as comparison.

QMSI INFORMATION

ITEM

ID #

NIST Traceable Buffers were used to confirm the overall accuracy of this instrument. "AS FOUND" readings and "AS FOUND" readings are reported within this report. A temperature device was used to measure and record the buffer temperature to correct for pH values due to the effects related to buffer temperature.

