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The Municipality of Trent Hills

ANNUAL REPORT

Warkworth Waste Stabilization Ponds and Collection System 2020

Prepared by

Wastewater Operations Department

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Section 11(4) of the Environmental Compliance Approval no.6023-BDQR6H, for the Warkworth Waste Stabilization Ponds states, "The owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:

- (a) A summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
- (b) A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this approval, including an overview of the success and adequacy of the Works;
- (c) A summary of all operating issues encountered and corrective actions taken;
- (d) A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- (e) A summary of any effluent quality assurance or control measures taken;
- (f) A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- (g) A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
 - i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality
 - ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- (h) A tabulation of the volume of sludge generated, 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; a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location;
- (i) A summary of any complaints received and any steps taken to address the complaints;
- (j) A summary of all By-passes, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- (k) A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report status of implementation of all modification.
- (l) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the following year following that for which the report is submitted.

Note: This annual report is combined with ECA #0672-BFNR7G Warkworth Collection System Section 8 (3) (a-g)

Section 1 – ECA Condition 11 (4) (a)

A summary of all monitoring data collected at the Warkworth Stabilization Ponds during the reporting period can be found in Appendix I. The summary, or Performance Report provides Flow data, Raw sewage and Final effluent analytical results and an Effluent loadings summary.

Below is a summary of the Influent Data. During the spring and winter months in the reporting year flows are elevated due to infiltration and inflow, which historically is consistent. The flushing and CCTV program is being followed up immediately with repairs and problem areas of infiltration are being identified.

Warkworth - Monthly Average Influent Flows - 2020												
Flows	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Flow Avg. (m3/d)	264	210	325	293	222	164	156	159	146	217	159	186
Flow Min. (m3/d)	188	183	224	226	132	90	131	131	129	171	142	161
Flow Max. (m3/d)	494	246	470	434	322	245	179	188	168	285	187	257
Flow Total (m3)	8190	6104	10088	8799	6896	4909	4851	4928	4381	6740	4775	5781

The chart below summarizes the Monthly Influent Monitoring.

Warkworth - Monthly Average Influent Monitoring - 2020												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
BOD5	441	370	116	194	161	210	76	318	189	439	230	1920
Total Phosphorous	7.04	5.63	2.39	4.77	3.37	3.36	4.28	6.84	5	6.89	5.29	35.6
Total Suspended Solids	994	358	668	128	925	83	172	151	192	241	152	1450
Total Kjeldahl Nitrogen	53.8	45.7	20.3	47.2	25.9	34.8	29.6	59.9	55	58.1	58	119

Section 2 – ECA Condition 11 (4) (b)

The spring release reported a Non-Compliance for exceedance of Total Ammonia-Nitrogen Limit of 3.0 mg/L. The actual average for the release was 5.72 mg/L. Extra sampling was conducted during the discharge. The cause of the exceedance was attributed to weather as we did not receive increasing temperatures until late in the discharge thus not allowing enough time for proper nitrification to occur. This was reported to the MOECP immediately in accordance with Section 11(1) of Environmental Compliance Approval (ECA) 6023-BDQ6RH.

Effluent quantity and quality criteria stipulated in ECA Condition 7(1) Schedule C are summarized as follow:

Spring Release

East CELL	2020		East				Lab Samples					On Site			Comments		
	MONTH/DATE	WEATHER	2020	CELL	DISCHARGE		TOTAL	Total	pH	CBOD5	un-ionized	TSS	Sol.P	pH		Temp	
		C ³	OPERATOR	DEPTH	M ₃	IN."	M ₃	PHOS.	AMMONIA		mg/L	ammonia					
April 20/20	sunny	2	SM	57.0	41,610			0.05	8.0	8	4	0.228	17	0.19	8.1	10	Start release @0730
April 21/20	Overcast	3	SM	54.5	39,785	2.5	1825							0.01	7.57	10.4	
April 22/20	Windy	1	SM	51.5	37,595	3.0	2,190							0.01	7.54	8.8	
April 23/20	Sunny	1	TS	48.5	35,405	3.0	2,190							0.02	8.1	7.4	
April 24/20	Overcast	5	TS	45.5	33,215	3.0	2,190							0.01	7.78	7.7	
April 25/20	Sunny	0	TS	42.5	31,025	3.0	2,190							0.01	7.78	9.3	
April 26/20	Overcast	9	TS	39.5	28,835	3.0	2,190							0.02	7.62	9.1	
April 27/20	Overcast	4	AF	36.5	26,645	3.0	2,190	0.04	7.6	8.05	<4	0.194	3	0.01	7.57	9.6	Collect middle samples
April 28/20	Overcast	3	TS	35.0	25,550	1.5	1,095							0.02	7.5	11.3	
April 29/20	Overcast		AF	32.5	23,725	2.5	1,825							0.02	7.46	12.2	
April 30/20	Rain		AF	31.0	22,630	1.5	1,095							0.02	7.49	12	
			Total for April			26.0	18980										Total hours for April 256.5
May 1/20	Overcast	11	TS	30.0	21,900	1.0	730							0.01	7.48	12.8	
May 2/20	Sunny	11	TS	29.0	21,170	1.0	730							0.03	7.37	13.4	
May 3/20	Sunny	10	TS	27.0	19,710	2.0	1,460							0.02	7.44	15	
May 4/20	Overcast	7	TS	24.0	17,520	3.0	2,190	0.04	6.5	8.39	4	0.237	2	0.03	7.44	16	Collect middle samples
May 5/20	Sunny	2	TS	22.0	16,060	2.0	1,460							0.03	7.42	12	
May 6/20	Overcast		AF	19.0	13,870	3.0	2,190							0.01	7.41	11.5	
May 7/20	Windy		AF	17.0	12,410	2.0	1,460							0.03	7.33	15.3	
May 8/20	Windy		AF	17.0	12,410	0.0	0							0.01	7.46	8.4	
May 9/20	Cold		AF	16.0	11,680	1.0	730							0.01	7.52	7.3	
May 10/20	Sunny		AF	14.0	10,220	2.0	1,460							0.07	7.52	7.3	
May 11/20	Rain		SM	14.0	10,220	0.0	0	<0.03	3.8	8.03	<4	0.094	<2	0	7.39	10.2	Collect middle samples
May 12/20	Sunny		SM	11.0	8,030	3.0	2,190							0.08	7.47	9.6	
May 13/20	Sunny		SM	6.0	4,380	5.0	3,650	<0.03	2.7	7.99	<2	0.064	2	0.1	7.32	9.4	Collect end samples
			Total for May			25.0	18,250										Total hours for May 295.5
			TOTAL				37,230										
			MINIMUM				0			7.99							Total release hours 552 hrs.
			MAXIMUM				3,650			8.4							
			AVERAGE				1,551	0.038	5.72	8	3.6	0.163	5.2				

Fall Release

West CELL	2020		East				Lab Samples					On Site			Comments		
	MONTH/DATE	WEATHER	2020	CELL	DISCHARGE		TOTAL	Total	pH	CBOD5	un-ionized	TSS	Sol.P	pH		Temp	
		C ³	OPERATOR	DEPTH	M ₃	IN."	M ₃	PHOS.	AMMONIA		mg/L	ammonia					
Nov.2/20	Windy	-2	SM	37.0	27,010	1	730	0.05	0.5	8.2	11	0.019	44	0.04	8.2	3.9	0735 Start release, collect samples
Nov.3/20	Overcast	1	SM	36.0	26,280	0.5	365							0.03	8.24	3.1	
Nov.4/20	Sunny	3	SM	35.5	25,915	1.0	730							0.07	8.21	4.1	
Nov.5/20	Sunny	13	SM	34.5	25,185	1.5	1,095							0.06	8.24	4.4	
Nov.6/20	Sunny	16	SM	33.0	24,090									0	8.29	14.7	1400 Stopped Release
Nov.9/20	Sunny	12	SM	33.0	24,090	1.0	730							0.02	8.27	14.1	0830 Start Release
Nov.10/20	Sunny	10	SM	32.0	23,360	2.0	1,460							0	8.66	9.8	
Nov.11/20	Drizzle	12	SM	30.0	21,900			0.06	0.4	8.24	12	0.009	39	0.03	8.24	13.8	0815 Stop release due to lab result and possible turnover
Nov.23/20	Cloudy	-1	SM	30.5	22,265	2.0	1,460	0.05	1	8.09	8	0.027	20	0.02	8.09	4.6	0750 Start Release. Collect sample
Nov.24/20	Overcast	-2	SM	28.5	20,805	1.0	730	0.04	1	8	7	0.024	15	0.12	8	2	Collect samples
Nov.25/20	Overcast	0	SM	27.5	20,075	1.0	730	0.04	1	8.18	5	0.022	13	0.12	8.18	1	Collect Samples
Nov.26/20	Cloudy	5	SM	26.5	19,345	1.0	730	0.04	0.9	8.3	9	0.028	10	0.02	8.3	3.1	Collect samples
Nov.27/20	Overcast	2	AF	25.5	18,615	1.0	730							0.04	8.15	3.9	
Nov.28/20	Overcast	3	AF	24.5	17,885	1.0	730							0.05	8.2	4.6	
Nov.29/20	Sunny	1	AF	23.5	17,155	5.5	4,015							0.08	7.95	4.9	
Nov.30/20	Cloudy	1	SM	18.0	13,140			0.11	1	7.7	6	0.013	12	0.1	7.7	9.5	Collect samples, Stopped release at 1630
			TOTAL			19.5	14,235										
			MINIMUM			0.5	365	0.04	0.4	7.7	5	0.009	10		7.7		Total release hours :327
			MAXIMUM			5.5	4,015	0.11	1.0	8.3	12.0	0.028	44		8.66		
			AVERAGE			1.2	883	0.050	0.50	8	8.3	0.020	21.8		8.18		

Section 3 - ECA Condition 11(4) (c)

The spring release as indicated in Section 2 exceeded in Total Ammonia-Nitrogen due to temperatures and abnormal spring temperatures.

The fall release faced similar obstacles in that during the month of October we received abnormally elevated temperatures, which caused the lagoon to turnover. The lagoon release was delayed until November. This resulted in higher than usual suspended solids results. Operations staff completed extra sampling during this time and compliance was met.

Section 4 – ECA Condition 11(4) (d)

Normal maintenance occurred on all pumps and no emergency repairs had to be completed.

Section 5 – ECA Condition 11 (4) (e)

Effluent control measures and quality assurance include taking pre-release samples beginning at least one month before the scheduled release. If all parameters are compliant then a release is started and as a contingency, alum can be added to the lagoon prior to release for pre-treatment. Although this has not been required in recent years, alum was required for the Fall release in 2020 due to an inability to settle the suspended solids. Because of the ongoing collection CCTV and flushing program, flows have decreased enough to use one lagoon per season and allow the other to remain idle for half of the year, giving more time for treatment. Operators also do in house testing during releases. In house testing provides real time results, which enhance process and operational performance. All in house sampling and analysis is performed by certified operators utilizing methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Standard Methods for the Examination of Water and Wastewater".

All effluent samples collected during the reporting period to meet C of A sampling requirements were analyzed by SGS Lakefield, with the exception of pH and temperature. SGS Lakefield has been deemed by the Canadian Association for Laboratory Accreditation (CALA) to be an accredited laboratory, meeting strict provincial guidelines including an extensive quality assurance/quality control program.

Section 6 – ECA Condition 11(4) (f)

The Worktech system automatically generates work orders and schedules calibration and certification of Flowmeters and lab equipment.

These calibrations are carried out by a certified, third party qualified technician and performed on an annual basis. A copy of the 2020 Annual Calibration Record for the influent flow meter is located in Appendix II.

Section 7 – ECA Condition 11(4) (g)

Condition 6 – Effluent Objectives, subsection (1) (c) states, “The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance to the following objectives: c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.”

The following table provides a comparison of the rated capacity of the works to the actual flow data obtained during the 2020 reporting period.

Warkworth - Monthly Flow Monitoring - 2020												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Average Daily Flow m3/d	264	210	325	293	222	164	156	159	146	217	159	186
Rated Capacity m3/d	390	390	390	390	390	390	390	390	390	390	390	390

The above table shows that the Warkworth Wastewater Stabilization Lagoons ECA rated capacity was not exceeded during 2020. The Annual Average Daily Influent Flow of 209.43 m3/day is 54% of the Rated Capacity of the Sewage Treatment Plant of 390 m3/d.

Section 8 – ECA Condition 11 (4) (h)

During the 2020 reporting year there were zero biosolids removed from the lagoons and there will be no biosolids removed in the upcoming year. It is estimated that each lagoon has a thirty (30) year capacity for biosolids and they were dredged in 2012 (West lagoon) and 2013 (East lagoon). Operations staff have created work orders to tabulate the volume of sludge accumulated to date and this was completed in the August of 2020 as per ECA # 6023-BDQR6H.

Warkworth WPC - Biosolids Summary 2020			
	Average Sludge Depth inches	m3/Inch	Volume of Biosolids m3
East Lagoon	8.69	730	6344
West Lagoon	12.8	730	9344
	Total		15 688

Section 9 – ECA Condition 11 (4) (i)

There were no community complaints received during the 2020 reporting period.

Section 10 – ECA Condition 11 (4) (j)

There were no by-pass, spills or abnormal discharge events during the 2020 reporting period.

Section 11 – ECA Condition 11 (4) (k)

There were no Notice of Modification to Sewage Works forms completed during the 2020 reporting period.

Section 12 – ECA Condition 11 (4) (l)

The Warkworth collection system has not experienced Bypass/Overflow situations in recent years and the Sewer system is 100% separated. In efforts to eliminate the possibility of Overflow/Bypass events as well as Inflow and Infiltration in the system, the Municipality has a multi-year plan in place to flush and CCTV a portion of the system each year. This means that all areas of the wastewater collection systems in Trent Hills are flushed, and CCTV inspected over a seven (7) year maintenance cycle. Areas identified for repair, are completed immediately or in some situations are identified for future rehabilitation.

During periods of elevated flow, municipal staff complete flow monitoring to identify areas of concern.

The Municipal budget for CCTV and flushing will remain at \$57,000 for the three (3) systems within the Municipality of Trent Hills and \$23,000 for repairs.

Any questions regarding the information contained in this report should be directed to the undersigned at 705-653-7113

Troy Stephens,
Wastewater Treatment/Collection Head Operator,
Municipality of Trent Hills

Appendix I

2020 Warkworth Performance Report

Warkworth WPC 2020 Performance Summary

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Average	Min	Max
Flow Avg. (m3/d)	173	183	210	307	387	219	170	157	161	155	174	210		208.83		
Flow Min. (m3/d)	116	149	167	187	282	179	150	125	135	101	154	165			101	
Flow Max. (m3/d)	239	310	360	494	521	303	217	214	199	239	198	276				521
Flow Total (m3)	5375	5115	6499	9209	11993	6563	5280	4872	4819	4812	5231	6509	76277	6356.42		
Water plant flow	4361	4018	4673	4184	5082	4723	6382	5067	5132	5215	4340					
% increase	23	27.3	39.07	120	136	39	-17	-3.84	-6.09	-7.72	20.52					
Raw Filtered Ammonia	46.1	23	52.7	30.4	21	10	52.8	27.2	30.6	50.8	50.1	21.8		34.71		
Raw BOD5	223	448	265	175	104	328	235	223	187	344	345	160		253.08		
Raw Phosphorous	4.32	4.52	6.62	2.99	2.38	2.32	7	4.3	3.87	6.9	5.73	3.12		4.51		
Raw Suspended Solids	139	570	262	113	176	151	236	525	160	374	51	343		258.33		
Raw TKN	49.6	30.7	59.3	29.2	28.3	15.6	61.2	35.4	39.2	59.3	62.6	35.5		42.16		
Raw # Samples	1	1	1	1	1	1	1	1	1	1	1	1	12			
Total Effluent Release				16790	15330					6205	14235		52560			
Cell				East	East					West	West					
Flow Duration Hours				183.5	176.75					185	212		757.25			
BOD				5	5					<4	<2					
CBOD				5	4.5					LE	4					
TSS				8	6.5					11	9.5					
Filtered Ammonia				0.8	1.15					0.2	0.35					
Unionized Ammonia				0.027	0.031					0.009	0.01					
Total Phos				0.03	0.05					0.04	0.05					

APPENDIX II

2020 Warkworth WWTF Calibration Report

Tower Electronics Canada Calibration Certificate

Customer:

Troy Stephens
 Wastewater Collection/Treatment Plant Head Operator
 Municipality of Trent Hills
 705-653-1870

Calibration by:

Dan Matchett

Standards:

Fluke 289 S/N 96220182 NIST Cal Due Jan 2021

Instrument Type

Clamp-on Doppler Flow

Method of verification

Volumetric verification

Units: LPS

Zero: 0.00

Span: 50.00

Totalizer: n/a **Flow Test**

Meter Information

Date of Test: 4/29/2020
 Location: Warkworth SPS
 Meter Under Test: Raw Flow
 Client Tag: n/a
 Manufacturer: Greyline
 Model: DFM 5.1
 Serial Number: 17048
 Totalizer As Found: 6187783L
 Totalizer As Left: 6194699L

Programming Parameters:

DN Size: 6.04" ID
 Cal Factor: 0.975
 Zero Cal: 0
 Allowable Error: 15%
 Calibration Due: April 2021

Sim Setting	Sim Flow LPS	Meter Display	SCADA	Disp Error%	SCADAErr%	
0.000	0.000	0.000	0.000	0.000	0.000	
12.500	12.500	12.500	12.510	0.000	0.020	
25.000	25.000	25.000	25.020	0.000	0.040	
37.500	37.500	37.500	37.520	0.000	0.040	
50.000	50.000	50.000	50.000	0.000	0.000	
				Average Error%	0.00	0.02
				Result:	PASS	PASS

Draw Down Test

Chamber Volume Pumped	4113.000	L
Start Totalizer	6190798.000	L
End Totalizer	6194678.000	L
Volume Recorded By Meter	3880.000	L
Volume Difference	233.000	
Error%	6.005	
Result:	PASS	

Comments:

Unit passes verification,
 Volumetric/Draw down test using wet well chamber 2.4m Circ(10cm depth = 0.49M3)

