PERFORMANCE REPORT 2021

ST. THOMAS WATER POLLUTION CONTROL PLANT

2021 Annual Performance Report

Amended Environmental Compliance Approval

Number# 6122-BRHL4L (July28,2020-Present)
For the Period:
January 1st to December 31st, 2021

Prepared by: Joe Daly

ST. THOMAS
THE RAILWAY CITY

Table of Contents

1 Monitoring Data Overview:

For the purposes of this report the St. Thomas Water Pollution Control Plant shall be referred to as 'the plant' and Ontario Ministry of the Environment, Conservation and Parks Amended Environmental Compliance Approval 6122-BRHL4L shall be referred to as the 'ECA'.

The average and peak daily sewage flow limits, 27,300 m^3/day/year and 54,600 m^3/day respectively, as set out in the ECA, were always maintained throughout 2021, with an annual average day flow of 18,078 m^3/day and a peak day flow of 40,510 m^3/day in September 2021.

Throughout 2021, the monthly average of all sample parameters were within ECA limits. Objective exceedances occurred on 3 monthly averages listed in the graph below.

2021 Compliance Report

Month/ Date	Location	Parameter	Objective/ Limit	ECA Concentration Objective	ECA Concentration Limit	WPCP Monthly Average/ Single Sample Result	Description/ Details	Response/ Corrective Action
February	WPCP	Total Ammonia Nitrogen	Objective	3.0 mg/L (Dec 1-Apr 30)	5.0 mg/L	4.9 mg/L	Cause of exceedance is suspected of a low Sludge Retention Time from wasting the aeration tanks for too long	Chief Operator decreased wasting to increase Sludge Retention Time and started Hoffman Blower #2 to increase the Dissolved Oxygen. Ammonia tested on Final Effluent grab sample Feb 26th with a results of 3.2 mg/L and Feb 28th, 2.7 mg/L
March	WPCP	pH	Objective	6.5-8.5 inclusive	6.0-9.5 inclusive	6.44	Single sample result under Objective on March 16, 2016	Inhouse lab results on March 16, 2021: Influent pH was 7, Effluent pH was 6.44. Alum dose was 800 mL/min, turned down to 750 mL/min. Certified lab results of Effluent was 7.4. March 11, 2021 inhouse Effluent pH was 7.3, on March 18, Effluent pH was 7.24
October	WPCP	E. Coli	Objective	150 CFU/100 mL	200 CFU/100 mL	161 CFU/100 mL	Monthly Geomean over Objective	The cause of higher E.coli results in the month of October is due to wet weather events causing higher than normal flows through the plant. Regular cleaning on the UV system was unable to be performed due to high flows as both banks were needing to run.

In 2021 there were a total of 5 odour complaints received from 4 different residents. Odour surveys were conducted at the Water Pollution Control Plant and surrounding areas throughout the year, most of which concluded no to minimum odours coming from the WPCP. Strong winds, planned or emergency maintenance, and cleaning of the Plant may create stronger than normal odours. Most odours that were detected during these surveys came from different sources, including: Solids Treatment Process, Agricultural and Local Landfills. The City has completed several studies and is in the process of adding additional odour control systems to the plant.

There were 6 instances which were momentary where disinfection was not continuous as detailed in the Table 5-Summary of Effluent Quality Control and Environmental Operating Issues. There was 1 issue where aeration was lost for a period of time in plant 4 causing temporary loss of treatment, disinfection was continuous throughout this event. No other diversions of sewage from any portion of the Water Pollution Control Plant.

As indicated by the data presented in this report, the operations of the St. Thomas Water Pollution Control Plant were both adequate and successful throughout 2021.

The following tables, Table 1 through 4, represent a summary of monitoring data collected at the plant throughout 2021:

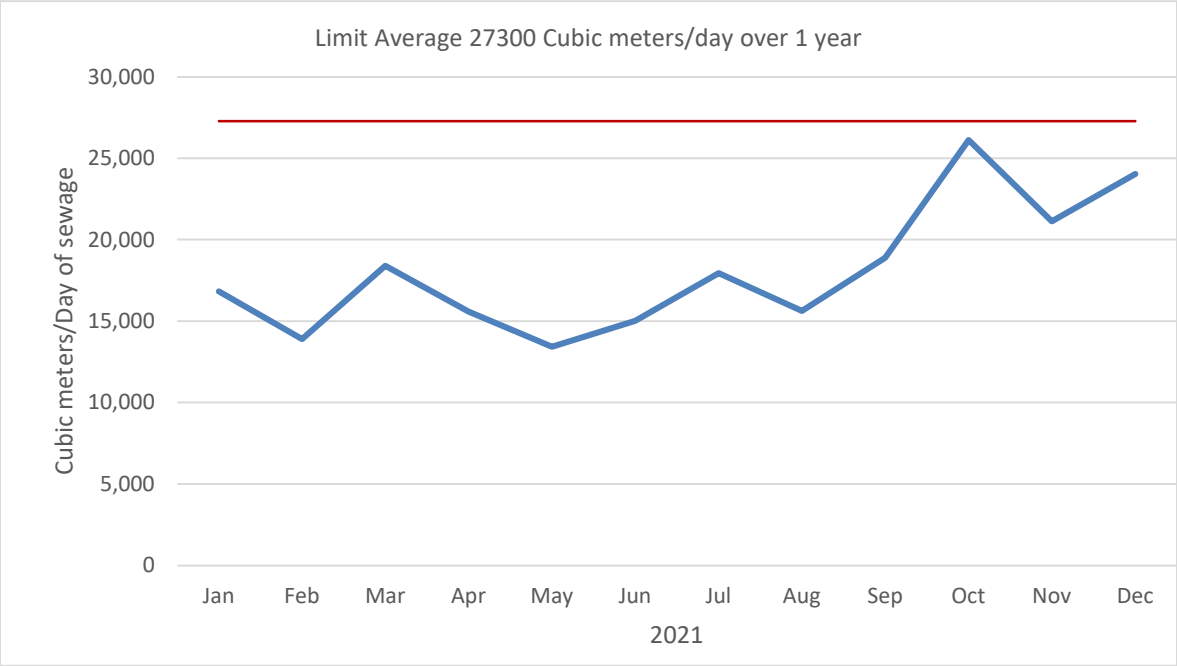
1.1 Table 1 – Daily Sewage Flow Summary

Date	January Flow (m3)	February Flow (m3)	March Flow (m3)	April Flow (m3)	May Flow (m3)	June Flow (m3)	July Flow (m3)	August Flow (m3)	September Flow (m3)	October Flow (m3)	November Flow (m3)	December Flow (m3)
1	21,751	12,910	31,117	16,499	14,802	12,139	32,355	16,387	12,985	16,885	26,304	25,246
2	33,573	12,639	22,289	16,258	14,305	13,480	21,369	15,373	12,718	16,374	23,450	31,572
3	28,899	12,602	20,753	15,500	17,647	21,469	18,805	14,623	12,350	28,213	20,915	24,950
4	25,179	12,451	20,705	15,180	17,004	14,105	17,062	14,064	12,344	32,901	19,738	22,171
5	22,947	12,415	18,887	15,135	15,157	13,071	16,269	13,734	13,642	22,370	18,441	23,900
6	20,599	12,583	17,884	14,539	14,310	12,627	15,137	13,388	13,174	20,131	17,946	38,856
7	19,337	12,689	17,192	14,150	14,445	12,740	17,200	13,132	13,928	18,987	18,160	32,543
8	18,469	12,482	16,248	13,878	14,358	12,691	19,531	13,071	18,288	34,730	16,587	26,000
9	17,501	12,168	16,770	16,516	13,829	12,204	17,181	14,132	13,556	30,566	16,053	23,098
10	16,981	12,140	17,798	14,599	13,671	11,838	15,020	17,451	12,728	28,146	15,859	21,369
11	16,274	12,279	19,254	20,511	13,242	11,639	16,407	21,850	12,428	24,963	16,904	35,978
12	15,513	12,121	17,967	19,681	12,993	11,299	15,025	21,850	13,867	21,632	23,850	36,789
13	15,265	12,132	17,316	15,966	12,695	11,569	14,229	15,093	30,325	19,588	18,359	28,596
14	15,074	11,984	16,753	15,966	12,554	13,045	13,735	15,093	18,193	18,695	20,902	25,111
15	15,265	12,235	15,154	15,313	12,431	11,767	13,639	14,232	17,582	26,902	27,212	23,336
16	15,036	11,854	16,064	14,899	12,545	11,327	16,694	14,631	15,081	38,927	24,043	21,800
17	14,733	11,786	15,421	14,394	12,360	11,235	31,393	14,135	14,233	34,560	21,468	20,217
18	14,420	11,767	14,954	14,540	12,101	12,472	20,752	14,832	13,534	25,454	25,085	21,909
19	14,209	11,877	14,610	14,668	11,966	11,288	17,325	13,968	13,421	22,704	20,548	19,920
20	14,016	11,911	14,652	15,411	11,625	11,242	15,794	13,431	12,978	20,968	19,484	19,148
21	13,954	12,139	14,651	17,417	11,719	17,937	14,693	12,905	17,311	24,146	20,878	18,386
22	13,727	13,167	14,055	15,955	12,046	12,437	14,082	20,589	39,624	22,307	19,951	17,918
23	13,676	15,406	13,816	14,948	11,447	11,737	13,503	26,511	40,510	20,027	18,208	17,608
24	13,700	19,060	13,408	14,305	11,785	11,505	21,095	17,323	39,054	19,774	17,339	18,086
25	13,501	17,258	13,273	14,176	11,907	15,041	16,165	15,907	29,379	34,301	26,700	26,389
26	13,214	15,632	34,462	13,893	11,534	40,048	14,703	14,991	24,636	36,162	27,181	21,468
27	13,195	25,680	21,169	13,322	11,536	25,554	13,852	14,321	22,366	25,882	22,711	19,859
28	12,771	25,745	25,882	14,018	20,669	18,610	13,889	13,881	19,959	22,925	22,602	19,798
29	12,711		21,135	17,981	14,206	21,593	27,005	14,788	18,619	28,192	22,772	21,161
30	13,161		18,959	16,172	12,877	23,085	25,168	15,124	17,707	38,815	24,297	20,924
31	13,283		17,881		12,547		17,511	13,643		34,001		20,924
Total	**521,775**	**389,112**	**570,479**	**467,438**	**416,313**	**450,794**	**556,588**	**484,453**	**566,520**	**810,228**	**633,947**	**745,030**
Average	16,831	13,897	18,403	15,581	13,429	15,026	17,954	15,628	18,884	26,136	21,132	24,033
Maximum	33,573	25,745	34,462	20,511	20,669	40,048	32,355	26,511	40,510	38,927	27,212	38,856
Minimum	12,711	11,767	13,273	13,322	11,447	11,235	13,503	12,905	12,344	16,374	15,859	17,608

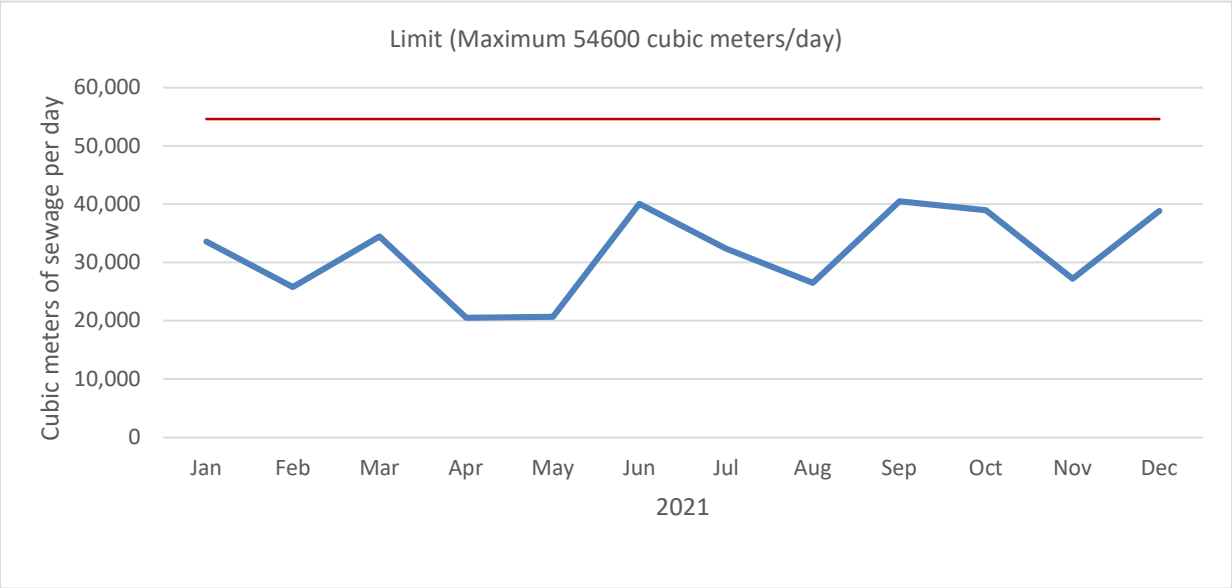
1.2 Table 2 – Monthly Average Sewage Flow Summary

Monthly Average Sewage Flow Summary				
2021	**Total Flow** (m3)	**Average Flow** (m3)	**Min. Flow** (m3)	**Max. Flow** (m3) 54,600 m3/day
January	521,775	16,831	12,711	33,573
February	389,112	13,897	11,767	25,745
March	570,479	18,403	13,273	34,462
April	467,438	15,581	13,322	20,511
May	416,313	13,429	11,447	20,669
June	450,794	15,026	11,235	40,048
July	556,588	17,954	13,503	32,355
August	484,453	15,628	12,905	26,511
September	566,520	18,884	12,344	40,510
October	810,228	26,136	16,374	38,927
November	633,947	21,132	15,859	27,212
December	745,030	24,033	17,608	38,856
Totals	**6,612,677**	**18,078**	**11,235**	**40,510**

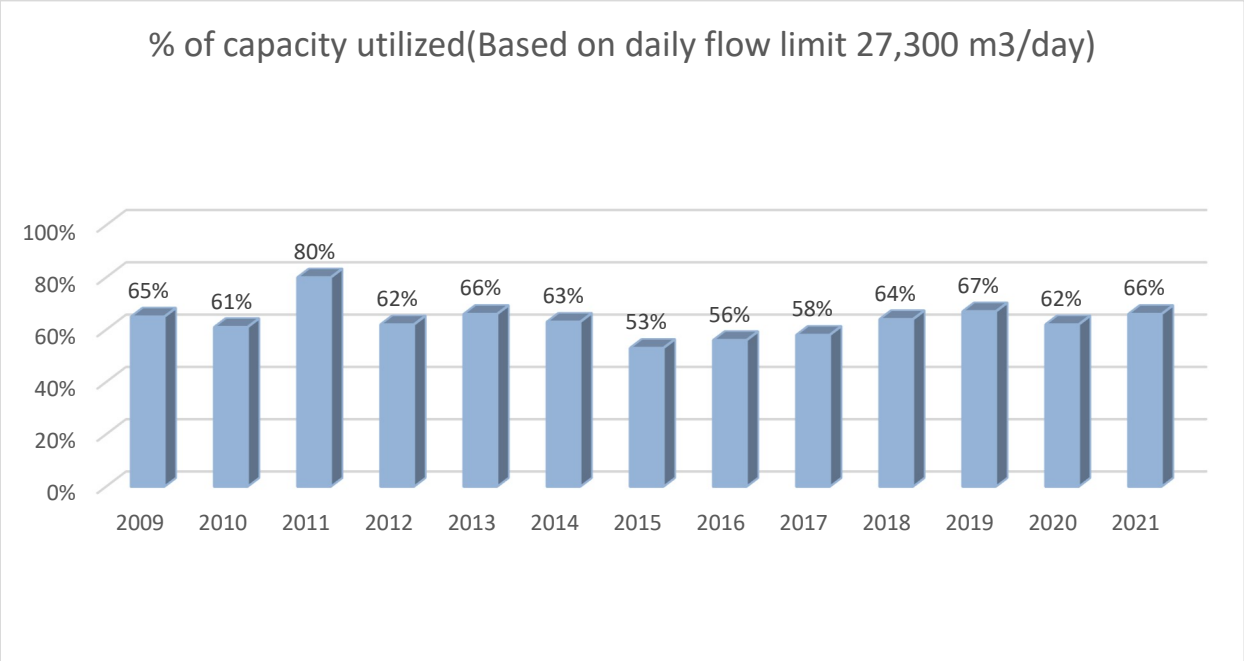
1.3 Chart 1 – Monthly Average Day Sewage Flow



1.4 Chart 2 – Monthly Maximum Day Sewage Flow



1.5 Chart 3 – Annual Average Day as a percent of WPCP Average Day Flow Capacity



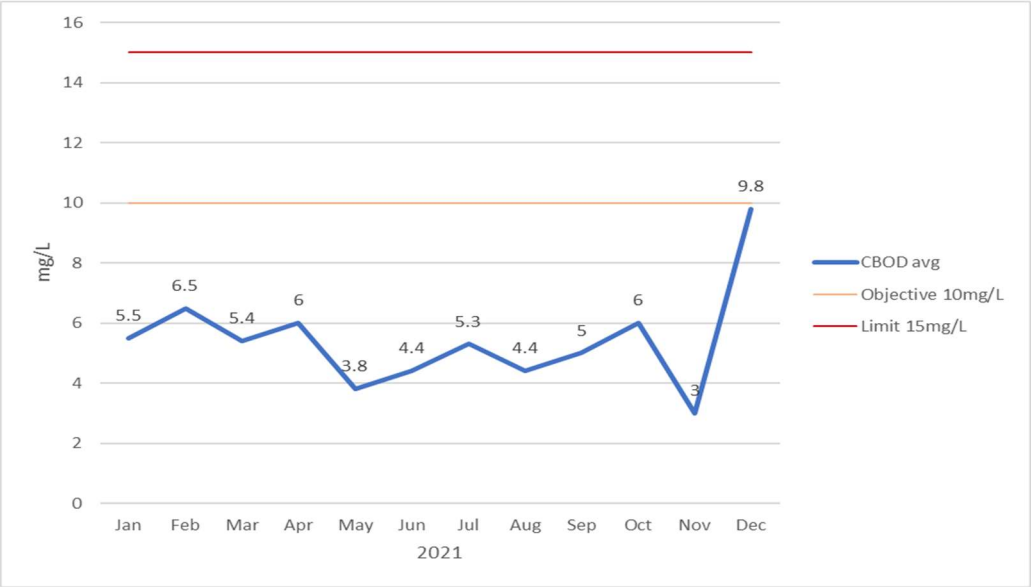
1.6 Weekly Laboratory Analytical Data and Un-ionized Ammonia

Raw Influent						Final Effluent													
Date	BOD5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Ammonia+ Ammonium as N (mg/L)	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Ammonia+ Ammonium as N (mg/L)	NO2 (mg/L)	NO3 (mg/L)	NO2 + NO3 (mg/L)	E.Coli (cfu/ 100mL)	pH @ Temp 15°C (Cert)	pH (In-House)	Temp (°C)	UV% Power	Unionized Ammonia (ug/L)
05-Jan-21	118	114	1.87	19.7	15.2	10	12	0.55	4.2	3.2	1	9.43	10.4	1120	7.60	7.53	12.8	76	24.8357
12-Jan-21	251	228	2.54	30.1	22.6	8	19	0.63	5.3	1.5	1.69	16.1	17.8	32	7.60	7.60	12.7	60	13.5556
19-Jan-21	144	68	2.73	28.5	24.1	2	1	0.56	3.5	1.8	1.43	16.9	18.3	28	7.47	7.48	12.9	62	12.5568
28-Jan-21	181	285	3.02	35.4	28.5	2	6	0.62	1.9	0.7	0.71	25.3	26	6	7.41	7.80	12	60	9.4563
Average	173.5	173.75	2.54	28.425	22.6	5.5	9.5	0.59	3.73	1.80	1.21	16.93	18.13	50					15.1011
02-Feb-21	223	245	4.21	36.6	29.3	2	6	0.69	4.1	2.2	0.91	21.4	22.3	26	7.83	8.00	11.2	60	43.9793
09-Feb-21	267	667	4.24	36.3	30	10	7	0.72	4.3	3.2	0.91	19.4	20.3	48	7.44	7.20	9.8	64	9.2468
16-Feb-21	210	1550	3.72	36.4	30.6	7	6	0.69	6.6	6.4	1.12	17.8	18.9	120	7.50	7.99	10.4	60	117.6607
23-Feb-21	250	269	3.67	32.8	27.7	7	6	0.76	7.9	7.8	1.05	16	17.1	600	7.62	7.28	11.6	60	31.1485
Average	237.5	682.75	3.96	35.525	29.4	6.5	6.3	0.72	5.7	4.9	1.00	18.65	19.65	97					50.5088
02-Mar-21	143	142	1.77	18.2	13.9	7	10	0.35	3.7	2.5	0.33	11	11.3	292	7.26	7.66	9.9	80	20.8834
09-Mar-21	212	229	2.8	25.3	22.4	6	7	0.3	1	1.4	0.45	19.1	19.6	4	7.78	6.80	11.8	60	1.8852
16-Mar-21	223	188	3.05	27	22.8	4	4	0.31	1.9	1.1	0.52	19.6	20.1	18	7.40	6.44	11.5	60	0.6322
23-Mar-21	224	74	3.26	31.7	25.7	5	5	0.49	1.6	1	0.71	19	19.7	1	7.58	7.36	12.6	200	5.1805
30-Mar-21	125	109	1.98	20.6	16.9	5	6	0.33	1.8	0.4	0.27	15.8	16.1	4	7.35	7.43	12.2	72	2.3590
Average	185.4	148.4	2.572	24.56	20.34	5.4	6.4	0.36	2.0	1.28	0.46	16.9	17.36	10					6.1881
06-Apr-21	170	284	2.86	27.4	23.8	6	3	0.42	1.8	0.8	0.53	21.1	21.6	52	7.61	7.70	12.7	64	9.0804
13-Apr-21	186	181	2.47	24	17.5	10	9	0.62	2.2	0.4	0.3	18.5	18.8	50	7.48	7.60	13.5	72	3.8414
20-Apr-21	179	168	2.79	27.2	21.7	6	8	0.52	1.1	0.4	0.44	22	22.4	8	7.60	7.58	12.8	68	3.4800
27-Apr-21	153	188	2.74	38.7	28.3	2	1	0.45	1.4	0.05	0.32	23.5	23.8	14	7.48	6.51	14.3	60	0.0419
Average	172	205.25	2.715	29.325	22.825	6.0	5.3	0.50	1.6	0.41	0.40	21.28	21.65	23					4.1109
04-May-21	106	131	2.74	28.6	23.7	5	4	0.57	1.9	1.4	1.04	18.2	19.2	30	7.60	8.30	14.4	64	69.2658
11-May-21	147	72	2.95	34.4	31.4	2	3	0.45	3	1.2	1.12	220.9	22	16	7.50	7.89	14.4	60	23.8178
18-May-21	326	210	3.41	39.1	31.5	6	5	0.6	0.25	0.4	0.82	24.2	25	4	7.42	8.13	15.7	60	14.9509
25-May-21	200	241	4.58	43.9	39.9	2	8	0.71	0.9	0.6	1.02	24.6	25.6	30	7.31	7.88	16.8	60	13.8988
Average	194.8	163.5	3.42	36.5	31.625	3.8	5.0	0.58	1.5	0.90	1.00	71.98	22.95	15					30.4833
01-Jun-21	146	143	4.24	28.7	29.7	2	2	0.36	0.25	0.05	0.7	22.7	23.4	30	7.43	7.71	17.1	60	0.8066
08-Jun-21	190	212	3.6	32.4	28.5	10	6	0.59	0.25	0.05	0.66	23.5	24	64	7.35	7.59	17.7	60	0.6419
15-Jun-21	282	375	3.02	29.9	27.4	2	5	0.54	1	0.1	0.73	23.3	24	28	7.44	7.40	17.9	60	0.8451
22-Jun-21	247	247	2.81	30.9	24.7	4	8	0.47	1	0.4	0.4	19.2	19.6	24	7.51	7.68	17.7	60	6.2994
29-Jun-21	61	54	1.43	22.3	18.4	4	5	0.23	0.25	0.05	0.22	15.2	15.4	80	7.68	7.67	19.5	60	0.8773
Average	185.2	206.2	3.02	28.84	25.74	4.4	5.2	0.44	0.55	0.13	0.54	20.78	21.32	40					1.8941
06-Jul-21	214	157	2.39	26	21.8	6	3	0.28	0.25	0.3	0.45	17.2	17.7	46	7.81	7.79	20.6	60	7.4640
13-Jul-21	77	54	1.44	28.6	22	5	6	0.46	0.9	1	0.49	16.3	16.8	40	7.20	7.52	19.7	64	12.6677
20-Jul-21	206	195	2.66	23.3	19.1	2	7	0.38	0.25	0.05	0.19	16	16.2	54	7.68	7.50	19.5	60	0.5965
27-Jul-21	250	230	2.55	27	22.2	8	7	0.4	0.9	0.5	0.69	14.9	15.6	14	7.57	7.64	20.1	60	8.5589
Average	186.8	159.0	2.26	26.23	21.28	5.3	5.8	0.38	0.58	0.46	0.46	16.10	16.58	34					7.3218
03-Aug-21	146	190	2.34	25.6	20.5	4	9	0.57	1.8	0.5	0.28	15.3	15.6	12	7.55	6.90	19.5	60	1.5119
10-Aug-21	235	63	2.22	26.2	24.2	2	6	0.49	0.8	0.05	0.32	21.3	21.6		7.30	7.91	20.9	72	1.6617
16-Aug-21														122				61	
17-Aug-21	158	341	1.51	24	21.9	4	3	0.41	0.25	0.2	0.38	17.8	18.2	600	7.43	7.73	21.1	60	4.5052
24-Aug-21	141	344	1.67	19.1	13.6	8	6	0.31	1	0.2	0.29	12.6	12.9	234	7.68	7.73	20.7	64	4.3789
31-Aug-21	80	195	2.58	21.6	21.5	4	7	0.34	0.25	0.3	0.28	19.1	19.4	94	7.47	7.69	21.3	60	6.2638
Average	152	226.6	2.064	23.3	20.34	4.4	6.2	0.42	0.82	0.25	0.31	17.22	17.54	114					3.6643
07-Sep-21	167	265	2.56	26.5	23.3	5	11	0.48	1.4	0.8	0.6	19.7	20.3	18	7.24	7.31	21.8	68	7.3064
14-Sep-21	132	256	1.74	18.7	16.7	7	12	0.42	0.25	0.5	0.31	12.4	12.7	1240	7.26	7.48	21.1	60	6.3968
21-Sep-21	247	253	3.12	32.2	28.8	6	11	0.67	2.2	0.5	0.31	21.4	21.7	84	7.23	7.67	20.4	76	9.3589
28-Sep-21	432	429	3.97	23.8	15.6	2	7	0.3	0.8	0.1	0.14	13.6	13.7	13	7.80	7.67	20.6	68	1.8987
Average	244.5	300.75	2.8475	25.3	21.1	5.0	10.3	0.47	1.16	0.48	0.34	16.78	17.10	70					6.2402
05-Oct-21	168	276	1.84	15.2	14.3	5	10	0.37	0.6	0.1	0.09	11.4	11.5	114	7.51	7.66	19.6	80	1.7277
12-Oct-21	124	192	1.63	15.4	13.8	5	4	0.37	0.9	0.5	0.25	10.4	10.7	78	7.64	7.00	20	74	1.9725
19-Oct-21	122	96	1.51	14.1	11.7	7	6	0.24	0.25	0.05	0.27	12.3	12.6	380	7.77	7.36	18.2	64	0.3943
26-Oct-21	50	41	1.15	11.4	9.7	7	6	0.37	0.9	0.2	0.14	10	10.1	200	7.68	7.33	18.7	136	1.5275
Average	116	151.25	1.5325	14.025	12.375	6.0	6.5	0.34	0.66	0.21	0.19	11.03	11.23	161.233					1.4055
02-Nov-21	62	35	1.39	14.7	13.9	5	2	0.52	0.6	0.05	0.03	12.7	12.7	30	7.87	7.89	16.9	80	1.1932
09-Nov-21	136	121	2.5	23.6	20	4	4	0.65	1.4	0.2	0.06	17	17.1	20	7.35	7.30	18	64	1.3548
16-Nov-21	71	84	0.96	13.8	12	2	2	0.4	0.25	0.05	0.015	12.4	12.4	1000	7.87	7.73	15.6	84	0.7555
23-Nov-21	163	145	2.15	22.6	18.9	2	6	0.36	1.2	0.05	0.08	15.2	15.3	28	7.81	7.90	15.4	64	1.0932
30-Nov-21	134	378	1.65	16	14.8	2	8	0.36	0.25	0.05	0.19	14	14.2	30	7.79	7.74	14.7	80	0.7227
Average	113.2	152.6	1.73	18.14	15.92	3.0	4.4	0.46	0.74	0.08	0.08	14.26	14.34	55					1.0239
07-Dec-21	104	101	1.17	12.7	8.8	6	8	0.35	1	0.2	0.24	9.86	10.1	118	7.68	7.92	14.1	96	4.1536
14-Dec-21	75	54	1.31	12.7	11.9	16	9	0.32	0.5	0.1	0.18	13.1	13.3	46	7.69	7.71	13.4	84	1.2245
21-Dec-21	177	222	2.51	21	16.3	6	10	0.39	0.7	0.1	1.01	16.2	17.2	20	7.82	7.69	14.8	60	1.3000
29-Dec-21	197	200	2.35	22.3	18.3	11	6	0.44	2.3	0.3	1.69	15.4	17.1	16	7.40	7.35	13.7	64	1.6519
Average	138.3	144.25	1.835	17.175	13.825	9.8	8.3	0.38	1.13	0.18	0.78	13.64	14.43	36					2.0825

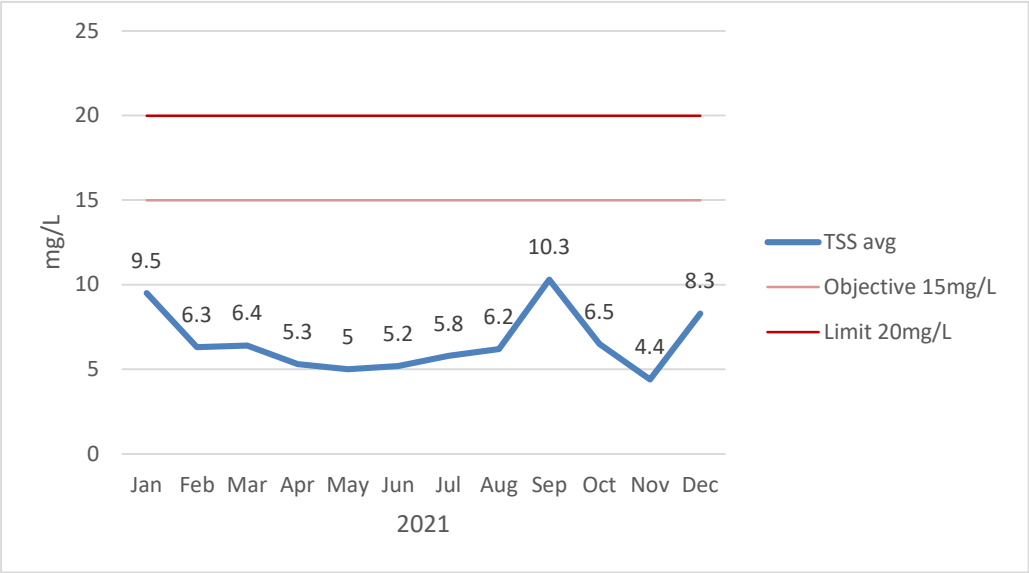
1.7 Table 4 – Monthly Average Influent/Effluent Concentrations and Loadings

Month 2021	# of Days	Total Flow (m3)	Average Daily Flow (m3)		CBOD (BOD on Influent)		TSS (20 mg/L, 546 kg/d)		Total Amm (5 mg/L)	TKN		TP (1 mg/L)		E.coli (200 CFU/ 100 mL)	pH min/ max (6.0-9.5 on Effluent)	
					Influent	*Effluent*	*Influent*	*Effluent*	*Effluent*	*Influent*	*Effluent*	*Influent*	*Effluent*	*Effluent*	*(min)*	*(max)*
January	31	521,775	16,831	(mg/L)	174	5.5	174	9.5	1.80	28.43	3.73	2.5	0.59	50	7.48	7.8
				(kg/day)	2920	93	2924	160	30.3			43	9.9			
February	28	389,112	13,897	(mg/L)	238	6.5	683	6.25	4.90	35.53	5.73	4.0	0.72	97	7.2	8
				(kg/day)	3301	90	9488	87	68.1			55	9.9			
March	31	570,479	18,403	(mg/L)	185	5.4	148	6.4	1.28	24.56	2	2.6	0.36	10	6	7.66
				(kg/day)	3412	99	2731	118	23.6			47	6.6			
April	30	467,438	15,581	(mg/L)	172	6.0	205	5.25	0.41	29.33	1.63	2.7	0.50	23	6.51	7.7
				(kg/day)	2680	93	3198	82	6.4			42	7.8			
May	31	416,313	13,429	(mg/L)	195	3.8	164	5	0.90	36.50	1.51	3.4	0.58	15	7.88	8.3
				(kg/day)	2615	50	2196	67	12.1			46	7.8			
June	30	450,794	15,026	(mg/L)	185	4.4	206	5.2	0.13	28.84	0.55	3.0	0.44	40	7.4	7.71
				(kg/day)	2783	66	3098	78	2.0			45	6.6			
July	31	556,588	17,954	(mg/L)	187	5.3	159	5.75	0.46	26.23	0.58	2.3	0.38	34	7.5	7.79
				(kg/day)	3353	94	2855	103	8.3			41	6.8			
August	31	484,453	15,628	(mg/L)	152	4.4	226.6	6.2	0.25	23.30	0.82	2.1	0.42	114	6.9	7.91
				(kg/day)	2375	69	3541	97	3.9			32	6.6			
September	30	566,520	18,884	(mg/L)	245	5.0	301	10.25	0.48	25.30	1.16	2.8	0.47	70	7.31	7.67
				(kg/day)	4617	94	5679	194	9.0			54	8.8			
October	31	810,228	26,136	(mg/L)	116	6.0	151	6.5	0.21	14.03	0.66	1.5	0.34	161	7	7.66
				(kg/day)	3032	157	3953	170	5.6			40	8.8			
November	30	633,947	21,132	(mg/L)	113	3.0	153	4.4	0.08	18.14	0.74	1.7	0.46	55	7.3	7.9
				(kg/day)	2392	63	3225	93	1.7			37	9.7			
December	31	745,030	24,033	(mg/L)	138	9.8	144	8.25	0.18	17.175	1.13	1.8	0.38	36	7.35	7.92
				(kg/day)	3323	234	3467	198	4.2			44	9.0			
Totals	**365**	**6,612,677**	**18,078**	(mg/L)	**175**	**5.41**	**226**	**6.58**	**0.92**	**25.61**	**1.69**	**2.54**	**0.47**			
				(kg/day)	**3066.9**	**100.35**	**3863**	**120.5**	**14.5871**							

1.8 Chart 4 – Monthly Average Effluent CBOD (mg/L)

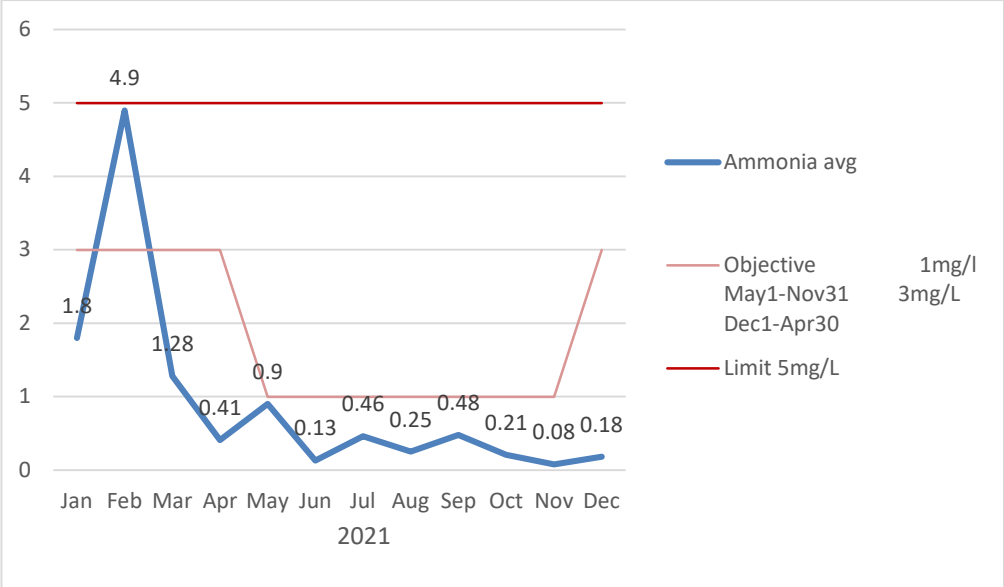


1.9 Chart 5 – Monthly Average Effluent Total Suspended Solids (mg/L)

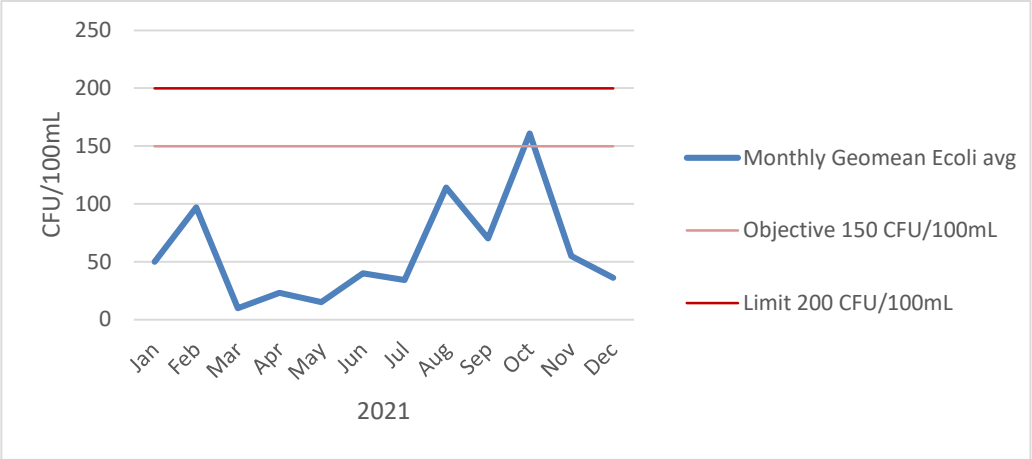


1.10 Chart 6 –Monthly Average Effluent Total Phosphorus (mg/L)

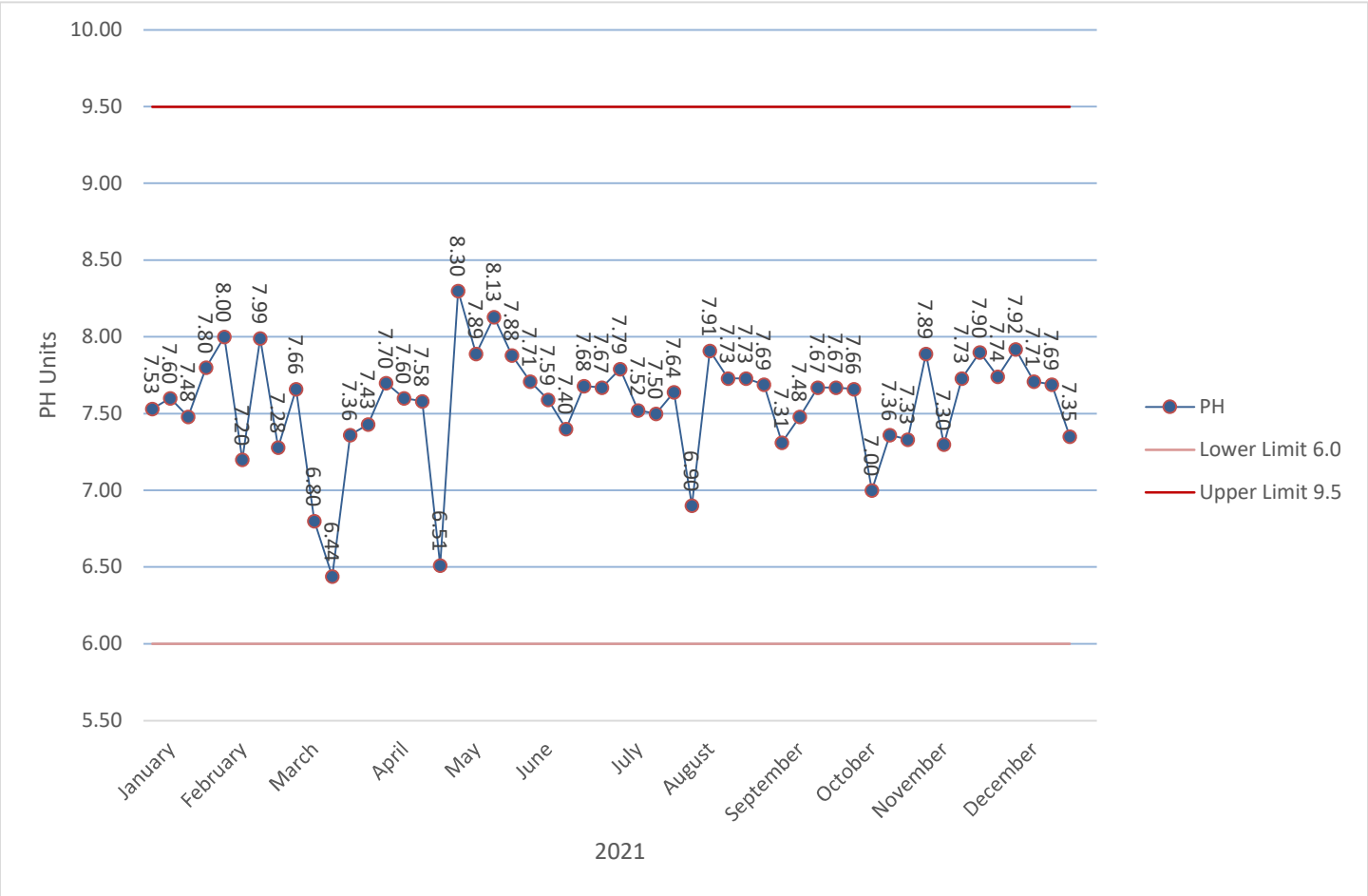
1.11 Chart 7 –Monthly Average Effluent Ammonia + Ammonium (mg/L)



1.12 Chart 8 – Monthly Geomean Effluent E. Coli. (CFU/100 mL)



1.13 Chart 9 – Weekly Effluent pH



2 Data Interpretation:

The following represents a comprehensive interpretation of all monitoring and certified analytical data obtained during the 2021 reporting period, comparing plant effluent quality and quantity to the criteria stipulated in the ECA.

Peak Flow:

The peak day flow measured through the plant was 40,510 m^3/day in September 2021. This represents 74% of the ECA peak day rating of 54,600 m^3/day.

Average Daily Flow:

The average daily flow for the year measured through the plant in 2021 was 18,078 m^3/day. This represents 66% of the ECA average day rating of 27,300 m^3/day for any period greater than one (1) calendar year. A three-year average daily flow for 2019–18,400 m3/day ,2020-17,013 m3/day and 2021-18,078 is 17,673 m^3/day or 65% of plant capacity.

Overflow, Bypass and Spills:

11 miscellaneous spills occurred in 2021 as detailed in Table 5- Summary of Effluent Quality Control and Environmental Operating Issues. There were no other diversions of sewage from any portion of the Water Pollution Control Plant. Diversions of sewage of this nature are prohibited.

Wet weather overflow events from the Combined Sewer Overflow Facility (ECA#3-1839-98-996) and Sewage Pumping Stations are detailed in Table 6- Summary of Overflows, Bypasses and Spills.

Carbonaceous Biochemical Oxygen Demand (5 day):

The highest monthly average $CBOD_5$ in effluent was 9.8 mg/L in December of 2021 with an annual average of 5.4 mg/L. Effluent $CBOD_5$ loadings were highest in December of 2021 at 234 kg/d and averaged 100 kg/d over the reporting period. As per the ECA, the monthly average limit of 15 mg/L with monthly average loading limits of 410 kg/d were not exceeded at any time in 2021.

Total Suspended Solids:

The highest monthly average Total Suspended Solids in effluent was 10.3 mg/L in September of 2021 with an annual average of 6.6 mg/L. Effluent TSS Loadings were highest in January of 2021 at 198 kg/d and averaged 120 kg/d over the reporting period. As per the ECA, the monthly average limit of 20 mg/L with monthly average loading limits of 546 kg/d were not exceeded at any time in 2021.

Total Phosphorus:

The highest monthly average Total Phosphorus in effluent was 0.72 mg/L in February of 2021 with an annual average of 0.47 mg/L. Effluent Total Phosphorus Loadings were highest in January of 2021 at 10 kg/d and averaged 8 kg/d over the reporting period. As per the ECA, the monthly average limit of 1 mg/L with monthly average loading limits of 27 kg/d were not exceeded at any time in 2021.

(Ammonia + Ammonium) Nitrogen:

The highest monthly average (Ammonia + Ammonium) Nitrogen in effluent was 4.90 mg/L in February of 2021 with an annual average of 0.92 mg/L. Effluent (Ammonia + Ammonium) Nitrogen Loadings were highest in February of 2021 at 68.1 kg/d and averaged 120 kg/d over the reporting period. As per the ECA, the monthly average limit of 5 mg/L with monthly average loading limits of 137 kg/d were not exceeded at any time in 2021.

Effluent pH:

The effluent pH ranged from 6.44 to 7.88 throughout 2021. As per the ECA, the range limit of 6.0 to 9.5 was maintained throughout the reporting period.

Disinfection:

The highest monthly geomean E. coli was 161 CFU/100 ml in October of 2021. As per the ECA, the monthly geomean limit of 200 CFU/100 ml was not exceeded at any time during the reporting period.

Complaints:

In 2021 there were a total of 5 odour complaints received from 4 different residents. Odour surveys were conducted at the Water Pollution Control Plant and surrounding areas throughout the year, most of which concluded no to minimum odours coming from the WPCP. Strong winds planned or emergency maintenance and cleaning of the Plant may create stronger than normal odours. Most odours that were detected during these surveys came from different sources, including: Solids Treatment Process, Agricultural and Local Landfills. The City has completed several studies and is in the process of adding additional odour control systems to the plant.

3 Operational Summaries:

The following tables, Table 5 through 9, represent a summary of effluent quality assurance/control measures, major maintenance conducted at the plant, measures taken to mitigate environmental and operational problems, future plant alterations and upgrades and monitoring equipment calibration/maintenance procedures:

3.1 Table 5 – Summary of Effluent Quality Control and Environmental Operating Issues

WPCP St. Thomas Spill Events

WPCP St.Thomas Spill Events					
Date	Location	Type of Event	Reference #	Description/ Details	Response/ Corrective Action
04-Jan-21	WPCP	Spill	7632-BWYMQZ	Blower faulted causing loss of aeration in Pl4, resulting in partial loss of treatment	Operator restored aeration to Pl4
23-Mar-21	WPCP	Spill	1306-BZDNGE	SCADA controls failed during tank maintenance, Partically treated sewage overflowed into catchbasin on property. Volume and time are estimated	Plant 3S Primary tank was empty due to maintenance, tried to divert all influent wate to fill tank, did not work. Manually closed CSO Gate, diverted flow to equalize influent into each plant. Hurricane cleaned up catchbasin
19-May-21	Confederation P.S	Spill	1-G9PF8	Pumps air locked and unable to pump down wet well	Operator primed pumps and grabbed samples
26-Jun-21	St. George P.S	Spill	1-NHSSK	Mechanical failure on pump #1. Pump lost prime when started. Was not able to stop pump on SCADA	Operator responded to Station and manually stopped pump #1, pump #2 started. All OK
08-Jul-21	WPCP	Spill	1-SG7QC	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK
19-Aug-21	WPCP	Spill	1-13VE0B	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK
22-Aug-21	WPCP	Spill	1-13ZBNK	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK
03-Sep-21	WPCP	Spill	1-189K7N	Alarm cleared on HMI and lead bank accidently shut off, causing banks to be off for 20 seconds	UV banks came back on after 20 seconds but 3 minutes to return to regulated dosing. No Representative sample collected
08-Sep-21	Confederation P.S	Spill	1-1818X4	Pumps air locked and unable to pump down wet well	Samples taken
15-Oct-21	WPCP	Spill	1-1BXWI2	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK
11-Dec-21	WPCP	Spill	1-1H72HA	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK

3.2 Table 6 – Summary of Overflows, Bypasses and Environmental Releases

Date	Location	Type of Event	Reference #	Description/ Details	Response/ Corrective Action	Start of Event		End of Event		Duration	Volume (m3)	Reason:	TP (mg/L)	TSS (mg/L)	pH	TKN (mg/L)	BOD (mg/L)	CBOD (mg/L)	E. Coli (cfu/ 100 mL)	Toxicity (%)	Rain (mm)
						Date	Time	Date	Time												
04-Jan-21	WPCP	Spill	7632-BWYMQZ	Blower faulted causing loss of aeration in PI4, resulting in partial loss of treatment	Operator restored aeration to PI4	4-Jan-21	16:05	5-Jan-21	8:45	16 hr, 40 min	7197.1	Mechanical	0.55	12	7.60	4.2		10	1,120		
23-Mar-21	WPCP	Spill	1306-BZDNGE	SCADA controls failed during tank maintenance, Partically treated sewage overflowed into catchbasin on property. Volume and time are estimated	Plant 3S Primary tank was empty due to maintenance, tried to divert all influent wate to fill tank, did not work. Manually closed CSO Gate, diverted flow to equalize influent into each plant. Hurricane cleaned up catchbasin	23-Mar-21	11:45	23-Mar-21	12:15	30 min	20	Mechanical									
26-Mar-21	CSO Facility	Overflow	210326-000006	Heavy rain throughout the night	Samples taken	26-Mar-21	5:14	26-Mar-21	9:19	3 hrs, 53 min	2652	Weather	1.53	114			42		1 600 000	Sample was lost	25
19-May-21	Confederation P.S	Spill	1-G9PF8	Pumps air locked and unable to pump down wet well	Operator primed pumps and grabbed samples	19-May-21	10:20	19-May-21	11:32	1 hr, 12 min	275.31	Mechanical	5.89	181	7.37	54.3	420		192 000 000		
26-Jun-21	Woodworth P.S	Overflow	210626-000006	Heavy Rain for long period	Samples taken	26-Jun-21	3:50	26-Jun-21	8:23	4 hr, 33 min	2668.4	Weather	1.35	268	7.66	6.53	41.4		190,000		80
26-Jun-21	CSO Facility	Overflow	210626-000005	Heavy Rain for long period	Samples taken	26-Jun-21	4:03	26-Jun-21	15:58	11 hr, 36 min	32992	Weather	0.489	9.5		5.13	5.8		610,000	0%	80
26-Jun-21	St. George P.S	Overflow	210626-000007	Heavy Rain for long period	Samples taken	26-Jun-21	4:17	26-Jun-21	7:09	2 hr, 52 min	2.8	Weather	0.707	95	7.70	3.91	11.1		300,000		80
26-Jun-21	St. George P.S	Spill	1-NHSSK	Mechanical failure on pump #1. Pump lost prime when started. Was not able to stop pump on SCADA	Operator responded to Station and manually stopped pump #1, pump #2 started. All OK	26-Jun-21	9:07	26-Jun-21	9:22	15 min	1.25	Mechanical	1.74	72	7.73	16	27.9		1,700,000		
29-Jun-21	Woodworth P.S	Overflow	210629-000010	Heavy Rain	Samples taken	29-Jun-21	17:40	29-Jun-21	18:00	20 min	134.61	Weather	2.44	142	7.49	15.8	98		5,600,000		20
08-Jul-21	WPCP	Spill	1-SG7QC	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK	08-Jul-21	7:01	08-Jul-21	7:04	3 min	48.2	Power									
17-Jul-21	CSO Facility	Overflow	1-YEZXL	Rain	Samples taken	17-Jul-21	11:37	17-Jul-21	13:36	1 hr, 47 min	869.7	Weather	2.52	114			60.8		6,500,000	0% DM, 10% RT	26
29-Jul-21	St. George P.S	Overflow	210729-000005	Heavy Rain	Samples taken	29-Jul-21	8:39	29-Jul-21	10:19	1 hr, 40 min	9.87	Weather	4	698	6.85	20	154		3,500,000		30
29-Jul-21	Confederation P.S	Overflow	210729-000006	Heavy Rain	Samples taken	29-Jul-21	8:47	29-Jul-21	9:09	22 min	67.5	Weather	0.883	66.8	7.23	5.4	19.5		2,100,000		30
29-Jul-21	Woodworth P.S	Overflow	210729-000007	Heavy Rain	Samples taken	29-Jul-21	8:43	29-Jul-21	11:46	3 hr, 3 min	1843	Weather	4.75	397	6.91	18	158		7,600,000		30
29-Jul-21	Wolfe P.S	Overflow	210729-000008	Heavy Rain	Samples taken	29-Jul-21	8:45	29-Jul-21	9:10	25 min	165.75	Weather	0.722	76	7.23	4.1	15.1		600,000		30
29-Jul-21	Sunset P.S	Overflow	210729-000009	Heavy Rain	Samples taken	29-Jul-21	8:37	29-Jul-21	8:47	10 min	16.1	Weather	0.687	73.2	7.26	2.7	15.7		140,000		30
29-Jul-21	CSO Facility	Overflow	210729-000010	Heavy Rain	Samples taken	29-Jul-21	9:28	29-Jul-21	18:11	7 hr, 5 min	11136	Weather	1.47	80			40.4		2,500,000	0%	30
19-Aug-21	WPCP	Spill	1-13VE0B	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK	19-Aug-21	20:15	19-Aug-21	20:18	3 min	36	Power									
22-Aug-21	Woodworth P.S	Overflow	210822-000001	Heavy Rain	Samples taken	22-Aug-21	16:16	22-Aug-21	17:56	1 hr, 40 min	909.9	Weather	3.1	251	7.36	15	142		3,700,000		27
22-Aug-21	Wolfe P.S	Overflow	210822-000001	Heavy Rain	Samples taken	22-Aug-21	16:22	22-Aug-21	16:56	34 min	225.42	Weather	0.588	56.7	7.45	4.3	41.1		690,000		27
22-Aug-21	St. George P.S	Overflow	210822-000001	Heavy Rain	Samples taken	22-Aug-21	16:48	22-Aug-21	17:03	15 min	0.22	Weather	2.4	116	7.18	17.4	117		5,600,000		27
22-Aug-21	CSO Facility	Overflow	210822-000001	Heavy Rain	Sampler Failed, no sample taken	22-Aug-21	17:03	22-Aug-21	20:02	2 hr, 20 min	5238	Weather									27
22-Aug-21	WPCP	Spill	1-13ZBNK	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK	22-Aug-21	8:21	22-Aug-21	8:24	3 min	31.2	Power									
03-Sep-21	WPCP	Spill	1-189K7N	Alarm cleared on HMI and lead bank accidently shut off, causing banks to be off for 20 seconds	UV banks came back on after 20 seconds but 3 minutes to return to regulated dosing. No Representative sample collected	03-Sep-21	14:50	03-Sep-21	14:53	3 min	4.8	Operational									
08-Sep-21	Confederation P.S	Spill	1-1818X4	Pumps air locked and unable to pump down wet well	Samples taken	08-Sep-21	11:34	08-Sep-21	11:47	15 min	89.25	Mechanical	6.19	132	7.46	52	159		11,600,000		

13-Sep-21	CSO Facility	Overflow	210913-000011	Heavy Rain	CSO Alarm did not alarm Oncall Operator and Sampler did not sample	13-Sep-21	1:38	13-Sep-21	1:54	17 min	117	Weather									34
22-Sep-21	CSO Facility	Overflow	210922-000002	Heavy Rain	Samples taken	22-Sep-21	2:28	24-Sep-21	0:13	45 hr, 15 min	90795	Weather	1	33.6			22.5		390,000	0%	93
22-Sep-21	Woodworth P.S	Overflow	210922-000003	Heavy Rain	Samples taken	22-Sep-21	0:18	23-Sep-21	2:10	12 hr, 33 min	5093.7	Weather	1.13	78.7	8.03	2.5	30.7		380,000		87
22-Sep-21	St. George P.S	Overflow	210922-000013	Heavy Rain	Samples taken	22-Sep-21	18:18	22-Sep-21	22:00	3 hr, 42 min	460.49	Weather	0.92	92.8	7.40	8.6	33.8		440,000		87
22-Sep-21	Wolfe P.S	Overflow	210922-000015	Heavy Rain	Samples taken	22-Sep-21	18:15	22-Sep-21	21:06	2 hr, 51 min	1133.7	Weather	0.328	27.6	7.59	3.84	12.7		91,000		87
03-Oct-21	Woodworth P.S	Overflow	211003-000002	Heavy Rain	Samples taken	03-Oct-21	10:38	03-Oct-21	13:14	2 hr, 36 min	1259.1	Weather	1.88	489	7.44	10	81.1		5,100,000		33
03-Oct-21	St. George P.S	Overflow	211003-000002	Heavy Rain	Samples taken	03-Oct-21	11:02	03-Oct-21	11:45	43 min	0.7	Weather	2.8	127	7.32	20	108		8,100,000		33
03-Oct-21	CSO Facility	Overflow	211003-000002	Heavy Rain	Samples taken	03-Oct-21	11:37	03-Oct-21	21:44	9 hr, 29 min	7809	Weather	0.962	15.9			5		460	23.3% DM, 0% RT	33
08-Oct-21	CSO Facility	Overflow	211003-000000	Heavy Rain	Samples taken	8-Oct-21	6:21	8-Oct-21	12:11	4 hr, 43 min	2602	Weather	1.06	80			55.3		1,060,000	0%	16
15-Oct-21	WPCP	Spill	1-1BXWI2	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK	15-Oct-21	17:07	15-Oct-21	17:10	0 Hr, 3 min	66.4	Power									
15-Oct-21	Woodworth P.S	Overflow	211015-000014	Heavy Rain	Samples taken	15-Oct-21	17:46	15-Oct-21	21:56	4 hr, 10 min	1787.3	Weather	1.39	156	7.08	15	65.6		590,000		39
15-Oct-21	St. George P.S	Overflow	211015-000014	Heavy Rain	Samples taken	15-Oct-21	17:58	15-Oct-21	19:34	1 hr, 36 min	1.55	Weather	1.56	117	7.17	11.3	58.1		4,700,000		39
15-Oct-21	CSO Facility	Overflow	211015-000014	Heavy Rain	Samples taken	15-Oct-21	18:20	16-Oct-21	20:29	24 hr, 51 min	28933	Weather	1.08	104			28.2		620,000	0%	39
25-Oct-21	CSO Facility	Overflow	211025-00009	Heavy Rain	Samples Taken	25-Oct-21	19:32	25-Oct-21	23:13	3 hr, 33 min	1496	Weather	1.08	31.80			39.70		3,200,000	0%	11
29-Oct-21	CSO Facility	Overflow	211029-000007	Heavy Rain	Samples taken	29-Oct-21	17:36	30-Oct-21	10:53	17 hr, 17 min	10036	Weather	0.92	24.20			20.60		790,000	0%	25
05-Dec-21	Woodworth P.S	Overflow	211205-000008	Heavy Rain	Samples taken	5-Dec-21	21:40	5-Dec-21	23:27	1 hr, 32 min	6.1	Weather	1.2	105	7.34	10.2	47.3				25
05-Dec-21	CSO Facility	Overflow	211205-000009	Heavy Rain	Samples taken	5-Dec-21	21:56	6-Dec-21	15:33	16 hr, 2 min	14795	Weather	1.40	57.80			53.00		No Data: Overgrown	0%	25
11-Dec-21	CSO Facility	Overflow	211211-000003	Heavy Rain	Samples taken	11-Dec-21	5:08	11-Dec-21	22:34	15 hr, 55 min	22185	Weather	0.83	70.00			12.20		440,000	0%	31
11-Dec-21	Woodworth P.S	Overflow	211211-000003	Heavy Rain	Samples taken	11-Dec-21	4:38	11-Dec-21	7:18	2 hr, 40 min	723.4	Weather	0.751	213	7.25	6.01	142				31
11-Dec-21	WPCP	Spill	1-1H72HA	Power Blip caused UV to power down. <3min	Checked UV/ equipment after power blip, All OK	11-Dec-21	14:01	11-Dec-21	14:04	3 min	90	Power									

2021 Environmental Releases

Date	Location	Start of Event		End of Event		Description of Contaminants	Released to	MECP/SAC Reference #	Details of Occurrence	Actions Taken	Samples Collected
		Date	Time	Date	Time						
13-Sep-21	WPCP	13-Sep-21	2:03 PM	06-Oct-21	3:30 PM	Food grade hydraulic oil	Kettle Creek	1-19oKBA	Suspected hydraulic fluid leaking from UV bank modules	Called in Trojan Technologies to inspect UV System. Found Bank 1B leaking oil, fixed the leak and now issue is resolved and banks back in normal conditions	Yes

3.3 Table 7 – Summary of Major Maintenance Items/ Project

2021 Completed Major Maintenance
Effluent Pump#3 replaced
Sludge Pump#1 new motor/drive upgrade
Pump#5 panel & drive moved to Gallery#2 from blower building
4x 12" automatic butterfly valves replaced in Gallery#1
Safety ladder installed to blower building roof
Acid cleaning complete on all 6 aeration domes
New Grit tank aeration manifold and spargers installed
Potable water line installed to service Lystek building as backup source

3.4 Table 8 – Summary of Future Upgrade Planning

Future Major Maintenance Upgrades
Multiple scum trough replacements throughout all plants
Plant#3 final clarifier drive shaft, sprockets, and gates to be upgraded
New sludge pump to be installed in Gallery#1
Automated actuators and valves for plants #2 and #3 to control sludge return/wasting
Repair/replace flushing water line out of Gallery#1 to Gallery#2
New gate at Grit tank
Blower building heating project on-going

3.5 Table 9 - Summary of Monitoring Equipment Calibrations

SCG FLOWMETRIX

Instrument Verification
Certificate of Completion

CLIENT CITY OF ST. THOMAS

LOCATION ST. THOMAS WWPCP

Summary - Equipment List											
#	LOCATION	DESCRIPTION	MANUFACTURER	MODEL	SERIAL NUMBER	FIT #	TECH	CSE	VERIFICATION INFO.		
									DATE	FREQ.	DUE
EQUIPMENT LIST - PASS											
1	St. Thomas WWPCP	Raw Sludge Flow Meter	Krohne	IFC 100W	10634441	DG-Q16	TK	-	18-Oct-21	Annual	Oct-22
2	St. Thomas WWPCP	Effluent Flow Plants 2&3S	Milltronics	OCMIII	041102102PB	FIT-211	TK	-	18-Oct-21	Annual	Oct-22
3	St. Thomas WWPCP	Effluent Flow Plants 4&3N	Milltronics	OCMIII	041102103PB	FIT-212	TK	-	18-Oct-21	Annual	Oct-22
4	St. Thomas WWPCP	Plant #2 Flow Meter	Endress+Hauser	Prosonic 91W	C4061B02000	N/A	TK	-	18-Oct-21	Annual	Oct-22
5	St. Thomas WWPCP	Plant #3 Flow Meter	Endress+Hauser	Prosonic 91W	C4061C02000	N/A	TK	-	18-Oct-21	Annual	Oct-22
6	St. Thomas WWPCP	Plant #4 Flow Meter	Endress+Hauser	Prosonic 93W	C407CE02000	N/A	TK	-	18-Oct-21	Annual	Oct-22
7	St. Thomas WWPCP	Raw Primary Sludge Flow Meter	Krohne	IFC 100W	A19317875	DG-Q7	TK	-	18-Oct-21	Annual	Oct-22
8	St. Thomas WWPCP	Plant #4 East Flow DP Meter	Vega	VEGADIF 85	43627448	FIT-1-3	TK	-	18-Oct-21	Annual	Oct-22
9	St. Thomas WWPCP	Plant #4 West Flow DP Meter	Vega	VEGADIF 85	43627447	FIT-1-4	TK	-	18-Oct-21	Annual	Oct-22
10	St. Thomas WWPCP	Plant #3 Flow DP Meter	Vega	VEGADIF 85	43627445	FIT-1-1	TK	-	18-Oct-21	Annual	Oct-22
11	St. Thomas WWPCP	Plant #2 Flow DP Meter	Vega	VEGADIF 85	43627446	FIT-1-2	TK	-	18-Oct-21	Annual	Oct-22
12	St. Thomas WWPCP	Centrate Wet Well Flow	Rosemount	8750	14886682	N/A	TK	-	18-Oct-21	Annual	Oct-22
13	St. Thomas WWPCP Gallery #2	RAS/WAS Flow #2	Greyline	DFM-IV Doppler	17729	N/A	TK	-	18-Oct-21	Annual	Oct-22
14	St. Thomas WWPCP Gallery #2	RAS/WAS Flow #1	Greyline	DFM-IV Doppler	17730	N/A	TK	-	18-Oct-21	Annual	Oct-22
15	St. Thomas WWPCP - CSO Site	CSO - Overflow Meter	Vega	VEGAMET 625	40053229	N/A	TK	-	18-Oct-21	Annual	Oct-22
16	St. Thomas WWPCP	Reactor Discharge	Endress+Hauser	Promag 400	M80BB116000	N/A	TK	-	18-Oct-21	Annual	Oct-22
17	St. Thomas WWPCP	Potable Water	Endress+Hauser	Promag 400	MA097516000	N/A	TK	-	18-Oct-21	Annual	Oct-22
18	St. Thomas WWPCP	FIT-60-204	Endress+Hauser	Promag 400	M80B2C16000	N/A	TK	-	18-Oct-21	Annual	Oct-22
19	St. Thomas WWPCP	Utility Water	Endress+Hauser	Promag 400	M80BB216000	N/A	TK	-	18-Oct-21	Annual	Oct-22
20	St. Thomas WWPCP	KOH	Truflo	NA	NA	N/A	TK	-	18-Oct-21	Annual	Oct-22
21	St. Thomas WWPCP	Ferric Acid	Truflo	NA	NA	N/A	TK	-	18-Oct-21	Annual	Oct-22
22	St. Thomas WWPCP	Dry Sludge	Siemens	Mag 5000	N1J5020133	N/A	TK	-	18-Oct-21	Annual	Oct-22

3.6 Deviations to sampling schedule

Original Date	Sample Date	Reason For Sample Date Change
01.26.2021	**01.28.2021**	Raw sample line was not in water, no sample taken. Scheduled maintenance on 01.26.2021. Samples rescheduled for 01.28.2021.
08.10.2021	**08.16.2021**	E. coli holding time was over limit on 08.10.2021 due to delivery issues. Resampled E. coli 08.16.2021.
12.28.2021	**12.29.2021**	12.28.2021 was a statutory holiday. Samples rescheduled 12.29.2021

3.7 Table 10 - 2021 Sampling schedule

2022 Monitoring Program for Sampling					
Week #	Day of Week	Date	Type	Raw Parameters Tested	Final Parameters Tested
1	Wednesday	5-Jan-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
2	Wednesday	12-Jan-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
3	Wednesday	19-Jan-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
4	Wednesday	26-Jan-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
5	Wednesday	2-Feb-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
6	Wednesday	9-Feb-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
7	Wednesday	16-Feb-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
8	Wednesday	23-Feb-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
9	Wednesday	2-Mar-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
10	Wednesday	9-Mar-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
11	Wednesday	16-Mar-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
12	Wednesday	23-Mar-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
13	Wednesday	30-Mar-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
14	Wednesday	6-Apr-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
15	Wednesday	13-Apr-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
16	Wednesday	20-Apr-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
17	Wednesday	27-Apr-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
18	Wednesday	4-May-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
19	Wednesday	11-May-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
20	Wednesday	18-May-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
21	Wednesday	25-May-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
22	Wednesday	1-Jun-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
23	Wednesday	8-Jun-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
24	Wednesday	15-Jun-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
25	Wednesday	22-Jun-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
26	Wednesday	29-Jun-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
27	Wednesday	6-Jul-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
28	Wednesday	13-Jul-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
29	Wednesday	20-Jul-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
30	Wednesday	27-Jul-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
31	Wednesday	3-Aug-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
32	Wednesday	10-Aug-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
33	Wednesday	17-Aug-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
34	Wednesday	24-Aug-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
35	Wednesday	31-Aug-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
36	Wednesday	7-Sep-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
37	Wednesday	14-Sep-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
38	Wednesday	21-Sep-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
39	Wednesday	28-Sep-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
40	Wednesday	5-Oct-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
41	Wednesday	12-Oct-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
42	Wednesday	19-Oct-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
43	Wednesday	26-Oct-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
44	Wednesday	2-Nov-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
45	Wednesday	9-Nov-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
46	Wednesday	16-Nov-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
47	Wednesday	23-Nov-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
48	Wednesday	30-Nov-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
49	Wednesday	7-Dec-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
50	Wednesday	14-Dec-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
51	Wednesday	21-Dec-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH
52	Wednesday	28-Dec-22	Weekly	BOD5, TSS, TP, TKN, TAN	TP, CBOD, TAN, TSS, TKN, Nitrates, E.Coli, pH

4 Sludge Management:

4.1 Sludge Production:

This activated sludge plant, transfers sludge to a raw sludge storage tank. The tank is 40' diameter; 25' deep (including the 5' cone bottom) with a capacity of 712 cubic meters. Raw sludge is processed through a belt press achieving approximately 3% solids using a polymer. It is projected that sludge volumes in 2021 will be comparable to 2020.

4.2 Sludge Disposal:

A new solids treatment process called Lystek has been in production since April 2018, reducing organics to landfill. This process produces a Canadian certified fertilizer material which is land applied in order to contribute to a sustainable nutrient cycle.

In 2021 there was no sludge transported from the WPCP, all sludge was treated through the Lystek process and land applied. In 2020, a yearly total of 9,331 m3 of raw sludge was processed into a Canadian Food Inspection Agency (CFIA) approved fertilizer and hauled offsite to be land applied.

5 Overflow/By-pass Prevention:

5.1 2021 Summary:

In 2021, $591,768.00 was put towards multiple projects working towards elimination of bypass and overflow events. Projects include separation of combined sewers $250,000.00, along with a subsidy program to cover costs of disconnecting downspouts and installing sump pumping systems. In 2021, subsidy was provided for 27 residential basements back water valve installations, and 19 foundation drain disconnects and sump pump installations, the total amount subsidized equaled a total of $91,768.00. $400,000.00 was allocated towards a pollution prevention control plan which is now complete.

5.2 2022 Projections:

In 2022, the total projection towards overflow/bypass improvements is $3,815,000.00, with an estimated amount of $500,000.00 being spent on sewer separations. The basement flooding grant program has been budgeted to allow for subsidization of foundation drain disconnects and back water valve installations in 2022, to the order of $65,000.00. $250,000.00 has been allocated towards a wastewater management master plan class EA (WWMP) for the city. $3,000,000.00 has also been granted through the investing in Canada infrastructure program (ICIP) to optimize plant flows during wet-weather and reduce overflows.