EPCOR Water Services Inc.

Edmonton, Alberta

2021

Annual Wastewater System Report

Submitted to:

The Province of Alberta

Alberta Environment and Parks (AEP)

As per requirements of:

Approval to Operate No. 639-03-06

February 2022

Executive Summary

The following report contains two parts, Part I: Wastewater Treatment Plant and Part II: Wastewater Collection System, in order to meet the requirements of Approval to Operate No. 639-03-06.

The 2021 Annual Wastewater Treatment Plant Report is separated into an Annual Wastewater Treatment Report, an Annual Air Pollution Control System Report, an Annual Ambient Air Report, and a summary of contraventions reported, as outlined in the Approval to Operate.

The 2021 Annual Wastewater Collection System Report includes a summary of completed projects and planned major rehabilitation projects, the interconnection control strategy, and storm and CSO volumes and loadings in addition to other requirements outlined in the Approval to Operate.

Part I: Wastewater Treatment Plant Report

EPCOR Water Services Inc.

Gold Bar Wastewater Treatment Plant

Edmonton, Alberta

2021

Annual Wastewater Treatment Plant Report

Submitted to:

The Province of Alberta

Alberta Environment and Parks (AEP)

As per requirements of:

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Acronyms

ACRWC	Alberta Capital Region Wastewater Commission
AEP	Alberta Environment and Parks
CBBRF	Clover Bar Biosolids Recycling Facility
CBOD	Carbonaceous Biological Oxygen Demand
CSO	Combined Sewer Overflow
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pumping Station
EPT	Enhanced Primary Treatment
FE	Final Effluent
FEC	Final Effluent Combined
GBWWTP	Gold Bar Wastewater Treatment Plant
H_2S	Hydrogen Sulfide
HSE	Health, Safety, and Environment
ISO	International Organization for Standardization
ML	Megalitres
MLD	Megalitres per Day
MLSS	Mixed Liquor Suspended Solids
NH_3-N	Ammonia-Nitrogen
NSR	North Saskatchewan River
ORP	Oxidation-Reduction Potential
PE	Primary Effluent
SOP	Standard Operating Procedure
TKN	Total Kjeldahl Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UV	Ultraviolet
WELP	Wastewater Effluent Limit Performance
WWT	Wastewater Treatment
WWTP	Wastewater Treatment Plant

2021 Overview

The Gold Bar Wastewater Treatment Plant (WWTP) located on the banks of the North Saskatchewan River in Edmonton, Alberta maintains the ISO 14001:2015 (Environmental Management System) and the ISO 45001:2018 (Occupational Health and Safety Management System) certificates for its Integrated Management System.

Notable events in 2021 include cleaning of Digester 5, Digester 3 run in and dye testing, Secondary 3 structual rehab, beginning of Ambient Air Quality Monitoring Station construction, and ongoing upgrades to the Diversion Structure.

The true dry weather flow in 2021 was 254 MLD. 2021 hosted a smaller number of significant wet weather events (6) compared to previous years (21) which resulted in an reduced number of secondary bypasses (43). The plant performed very well with a WWTP Effluent Limit Performance (WELP) index of 18.2%.

2021 Annual Wastewater Treatment Report

Gold Bar WWTP Performance

The Gold Bar WWTP final effluent discharge limits of Approval to Operate 639-03-06 are listed in Table 1 and the monitoring requirements are outlined in Table 2.

Table 1: Limits for Treated Wastewater (Approval to Operate Table 5-1)

Parameter	Limit
$CBOD_5$	≤ 20 mg/L monthly arithmetic mean of daily composite samples
TSS	≤ 20 mg/L monthly arithmetic mean of daily composite samples
Total Phosphorus	≤ 1.0 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (December 1 to May 31)	≤ 10 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (June 1 to November 30)	≤ 5 mg/L monthly arithmetic mean of daily composite samples
E. Coli	≤ 126 per 100 mL/monthly geometric mean
pH	6.5-8.5

Table 2: Monitoring - Wastewater System (Approval to Operate Table 6-1)

Parameter	Frequency (Minimum)	Sample Type	Sampling Location
UNTREATED WASTEWATER			
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Untreated wastewater entering the wastewater treatment plant
Volume of Flow	Continuous, recorded daily	Calculated	Untreated wastewater entering the wastewater treatment plant
TREATED WASTEWATER			
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Wastewater treated plant effluent prior to release to the North Saskatchewan River
E. Coli	Once per day	Grab	After ultraviolet (UV) disinfection
Acute Toxicity	Monthly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Chronic Toxicity	Quarterly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Reuse water transmission main

WASTEWATER TREATMENT PLANT BYPASS			
Release Volume	Continuous during bypass event, recorded daily	Calculated	Primary and secondary treatment bypass of wastewater at the wastewater treatment plant
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Any bypass event lasting > 2 hours	Composite	
E. Coli	Any bypass event lasting > 2 hours	Grab	
SLUDGE DISPOSAL			
Sludge Volume	Total volume	Estimated	Prior to leaving the wastewater treatment plant
Sludge Mass	Total mass	Estimated	Amount of sludge being disposed of as per the *Biosolids Management Plan*
CSO OUTFALLS AND UNAUTHORIZED RELEASE			
Release Volume	Total volume during each discharge event	Continuous during discharge event	Rat Creek CSO outfall; Hardisty-Capilano CSO outfall; Highlands CSO outfall; Cromdale CSO outfall; Strathearn CSO outfall; and unauthorized release point
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen *E. Coli*	Each discharge event	Composite	Rat Creek CSO outfall
		Grab	Unauthorized release point
The amount of any substance other than wastewater or storm water that is spilled or discharged accidentally or intentionally into the wastewater collection system	Each event	Estimated volume or mass	Unauthorized release point

Table 3 summarizes the monthly minimum, mean, and maximum values for parameters in Table 1 from January 1 to December 21, 2021. All analytical data in the table were developed on 24-hour composite samples collected using autosamplers at the sampling location specified in Table 2. The discrete samples for *Escherichia coli* (*E. coli*) determinations were collected at random times each day. There was a varience to the 24 hour untreated wastewater composite samples for August 4 and 5, 2021 as noted in the August 2021 monthly Plant Performance Report, but all sampling requirements were still met. Appendix A contains the monthly Plant Performance Reports.

Table 3: 2021 Gold Bar WWTP Performance

Month		Flows (ML)							pH				TSS (mg/L)						BOD$_5$ (mg/L)				CBOD$_5$ (mg/L)			TP (mg P/L)						NH$_3$ (mg N/L)						TKN (mg N/L)				NO$_2$+NO$_3$ (mg N/L)				Chloride (mg/L)				E.coli Counts/100 mL				Total Digested Sludge (ML)
		Raw	Outfall 30	MPW	Outfall 20	EPEP S	Outfall 10		Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	EPEP S	Outfall 10		Raw	Outfall 30	Outfall 20	EPEP S	Outfall 10			Raw	Outfall 30	Outfall 20	EPEP S	Outfall 10		Raw	Outfall 30	Outfall 20	EPEP S	Outfall 10		Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	Outfall 10	
							FEC	FE				FEC					FEC	FE					FEC	FE						FEC	FE						FEC	FE				FEC											
January	Avg	238.8	0.0	11.2	0.0	0.0	227.6	227.6	7.5	---	---	7.6	314	---	---	---	3.0	3.0	307	---	---	---	2	2	7.49	---	---	---	0.20	0.20	39.1	---	---	---	0.98	0.98	57.4	---	---	2.36	0.03	---	---	9.36	96	---	---	103	---	---	---	---	
	Min	225.7	0.0	9.3	0.0	0.0	214.7	214.7	7.4	---	---	7.5	240	---	---	---	2.1	2.1	188	---	---	---	< 2	2	6.25	---	---	---	0.16	0.16	23.8	---	---	---	0.22	0.22	49.7	---	---	1.40	< 0.02	---	---	7.00	72	---	---	78.3	1.5	---	---	< 1	65.59
	Max	247.4	0.0	13.2	0.0	0.0	236.6	236.6	7.8	---	---	7.9	396	---	---	---	4.6	4.6	409	---	---	---	6	6	8.92	---	---	---	0.25	0.25	45.7	---	---	---	1.86	1.86	63.6	---	---	3.40	0.05	---	---	11.6	174	---	---	166	2.3	---	---	6	
February	Avg	248.1	0.8	11.3	0.0	0.0	236.0	236.0	7.5	7.4	---	7.6	323	299	---	---	5.0	5.0	320	180	---	---	3	3	7.07	5.26	---	---	0.30	0.30	34.7	17.7	---	---	2.62	2.62	57.2	45.3	---	4.71	0.07	0.19	---	5.68	117	509	---	114	---	---	---	---	
	Min	236.5	0.0	9.9	0.0	0.0	223.9	223.9	7.4	7.4	---	7.5	264	162	---	---	2.6	2.6	262	180	---	---	< 2	2	6.08	5.26	---	---	0.19	0.19	23.2	3.0	---	---	0.93	0.93	45.3	45.3	---	2.40	0.01	0.19	---	3.84	74	509	---	78.8	1.2	1.59	---	< 1	62.50
	Max	295.8	21.2	12.6	0.0	0.0	264.7	264.7	7.7	7.4	---	7.9	464	436	---	---	27.2	27.2	442	180	---	---	13	13	8.3	5.26	---	---	1.18	1.18	39.9	32.5	---	---	5.11	5.11	66.9	45.3	---	7.80	0.11	0.19	---	8.54	354	509	---	276	2.0	1.59	---	690	
March	Avg	263.7	7.1	11.2	0.0	0.0	245.4	246.4	7.5	7.5	---	7.5	335	80	---	---	5.0	5.0	312	148	---	---	3	3	6.89	4.06	---	---	0.27	0.27	30.9	32.6	---	---	3.98	3.98	54.0	40.7	---	5.79	0.09	0.37	---	7.64	118	194	---	131	---	---	---	---	
	Min	242.9	0.0	10.0	0.0	0.0	231.8	231.8	7.3	7.4	---	7.4	268	51	---	---	1.9	1.9	244	120	---	---	< 2	2	5.81	2.33	---	---	0.15	0.15	7.9	26.0	---	---	2.32	2.32	45.4	29.4	---	4.10	0.03	0.02	---	3.30	69	136	---	86.1	1.1	0.7	---	1	67.72
	Max	320.2	60.7	12.2	0.0	0.0	260.8	260.8	7.7	7.9	---	7.7	505	101	---	---	24.4	24.4	368	180	---	---	7	7	8.62	5.47	---	---	0.90	0.90	37.3	41.6	---	---	6.29	6.29	67.6	51.5	---	10.0	0.31	2.12	---	11.4	394	298	---	366	2.2	25.1	---	20	
April	Avg	249.9	0.4	9.8	0.0	0.0	239.7	239.7	7.4	7.5	---	7.5	318	94	---	---	5.0	5.0	306	142	---	---	3	3	7.00	5.39	---	---	0.32	0.32	36.1	25.7	---	---	3.79	3.79	55.2	42.6	---	5.75	0.04	0.10	---	7.88	88	196	---	95.6	---	---	---	---	
	Min	237.5	0.0	6.4	0.0	0.0	227.2	227.2	7.3	7.5	---	7.4	240	94	---	---	2.5	2.5	217	142	---	---	< 2	2	6.22	5.39	---	---	0.21	0.21	26.6	25.7	---	---	1.65	1.65	47.3	42.6	---	3.40	< 0.01	0.10	---	5.14	73	196	---	83.1	1.3	1	---	3	66.21
	Max	303.0	12.2	12.2	0.0	0.0	279.5	279.5	7.7	7.5	---	7.7	496	94	---	---	12.3	12.3	379	142	---	---	7	7	8.61	5.39	---	---	0.85	0.85	69.8	25.7	---	---	6.20	6.20	64.4	42.6	---	9.40	0.06	0.10	---	11.3	162	196	---	142	1.6	1	---	95	
May	Avg	308.1	38.8	6.6	0.0	0.0	262.7	262.7	7.4	7.5	---	7.6	323	103	---	---	3.7	3.7	277	131	---	---	2	2	6.47	4.29	---	---	0.23	0.23	31.1	27.9	---	---	2.21	2.21	51.3	37.2	---	3.88	0.01	0.69	---	8.21	78	73	---	86.5	---	---	---	---	
	Min	239.3	0.0	5.6	0.0	0.0	232.7	232.7	7.3	7.3	---	7.2	204	22	---	---	2.2	2.2	169	46	---	---	< 2	2	2.04	1.59	---	---	0.13	0.13	13.6	15.4	---	---	0.21	0.21	20.8	21.2	---	1.10	< 0.01	0.15	---	3.92	43	46	---	52.6	1.1	0.4	---	2	70.08
	Max	771.2	453.1	7.7	0.0	0.0	323.1	323.1	7.6	7.6	---	7.7	572	251	---	---	10	10	495	275	---	---	3	3	8.38	7.29	---	---	0.42	0.42	39.9	42.8	---	---	5.6	5.6	64.0	54.8	---	7.50	0.02	1.56	---	13.0	90	102	---	103	2.2	1.8	---	32	
June	Avg	283.9	8.8	10.2	0.0	0.0	264.9	264.9	7.5	7.6	---	7.6	268	76	---	---	3.2	3.2	277	125	---	---	2	2	6.66	4.37	---	---	0.23	0.23	30.4	31.7	---	---	0.26	0.26	53.0	43.6	---	1.86	0.02	0.20	---	11.4	75	75	---	86.7	---	---	---	---	
	Min	261.1	0.0	5.4	0.0	0.0	248.5	248.5	7.3	7.4	---	7.5	236	39	---	---	2.0	2.0	226	76	---	---	< 2	2	4.53	2.47	---	---	0.18	0.18	11.6	20.6	---	---	0.07	0.07	36.7	27.0	---	1.40	< 0.01	0.02	---	6.89	57	43	---	62.2	1.4	1.5	---	3	67.60
	Max	473.9	189.1	13.2	0.0	0.0	299.8	299.8	7.8	7.7	---	7.7	440	111	---	---	6.1	6.1	341	177	---	---	3	3	8.74	6.74	---	---	0.27	0.27	38.2	44.2	---	---	1.21	1.21	72.0	67.8	---	3.10	0.03	0.41	---	14.0	85	101	---	97.2	1.9	14.7	---	120	
July	Avg	274.0	7.7	11.3	0.0	0.0	255.0	255.0	7.4	7.4	6.9	7.6	302	187	1,522	---	5.5	5.5	274	173	140	---	3	3	6.47	4.59	3.01	---	0.30	0.30	29.4	24.7	10.1	---	0.42	0.42	48.0	36.3	12.8	2.18	0.03	0.71	0.40	10.8	68	56	29	82.1	---	---	---	---	
	Min	251.0	0.0	10.5	0.0	0.0	240.1	240.1	7.3	7.2	6.9	7.4	240	79	303	---	3.0	3.0	185	86	102	---	< 2	2	0.60	2.86	2.51	---	0.22	0.22	18.4	21.7	9.94	---	0.06	0.06	4.4	26.6	< 1.0	1.60	< 0.01	0.37	0.37	5.95	44	50	28	64.1	1.9	1.0	< 0.7	2	64.20
	Max	480.1	171.6	12.3	0.0	0.0	296.9	296.9	7.6	7.7	7.0	7.7	568	383	2,740	---	11.0	11.0	395	282	178	---	4	4	8.54	7.61	3.50	---	0.51	0.51	33.6	29.9	10.2	---	1.24	1.24	66.7	53.1	21.6	3.40	0.06	1.25	0.43	13.2	80	61	29	90.6	2	4.2	1.0	32	
August	Avg	277.1	13.2	10.3	0.0	0.0	253.6	253.6	7.5	7.4	7.0	7.5	292	58	408	---	6.2	6.2	286	70	135	---	3	3	6.47	2.09	2.76	---	0.40	0.40	30.9	23.6	11.9	---	0.91	0.91	49.6	30.5	15.0	2.72	0.01	0.33	0.47	11.0	69	54	31	80.2	---	---	---	---	
	Min	244.9	0.0	2.6	0.0	0.0	234.1	234.1	7.3	7.3	7.0	7.4	236	22	408	---	3.5	3.5	185	58	135	---	2	2	3.96	0.65	2.76	---	0.24	0.24	17.0	22.5	11.9	---	0.15	0.15	28.0	28.0	15.0	1.70	< 0.01	0.29	0.47	7.38	44	49	31	59.7	2.0	0.0	1.0	5	67.37
	Max	555.2	202.9	11.4	0.3	0.0	341.8	341.8	7.6	7.7	7.0	7.8	564	125	408	---	13.9	13.9	428	97	135	---	5	5	7.29	3.94	2.76	---	0.89	0.89	60.1	24.1	11.9	---	3.89	3.89	60.9	34.1	15.0	6.60	0.01	0.35	0.47	13.9	80	61	31	91.2	2.8	1.1	1.0	68	
September	Avg	267.8	6.3	11.3	0.0	0.0	250.2	250.2	7.4	7.7	---	7.5	322	60	---	---	5.2	5.2	292	128	---	---	3	3	6.90	4.61	---	---	0.34	0.34	35.8	36.8	---	---	0.43	0.43	55.8	45.5	---	2.22	0.01	0.12	---	13.8	75	75	---	85.8	---	---	---	---	
	Min	245.6	0.0	10.8	0.0	0.0	234.5	234.5	7.3	7.5	---	7.2	160	34	---	---	3.9	3.9	219	78	---	---	< 2	2	6.06	2.60	---	---	0.26	0.26	27.1	27.8	---	---	0.12	0.12	47.0	34.7	---	1.60	< 0.01	0.04	---	9.21	55	57	---	67.6	2.6	0.5	---	1	71.43
	Max	351.9	80.6	13.0	0.0	0.0	283.6	283.6	7.5	7.8	---	7.6	616	74	---	---	7.4	7.4	386	173	---	---	4	4	8.2	7.04	---	---	0.52	0.52	43.3	43.6	---	---	1.10	1.10	65.0	55.8	---	2.80	0.01	0.22	---	18.4	139	96	---	95.9	4.5	2.2	---	330	
October	Avg	257.2	6.1	10.1	0.0	0.0	241.0	241.0	7.5	7.5	---	7.5	320	67	---	---	3.5	3.5	294	110	---	---	2	2	8.04	3.04	---	---	0.23	0.23	37.3	19.9	---	---	0.56	0.56	59.1	26.2	---	2.04	0.02	0.19	---	8.49	73	47	---	78.5	---	---	---	---	
	Min	241.2	0.0	4.1	0.0	0.0	229.2	229.2	7.3	7.2	---	7.2	148	54	---	---	1.7	1.7	209	106	---	---	< 2	2	4.76	2.96	---	---	0.14	0.14	15.7	17.3	---	---	0.08	0.08	36.2	23.6	---	1.30	< 0.01	0.08	---	4.14	42	41	---	51.7	2.2	0.1	---	< 1	71.17
	Max	480.0	185.9	12.9	0.0	0.0	184.1	184.1	7.8	7.7	---	8.0	524	80	---	---	7.7	7.7	419	114	---	---	3	3	11.5	3.11	---	---	0.40	0.40	50.3	22.4	---	---	2.84	2.84	76.9	28.8	---	4.60	0.03	0.30	---	15.7	91	52	---	99.5	2.7	1.0	---	13	
November	Avg	247.4	0.0	11.6	0.0	0.0	235.7	235.7	7.5	---	---	7.6	298	---	---	---	4.1	4.1	319	---	---	---	3	3	8.25	---	---	---	0.28	0.28	39.8	---	---	---	1.24	1.24	62.2	---	---	2.78	0.02	---	---	9.13	100	---	---	102	---	---	---	---	
	Min	237.2	0.0	10.7	0.0	0.0	226.0	226.0	7.4	---	---	7.5	252	---	---	---	3.0	3.0	250	---	---	---	2	2	6.59	---	---	---	0.14	0.14	31.7	---	---	---	0.30	0.30	50.7	---	---	0.80	< 0.01	---	---	6.54	65	---	---	69.7	1.7	---	---	1	69.27
	Max	259.6	0.0	12.9	0.0	0.0	248.3	248.3	7.6	---	---	7.7	404	---	---	---	5.4	5.4	383	---	---	---	4	4	10.4	---	---	---	0.35	0.35	50.4	---	---	---	2.68	2.68	75.2	---	---	4.2	0.04	---	---	12.5	191	---	---	160	6.3	---	---	35	
December	Avg	250.8	0.6	11.7	0.0	0.0	238.6	238.6	7.5	7.49	---	7.5	306	50	---	---	5.5	5.5	325	114.00	---	---	3	3	9.42	4.97	---	---	0.37	0.37	44.3	2.05	---	---	2.76	2.76	66.9	52.3	---	5.01	0.04	0.04	---	10.2	120	980	---	127	---	---	---	---	
	Min	231.9	0.0	10.2	0.0	0.0	219.8	219.8	7.4	7.49	---	7.2	184	50	---	---	3.3	3.3	262	114.00	---	---	3	3	8.50	4.97	---	---	0.27	0.27	31.4	2.05	---	---	0.72	0.72	59.0	52.3	---	2.90	< 0.01	0.04	---	8.09	78.4	980	---	85.2	0.7	0.15	---	< 1	69.29
	Max	287.0	17.2	12.5	0.0	0.0	257.7	257.7	7.6	7.49	---	7.7	432	50	---	---	14.0	14.0	389	114.00	---	---	5	5	11.60	4.97	---	---	0.78	0.78	52.1	2.05	---	---	4.75	4.75	77.7	52.3	---	7.50	0.07	0.04	---	13.0	534	980	---	360	2.0	0.15	---	7	
Annual Volume (ML)		96,374	3,364.00	3,848	0.70	0.00	89,763	89,762																																													812.4
2021	Avg	264	8.1	10.6	0.00	0.00	246	246	7.5	---	7.0	7.5	312	107	965	---	4.6	4.6	299	132	138	---	3	3	7.26	4.27	2.88	---	0.29	0.29	35.0	24.2	11.0	---	1.68	1.68	55.8	40.0	13.9	3.44	0.03	0.29	0.44	9.47	90	226	30	98					
2020	Avg	294	21.6	10.7	0.00	0.00	262	262	7.6	7.6	7.9	7.6	340	81	276	---	4.4	4.4	289	119	55	---	3	3	7.51	4.46	1.47	---	0.26	0.26	34.6	32.0	4.3	---	2.18	2.18	56.2	42.7	9.9	4.01	0.04	0.88	7.46	8.90	10	136	68	105					

PBP – Plant Bypass
TBP – Total Bypass Plant (including plant and secondary)
SEC – Secondary Bypass Plant
EPE - Enhanced Primary Effluent
EPT – Enhanced Primary Treatment

Outfall 10 - Combined, UV-disinfected (FEC + EPE)
Outfall 20 – Combined Bypass (RAW + PE + EPE)
Outfall 30 – Combined Bypass (RAW + Screened + PE + EPE)

FEC – Final Effluent, Combined
RAW – Influent
BOD_5 – 5-day Biological Oxygen Demand
CBOD$_5$ – 5-day Inhibited BOD

TSS – Total Suspended Solids
TP – Total Phosphorus
NH_3-N – Ammonia as nitrogen

MPW – Membrane Product Water
NS – No sample

Table 4 summarizes the reclaimed water quality sample data from January 1 to December 31, 2021. All parameters except *E. coli* were developed on daily 24-hour composite samples of the recycled water. The *E. coli* testing was conducted on discrete samples collected on a daily basis.

Table 4: 2021 Reclaimed Water Quality

Month		FLOW (ML)	Total Alkalinity (mg CaCO3/L)	Ammonia (mg N/L)	Biochemical Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)	Chloride (mg Cl/L)	Conductivity (µS/cm) @25°C	*E. coli* (CFU/100 mL)	pH @25°C	Total Suspended Solids (mg/L)	Total Organic Carbon (mg/L)	Total Phosphorus (mg P/L)	Total Dissolved Solids (mg/L)	Turbidity (NTU)
January	Avg	11.18	158	0.14	< 2	25	108	924	< 1	8.0	<1.0	8.0	0.08	557	0.20
	Min	9.30	152	0.06	< 2	20	85.4	817	< 1	7.9	<1.0	7.3	0.05	512	0.14
	Max	13.20	163	0.48	< 2	33	174	1,140	< 1	8.2	<1.0	8.6	0.10	671	0.33
February	Avg	11.29	169	0.85	< 2	28	119	987	< 1	8.0	<1.0	8.4	0.09	573	0.19
	Min	9.90	163	0.08	< 2	20	80.4	816	< 1	7.9	<1.0	7.8	0.07	504	0.15
	Max	12.60	174	4.25	< 2	49	286	1,650	< 1	8.2	<1.0	9.1	0.16	849	0.28
March	Avg	11.18	165	1.32	< 2	29	136	1,006	< 1	8.0	<1.0	8.5	0.07	602	0.19
	Min	10.00	155	0.32	< 2	20	90.6	875	< 1	7.9	<1.0	7.4	0.03	535	0.13
	Max	12.20	180	4.14	< 2	43	386	1,750	< 1	8.2	<1.0	9.6	0.10	974	0.30
April	Avg	9.76	151	0.67	< 2	28	99.5	898	< 1	8.0	<1.0	8.7	0.10	547	0.17
	Min	6.40	140	0.13	< 2	20	83.0	827	< 1	7.9	<1.0	8.2	0.06	500	0.12
	Max	12.20	169	4.12	< 2	43	153	1,050	< 1	8.2	<1.0	10.0	0.29	608	0.29
May	Avg	6.61	152	0.33	< 2	29	91.0	984	< 1	8.1	<1.0	8.8	0.11	620	0.17
	Min	5.60	120	0.06	< 2	20	57.9	612	< 1	7.9	<1.0	6.8	0.05	384	0.12
	Max	7.70	169	2.65	< 2	40	110.0	1,190	< 1	8.1	<1.0	10.3	0.47	767	0.30
June	Avg	10.21	158	0.10	< 2	27	92.4	1,016	< 1	8.0	<1.0	9.3	0.10	659	0.19
	Min	5.40	147	0.04	< 2	21	65.2	777	< 1	7.9	<1.0	8.2	0.03	475	0.11
	Max	13.20	165	0.68	< 2	42	104	1,110	< 1	8.2	<1.0	10.8	0.13	730	0.42
July	Avg	11.33	151	0.10	< 2	30	85.2	926	< 1	8.0	<1.0	8.9	0.10	591	0.24
	Min	10.50	140	0.04	< 2	20	76.4	808	< 1	8.0	<1.0	8.1	0.07	499	0.14
	Max	12.30	157	0.41	< 2	48	92.0	974	< 1	8.1	<1.0	10.2	0.14	656	0.43
August	Avg	10.31	136	0.19	< 2	30	84.2	853	< 1	7.9	<1.0	8.5	0.12	543	0.23
	Min	2.60	126	0.05	< 2	20	62.4	648	< 1	7.7	<1.0	7.7	0.07	408	0.12
	Max	11.40	147	1.81	< 2	62	98.6	903	< 1	8.0	<1.0	9.7	0.25	582	0.47
September	Avg	11.32	131	0.11	< 2	29	92.0	888	< 1	7.9	<1.0	9.1	0.13	550	0.28
	Min	10.80	128	0.05	< 2	20	72.5	757	< 1	7.8	<1.0	8.4	0.03	469	0.11
	Max	13.00	134	0.37	< 2	45	126	929	< 1	8.0	<1.0	10.1	0.30	579	0.55
October	Avg	10.10	156	0.10	< 2	25	156	845	< 1	7.9	<1.0	7.9	0.13	520	0.27
	Min	4.10	146	0.07	< 2	20	58.8	634	< 1	7.9	<1.0	6.8	0.06	380	0.18
	Max	12.90	172	0.57	< 2	36	95.5	905	< 1	8.1	<1.0	9.7	0.71	570	0.42
November	Avg	11.64	144	0.20	< 2	27	144	917	< 1	8.0	<1.0	8.0	0.11	558	0.31
	Min	10.70	137	0.06	< 2	20	74.2	819	< 1	7.9	<1.0	7.5	0.08	502	0.18
	Max	12.90	150	0.92	< 2	41	171	1,110	< 1	8.1	<1.0	8.8	0.16	657	0.69
December	Avg	11.66	144	0.93	< 2	28	129	984	< 1	7.9	<1.0	8.8	0.12	583	0.28
	Min	10.20	132	0.13	< 2	20	84.8	838	< 1	7.6	<1.0	8.0	0.07	501	0.13
	Max	12.50	156	4.96	< 3	44	385	1,750	< 1	8.0	2.9	10.8	0.29	985	1.32
Annual Summary	Avg	10.55	151	0.42	< 2	28	111	936	< 1	8.0	<1.0	8.6	0.10	575	0.23
	Min	2.60	120	0.04	< 2	20	57.9	612	< 1	7.6	<1.0	6.8	0.03	380	0.11
	Max	13.20	180	4.96	< 2	62	386	1750	< 1	8.2	2.9	10.8	0.71	985	1.32

Table 5 summarizes the effluent chronic and acute toxicity testing. Both acute and chronic toxicity tests were carried out by contract laboratories in accordance with the Environment Canada Biological Test Methods (Environment Canada 1990 and 1992). The acute testing included 48-hour Rainbow Trout static toxicity, 48-hour static toxicity using *Daphnia magna* and 15-minute Microtox tests using luminescence bacteria. Seven-day *Ceriodaphnia dubia*, *Fathead minnows* and three-day P. Subcapitata survival and reproductive impairment tests were used to determine chronic toxicity. No effluent toxic events were observed in 2021.

Table 5: 2021 Effluent Toxicity

Dates	Qrt	Microtox	*Daphnia Magna*	*Rainbow Trout*	*Ceriodaphia Dubia*	*Fathead Minnows*	*Pseudokirchneriella*				
					Survival	Survival					
		% of Control	LC_{50} %[1]	LC_{50} %	LC_{50} %	LC_{50} %[2]	IC_{25} %[3]	NOEL(%)[4]	LOEL(%)[5]	TOEL (%)[6]	Toxic Units(TU)[7]
1/13/2021	1	>82	>100	>100	>100	>100	>90.91	<1.42	1.42	ND	>70.42
2/10/2021		>82	>100	>100							
3/11/2021		>82	>100	>100							
4/14/2021	2	>82	>100	>100	>100	>100	>90.91	1.42	2.841	2.009	70.42
5/17/2021		>82	>100	>100							
6/10/2021		>82	>100	>100							
7/7/2021	3	>82	>100	>100	>100	>100	>90.91	22.728	45.455	32.14	4.4
8/9/2021		>82	>100	>100							
9/15/2021		>82	>100	>100							
10/6/2021	4	>82	>100	>100	>100	>100	>90.91	5.682	11.364	8.036	17.6
11/15/2021		>82	>100	>100							
12/9/2021		>82	>100	>100							

[1] LC50 - % effluent concentration at which there is a 50% mortality of test organisms; [2] IC50 - % effluent concentration at which there is a 50% reduction in growth or reproduction of test organisms; [3] IC25 - % effluent concentration at which there is a 25% reduction in growth or reproduction of test organisms; [4] NOEL - the concentration at which there was no observed effect level; [5] LOEL - the concentration at which you start seeing the lowest observable effect; [6] TOEL - NOEL/LOEL; [7] TU - the ratio of the concentration observed divided by the concentration for 50% inhibition.

Table 6 summarizes the proficiency testing of the Gold Bar WWTP Laboratory. It includes the Laboratory z-scores achieved from analyzing proficiency testing (PT) samples for constituents required by the Approval to Operate. The 2021 PT samples were provided by the Canadian Association for Laboratory Accreditation (CALA). A PT scores greater than or equal to 70 or z-scores less than or equal to 3.000 are considered acceptable for CALA PT.

Table 6: 2021 Summary of Gold Bar Wastewater Proficiency Testing

Study	Date	pH		BOD		C-BOD		TSS		NH3-N		TP		*E.coli*	
		PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score
PTC	Mar-21	99	0.05	85	0.08	94	0.43	96	0.25	97	0.23	90	0.04	90	0.66
PTC	Oct-21	97	0.15	95	0.34	91	-0.62	96	-0.08	98	-0.11	90	0.70	97	-0.03

Notes:

PT Score > 70 acceptable.

VH - Very high bias, H - High bias, L - Low bias, A - Acceptable, Q - Questionable, U - Unsatisfactory

CALA - Canadian Association for Laboratory Accreditation.

pH - pH manual, BOD - 5-day Biochemical Oxygen Demand, C-BOD - 5-day Carbonaceous Biochemical Oxygen Demand, TSS - Total Suspended Solids, NH3-N - Ammonia as Nitrogen, TP - Total Phosphorus.

E.coli - Sample analyzed using membrane filtration (mENDO) method.

In 2021, a total of 96,373 million litres (ML) of wastewater was conveyed to the plant. Secondary treatment and UV disinfection was provided to 89,763 ML (93.1%) of the total raw influent flow with 3,848 ML (4.0%) of reclaimed water provided to industrial customers.

Assessment of Annual Monitoring Results

The Gold Bar WWTP Effluent Limit Performance (WELP) index for 2021 was 18.24% (Figure 1). The 2021 index was lower than the five-year average of 22.3% due to having more process tanks/equipment available than in previous years, fewer wet weather flows than previous years, and good performance of Ostara Nurtient Recovery Facility for supernatant treatment. Figure 2 shows the annual WELP from 2005 to 2021, including the five-year average.

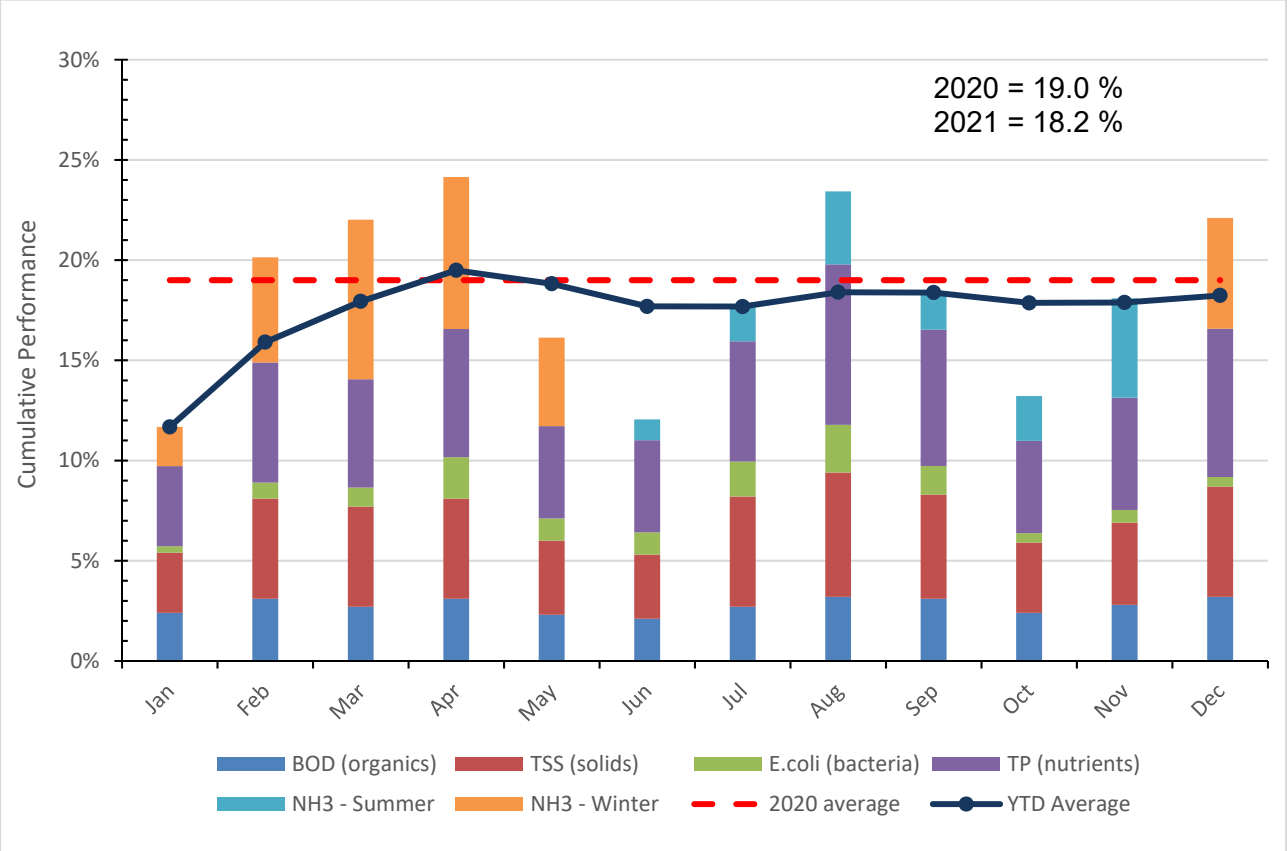

Figure 1: 2021 Monthly Gold Bar WWTP Wastewater Effluent Limit Performance (WELP) Index

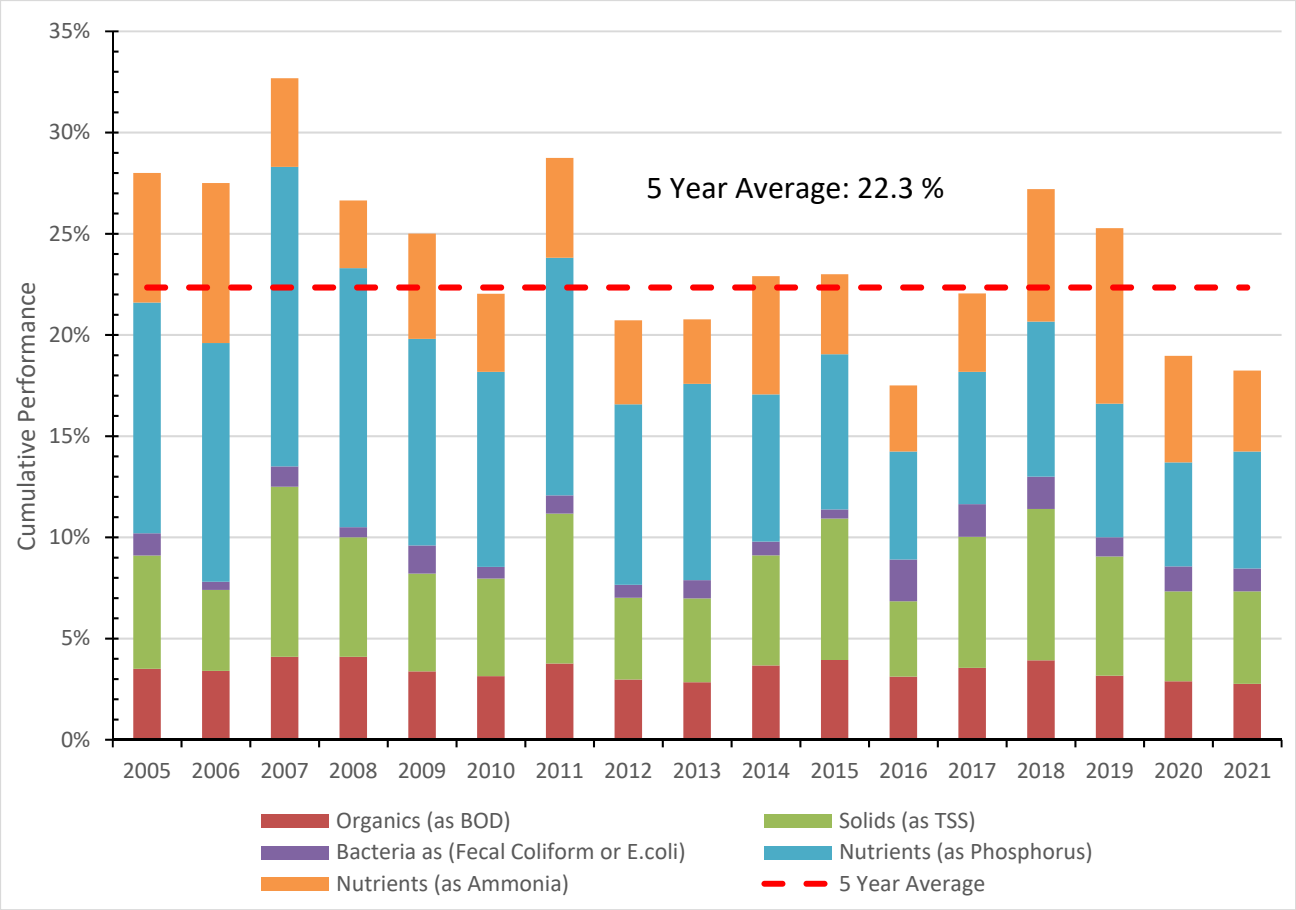

Figure 2: Gold Bar WWTP Wastewater Effluent Limit Performance (WELP Index) 2005-2021

For 2021, all of the monthly limits for Approval to Operate discharge parameters (Table 1) were met.

Chemicals Added to the Wastewater Treatment Process

As per Section 6 of the Operations Plan, the following chemicals are used in the wastewater treatment process:

- Secondary Alum
- EPT Alum
- EPT Polymer
- DAF Polymer
- Membrane Bleach
- Ostara Magnesium Chloride
- Ostara Caustic

Daily and monthly consumption of these chemicals is summarized in Appendix B.

Names of Supervising Operators

Table 7 lists all certified wastewater treatment operators, their level of certification, and their positions at Gold Bar WWTP as of December 2021. Supervising operators are also listed in the Operations Monthly Summaries in Appendix C.

Table 7: List of Certified Wastewater Treatment Operators (as of December 2021)

Name	Title	WWT Certification Level
Grossell, Ken M	Manager, Operations	IV
Schneider, Brian P	WWTP Operator Foreman	IV
Jones, Kira I	WWTP HEI Coordinator	IV
Kwan, Tom	WWTP Operator Foreman	IV
Espinosa, Diego F	WWTP Operator Foreman	IV
Lekamwasam, Janaka	WWTP Operator Foreman	IV
Nunes, Michael	WWTP Operator Foreman	IV
Penner, Jody	WWTP Lead Operator	IV
Sanche, Dagny	WWTP Training Coordinator	IV
Barrett, Jeremy L	Manager, Process Risk & Integration	III
Li, Bing (Frank)	WWTP Operator	III
Jama, Yusuf	WWTP Operator	III
Budden, Curt	WWTP Operator Foreman	III
Rindero, Billy	WWTP Operator Foreman	III
Hetherington, Clarke	WWTP Operator	III
Hahn, Kevin	WWTP Operator Foreman	III
Sandouga, Sam	WWTP Lead Operator	III
Baker, Cole	WWTP Operator Foreman	III
Holden, Derek	WWTP Operator	III
Jordan, Bradley	WWTP Lead Operator	III
Nieuwenhuis, Andrew	WWTP Lead Operator	III
Vogelgesang, Ryan	WWTP Operator	III
Kelly, Adam	WWTP Operator	III
Diletzoy, Kyle	WWTP Lead Operator	III
Rees, Emma	WWTP Operator	III
Downey, Anthony	WWTP Operator	II
Paglicauan, Jermine	WWTP Operator	II
Omeragic, Armen	WWTP Operator	II
Furber, Brandyn	WWTP Operator	I
Ozimko, Michael	WWTP Operator	I
Price, Jeremy	WWTP Operator	I
Cassell, Blake	WWTP Operator	I

Uncommitted Hydraulic Reserve Capacity

In 2021, Gold Bar WWTP received a total dry weather volume of 93,611 ML. This volume is the sum total of Outfall 10 effluent (89,763 ML) and membrane reclaimed water (3,848 ML). Outfall 10 effluent also includes wet weather flow that did not result in secondary bypass and any additional wet weather flow that had secondary treatment during secondary bypass events.

The average dry weather flow in 2021 was 256 million litres per day (MLD). However, the true dry weather flow was lower than 256 MLD and was approximately 254 MLD. The true dry weather average flow excludes additional flow to the plant during snow melt or rainfall, but includes inflow and infiltration (I&I). The total true dry weather volume was approximately 92,519 ML.

Based on 310 MLD of average secondary treatment capacity and a true dry weather average flow of 254 MLD, the uncommitted hydraulic reserve capacity for secondary treatment in 2021 was 56 MLD.

Wet Weather Summary

In 2021, Gold Bar WWTP had 43 days of secondary and primary plant bypasses. The total volume of secondary bypass was 2,714 ML. In addition, the total primary bypass volume was 51 ML.

There were 6 significant wet weather events with inflows to the plant greater than 1,200 MLD. The plant received a peak flow rate of approximately 1,877 MLD on July 21, 2021.

Summary of Operational Issues

Key operational activities, issues, and remedial actions are outlined in the Operations Monthly Summaries in Appendix C.

2021 Annual Air Pollution Control System Report

Table 8 and Table 9 describe the air pollution control system and ambient air monitoring limits and monitoring requirements. Note that for 2021 ambient air monitoring was completed using a portable low range H_2S analyzer and no assessment of results was included as per Section 6.3.3 (a) (iii) (B) of the Approval to Operate. The ambient air quality monitoring station is to be commissioned and in operation before June 30, 2022 as per December 13, 2021 letter from AEP.

Table 8: Air Pollution Control System Operating Limits (Approval to Operate Table 5-2)

Air Pollution Control System	Monitoring Location	Parameter	Limit
East scrubber; West scrubber; EPT scrubber; and Fermenter scrubber	Blowdown recirculation line before chemical makeup of each wet scrubber	pH	≥ 8.0
		ORP	≥ 300 mV
N/A	Ambient air monitoring station	H_2S, NO_2, and SO_2	After ambient air monitoring station commissioned: Meet the latest *Alberta Ambient Air Quality Objectives*

Table 9: Monitoring and Reporting - Air Pollution Control Systems and Ambient Air (Approval to Operate Table 6-2)

Source	Parameter	Frequency	Method of Monitoring	Sample Location
Carbon scrubber for grit recovery facility, during operation seasons	Temperature	Continuous	Online temperature transmitter, record daily average	Influent air stream
	Differential air pressure	Continuous	Online differential air pressure gauge, record daily average	Influent and effluent air stream
Carbon scrubber for grit recovery facility, during operation seasons; Carbon scrubber for screening building 2/3; Carbon scrubber for grit building 2	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Effluent air stream of each carbon scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of each carbon scrubber
Carbon scrubber for Clover Bar biosolids dewatering building	H_2S	Weekly	Portable low range H_2S analyzer, as per the manufacturer's specifications, grab sample	Effluent air stream of the carbon scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of the carbon scrubber
East scrubber; West scrubber; EPT scrubber; and Fermenter scrubber	pH	Continuous	Online pH sensor, record daily average	Recirculation blowdown line, before addition of chemical makeup of each wet scrubber
	ORP	Continuous	Online ORP sensor, record daily average	

East scrubber; West scrubber; EPT scrubber; and Fermenter scrubber	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Influent air stream of each wet scrubber
	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Effluent air stream of each wet scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of each wet scrubber
Ambient air	H_2S	Before ambient air monitoring station commissioned: Daily, when ambient air temperature > 0 °C	Portable low range H_2S analyzer, as per the manufacturer's specifications, grab sample	Fence line of Gold Bar Wastewater Treatment Plant
	H_2S, NO_2, and SO_2	After ambient air monitoring station commissioned: Continuous	*Air Monitoring Directives*, as amended, record 1-hour average and 24-hour average	Ambient air monitoring station
	Temperature			
	Wind speed			
	Wind direction			
Public odour complaints	N/A	When occurring	Document when Gold Bar Wastewater Treatment Plant is alleged and confirmed to be odour source	N/A

Summary of Air Pollution Control System Monitoring

Table 10 and Table 11 contain a monthly summary of the air pollution control system monitoring data. The data is split into two tables for ease of viewing. Appendix D contains the daily air pollution control system data.

Table 10: Air Pollution Control System Report - Part I

Month		East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber			
		pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)
January	Avg	9.50	670.8	0.4	1.3	9.50	700.0	4.2	0.3	9.50	700.0	1.4	22.8	9.50	699.3	1.3	168.5
February	Avg	9.50	670.3	0.3	0.6	9.50	699.9	1.8	133.4	9.51	697.6	0.6	10.5	9.50	700.7	1.0	110.9
March	Avg	9.50	671.1	0.0	0.0	9.50	699.7	2.5	173.1	9.55	700.4	1.3	8.2	9.50	700.1	1.5	2.7
April	Avg	9.50	670.2	0.1	0.0	9.50	700.0	4.1	413.4	9.50	699.1	2.5	10.9	9.50	700.1	1.3	5.7
May	Avg	9.50	672.1	0.0	0.1	9.50	700.1	3.2	326.2	9.50	699.0	1.6	6.4	9.50	699.5	1.1	7.5
June	Avg	9.50	669.0	0.3	0.5	9.72	697.2	6.3	1439.0	9.50	682.8	8.2	3.2	9.67	700.5	8.0	154.6
July	Avg	9.74	635.2	0.6	0.9	9.83	634.8	7.6	211.7	9.75	616.1	15.2	11.3	9.84	641.6	10.3	829.8
August	Avg	9.79	640.8	0.4	2.1	9.79	664.3	7.6	267.0	9.82	632.4	14.5	41.3	9.80	651.7	10.7	540.8
September	Avg	9.79	670.6	0.4	3.9	9.80	669.7	7.0	1378.5	9.80	657.4	11.7	19.1	9.80	666.9	7.1	512.1
October	Avg	9.80	667.4	0.8	7.8	9.80	662.8	5.9	198.5	9.81	654.7	4.3	10.7	9.82	657.6	7.5	1365.8
November	Avg	9.80	671.4	0.1	0.0	9.80	670.0	4.2	430.5	9.81	667.4	4.7	1.5	9.80	680.2	4.7	717.8
December	Avg	9.79	671.5	0.0	0.1	9.78	670.1	10.8	381.6	9.80	666.9	2.4	0.2	9.79	680.4	6.4	484.7

Table 11: Air Pollution Control System Report - Part II

Month		Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
		H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
January	Avg	0.0	283.9	0.00
February	Avg	0.0	187.6	0.00
March	Avg	0.5	114.5	0.00
April	Avg	0.2	178.8	0.00
May	Avg	0.2	28.0	0.00
June	Avg	0.1	983.8	0.00
July	Avg	0.0	618.1	0.0
August	Avg	2.5	241.5	0.0
September	Avg	0.8	77.8	0.0
October	Avg	0.0	291.0	78.0
November	Avg	0.0	113.0	39.5
December	Avg	0.0	31.6	15.3

The annual manual stack survey was submitted to AEP on August 27, 2021.

Assessment of Monitoring Results

For each scrubber, the daily average ORP and pH was maintained above 300 mV and 8, respectively throughout the year in 2021. Refer to Table 12, Summary of Scrubber Operational Issues for more information.

Chemicals Consumed by Scrubbers

As per Section 6 of the Operations Plan, sodium hypochlorite (bleach) and caustic soda are used in the scrubbers for oxidization of H_2S and pH control, respectively. Daily and monthly consumption of these chemicals is summarized in Appendix E.

Summary of Air Pollution Control System Operational Issues

Table 12 is a summary of operational issues encountered by each air pollution control system, and the remedial actions taken to resolve the issues.

Table 12: Summary of Scrubber Operational Issues

Scrubber Name	Date/Time of Shutdown	Date/Time Returned to Service	Total Time Shutdown (hr)	Fence Line H2S Readings Taken?	Operational Issue	Actions Taken
West	2/13/2021 19:00	2/13/2021 19:47	0.8	No - Short shutdown	Foaming in scrubber.	Scrubber was drained and restarted.
West	2/13/2021 22:36	2/13/2021 23:54	1.3	No - Short shutdown	Foaming in scrubber.	Scrubber was drained and restarted.
West	3/15/2021 7:32	3/15/2021 11:53	4.4	Yes	Bleach line leak.	Scrubber outage for bleach line repair. Also cleaning sump overflow line during outage to minimize number of outages.
Fermenter	4/8/2021 4:16	4/8/2021 7:57	3.7	Yes	Tube failure on both bleach pumps.	Scrubber shutdown and emergency work request submitted.
Grit 6/7	4/20/2021	4/20/2021	<12 hours	No	Scrubber shut off due to loose wire in starter.	Loose wiring repaired same shift. Downtime duration unknown.
Grit 6/7	4/26/2021	4/26/2021	<12 hours	No	Scrubber found to be off by Operations during daily rounds.	Work request submitted for Maintenance. Scrubber is interlocked with MUA low temp cutoff. HVAC technician inspected MUA. Downtime duration unknown. Work request submitted to add scrubber status to DeltaV to track scrubber downtime.
Fermenter	5/3/2021 10:08	5/3/2021 12:13	2.1	No - Short shutdown	Planned shutdown	Inspection and media sampling.
West	5/10/2021 7:01	5/10/2021 12:34	5.5	Yes	Planned outage for maintenance.	Recirculation pump repaired.
East	6/1/2021 22:15	6/1/2021 22:35	0.3	No - Short shutdown	Pump room sump overflowed	installed 2 submersible pumps and unblocked drains
West	7/9/2021 15:44	7/9/2021 17:35	1.9	Yes	Issues with the blower	EI bypassed the motor control block to keep the blower running.
West	7/10/2021 9:25	7/10/2021 10:04	0.7	Yes	Blower troubleshooting.	EI fixed the issues identified on 7/9/2021
East	7/10/2021 22:33	7/11/2021 0:21	1.8	No - Short shutdown	East scrubber tower/ chemical room exhaust fan is not communicating to DeltaV (GEF-71409)	Issued a work request for maintenance to investigate. Repaired by maintenance.
West	8/3/2021 22:52	8/4/2021 4:15	5.4	Yes	Recirculation pump was seized	Recirculation pump repaired.
West	8/4/2021 13:58	8/4/2021 14:33	0.6	No - Short shutdown	Water softeners tripped off during regeneration. West scrubber lost level temporarily	Reset softener and west scrubber put back into service

West	8/9/2021 6:06	8/9/2021 17:02	10.9	Yes	Planned outage for maintenance.	Replaced recirculation pump
EPT	8/9/2021 6:32	8/9/2021 17:04	10.5	Yes	Planned outage for maintenance.	Installed new softner piping
East	8/10/2021 10:10	8/10/2021 11:59	1.8	No - Short shutdown	East scrubber sump pumps not working	Mechanical fixed the East scrubber sump pumps
EPT	8/12/2021 13:32	8/12/2021 14:43	1.2	No - Short shutdown	Planned outage for maintenance.	Recirculation pump adjustment
EPT	8/19/2021 6:30	8/19/2021 8:30	2.0	Yes	Planned outage for maintenance.	Maintenance work completed
EPT	8/23/2021 13:46	8/23/2021 14:01	0.2	No - Short shutdown	Communication fault on the blower motor	E&I fixed communication
East	9/20/2021 18:49	9/20/2021 19:01	0.2	No - Short shutdown	Scrubber level was dropping	Adjusted fill valve and shut down recirc pump
Fermenter	10/19/2021 8:27	10/19/2021 13:12	4.8	Yes	Leak in caustic line	Caustic leak fixed
Fermenter	11/9/2021 6:04	11/9/2021 17:02	11.0	Yes	Fermenter scrubber shut down for maintenance work	Work completed, fermenter scrubber back in service
East	11/18/2021 5:58	11/18/2021 14:54	8.9	Yes	Planned maintenance	maintenance finshed
Grit 6/7	11/24/2021 0:20	11/24/2021 3:04	2.7	No – Cold Temps	Carbon scrubber failure due to electrical issues related to cold air temperatures	The scrubber was up and running in hand only as temporary strategy. E&I fixed the issue later. Fenceline H2S meter reading not taken due to low temperature.
East	11/25/2021 6:43	11/25/2021 7:06	0.4	No - Short shutdown	Plant shutdown due to Hardisty power supply failure	Switched to backup power supply and restored the scrubber operation
West	11/25/2021 6:43	11/25/2021 7:06	0.4	No - Short shutdown		
EPT	11/25/2021 6:43	11/25/2021 7:06	0.4	No - Short shutdown		
Fermenter	11/25/2021 6:43	11/25/2021 7:06	0.4	No - Short shutdown		

2021 Annual Ambient Air Report

Summary of Ambient Air Monitoring

Table 13 shows a summary of the ambient air monitoring results. The grab samples were taken daily when the ambient air temperature was > 0°C using a portable, low-range H_2S analyzer along the fence line of the Gold Bar Wastewater Treatment Plant. Figure 3 depicts the monitoring locations. Appendix F contains the daily ambient air monitoring data.

Table 13: Summary of Ambient Air Monitoring Results

Month		H_2S (ppb)							
		1	2	3	4	5	6	7	8
January	Avg	3.87	1.28	0.51	0.85	0.72	0.95	1.05	0.34
	Min	0	0	0	0	0	0	0	0
	Max	23.09	5.98	5.14	5.54	4.98	8.28	10.90	7.91
February	Avg	3.38	1.66	0.81	2.09	1.86	2.53	2.26	0.53
	Min	0	0	0	0	0	0	0	0
	Max	12.97	4.95	3.77	11.12	6.32	20.40	18.71	3.84
March	Avg	1.67	0.75	0.69	0.58	0.11	0.00	0.13	0.36
	Min	0	0	0	0	0	0	0	0
	Max	12.04	6.36	7.22	6.13	3.45	0.00	4.06	4.86
April	Avg	1.02	0.72	0.14	1.34	0.00	0.05	0.33	0.35
	Min	0	0	0	0	0	0	0	0
	Max	6.80	5.97	4.22	11.08	0	1.40	3.48	4.04
May	Avg	0.90	0.86	0.40	1.45	0	0.00	0.00	0.27
	Min	0	0	0	0	0	0	0	0
	Max	9.96	14.65	5.10	22.59	0	0	0	4.89
June	Avg	3.69	1.55	0.87	2.09	0.12	0.40	1.04	0.38
	Min	0	0	0	0	0	0	0	0
	Max	25.02	7.56	7.77	9.67	3.60	4.12	5.73	7.78
July	Avg	18.58	1.45	2.43	3.85	0.33	1.18	3.62	1.01
	Min	0	0	0	0	0	0	0	0
	Max	189.00	5.58	24.09	19.09	3.67	10.44	54.06	5.51
August	Avg	8.41	1.73	0.51	2.04	0.00	0.77	0.88	0.66
	Min	0	0	0	0	0	0	0	0
	Max	68.06	23.88	5.53	24.92	0.00	5.04	10.32	13.55
September	Avg	10.52	2.49	0.86	1.07	1.27	1.17	3.78	1.61
	Min	0	0	0	0	0	0	0	0
	Max	53.45	23.30	5.05	11.39	15.48	6.56	47.56	38.54
October	Avg	6.68	1.15	0.42	0.65	0.10	0.30	1.83	0.85
	Min	0	0	0	0	0	0	0	0
	Max	33.20	7.10	6.21	8.28	3.04	5.65	19.47	9.42
November	Avg	6.99	1.45	1.12	1.93	1.12	0.74	3.00	1.01
	Min	0	0	0	0	0	0	0	0
	Max	81.79	10.12	7.46	12.11	6.21	7.13	15.50	5.89
December	Avg	7.36	2.78	1.28	2.59	2.70	4.61	3.13	0.62
	Min	0	0	0	0	0	0	0	0
	Max	42.14	5.91	4.08	11.17	5.47	8.28	14.60	4.75

Figure 3: Location of H_2S Monitoring

Summary of Public Odour Complaints

Table 14 shows the number of odour complaints received within the Gold Bar WWTP Odour Response Boundaries and number of complaints where Gold Bar WWTP is the confirmed source of odour based on wind direction, scrubber operation, corroboration with odour model software, ambient H_2S monitoring results, and plant operations/maintenance.

Table 14: Summary of Gold Bar WWTP Odour Complaints

Month	Number of Odour Complaints	Number of Complaints where Gold Bar WWTP is the Confirmed Source of Odour
January	1	0
February	0	0
March	3	1
April	1	1
May	2	0
June	1	1
July	3	1
August	0	0
September	1	0
October	1	0
November	0	0
December	0	0
Total	**13**	**4**

Appendix G contains a detailed list of odour complaints including the steps taken to identify the odour sources and remedial actions taken to resolve the odour issues.

2021 Summary of Contraventions and Notifications to AEP

Table 15 summarized the contraventions to Approval to Operate 639-03-06. There were two contraventions in 2021.

Table 15: Summary of Contraventions

Date	Summary of Contravention	AEP Reference Number
10/19/2021 7:50 am AEP Operator: Dave	Reported a contravention to the operating approval to 24h AEP reporting line. On October 15, 2021 daily H2S fence line grab samples were not taken as required by approval table 6-2. 7-day letter will be submitted.	384730
11/25/2021 10:50 am AEP Operator: Erin	Reported to 24h AEP unplanned power outage occurred at Gold Bar WWTP line that started at 6:44 am and lasted for approximately 4 minutes. During this time UV disinfection process was out of service and approximately 0.45 ML of non-disinfected secondary effluent was discharged to the NSR. 7day letter to be provided.	385858

Table 16 summarizes the notifications to AEP under Approval to Operate 639-03-06 as per the 2021 Operations Plan. There were seven notifications in 2021.

Table 16: Summary of Notifications to AEP

Date	Summary of Notifications	AEP Reference Number
2/16/2021 11:10 am AEP Operator: Erica	AEP 24-hour hotline was notified of a planned UV outage from 9:00 pm on February 24, 2021 to 9:00 am on February 25, 2021 and then again from 9:00 pm on February 25, 2021 to 9:00 am on February 26, 2021 for planned maintenance on the electrical system (major breaker change out). It was noted that EPCOR purposely plans the shutdowns to take place over night because this is when wastewater flows are low, and impact to the river is minimized.	376111
2/26/2021 9:45am AEP Operator: Taryn	Notified of date change to previous notification of planned temporary reduction in target treatment capacity from 1200 MLD to 750 MLD for conventional and enhanced primary treated wastewater flows for planned capital work. Outage started October 1, 2020 and will now proceed until end of day March 2, 2021.	372020
6/8/2021 1:33 pm AEP Operator: Natasha	AEP 24-hour hotline was notified of a planned UV outage between 7 am and 8 am on June 15, 2021 for planned maintenance on the electrical system (transformer switching). The actual outage only lasts a few minutes, but it will take place in this period. It was also noted that EPCOR purposely plans the shutdowns to take place over night because this is when wastewater flows are low, and impact to the river is minimized	379748
7/7/2021 4:13 pm AEP operator: Erica	A notification was made to AEP at 4:13 pm using the 24-hour reporting line that a study led by our projects group using Lithium Chloride as a tracer to evaluate the mixing efficiency of our digesters will begin on July 14, 2021 and last for approximately 60 days. Digested sludge with the tracer will flow to Clover Bar lagoons, which is also part of EPCOR Gold Bar WWTP Operations.	380915
9/23/2021 3:10pm AEP Operator: Raymond	Notified of planned temporary reduction in target treatment capacity from 1200 MLD to 750 MLD for conventional and enhanced primary treated wastewater flows for planned capital work. Change to start September 28, 2021 and proceed until March 1, 2022.	383842

11/25/2021 5:00 pm AEP Operator: not available	Reported to 24-hour AEP hotline at approximately 1 pm that a suspected Snowy Owl landed into the centre of lagoon Cell 3W at the Clover Bar lagoons. The Strathcona Raptor Shelter was contracted but was unable to offer any assistance in trying to rescue the owl. A determination was made that there was no safe means of rescue and the bird could not exit on its power. Unfortunately the bird perished.	385858
11/25/2021 12:55 pm AEP Operator: Erica	AEP 24-hour hotline was notified of a planned UV outage starting at approximately 1:30 pm on Nov 25, 2021 for switching the plant from its backup power feed to its primary power feed. The UV outage will be less than 10 minutes. Confirmed this is a notification only, not contravention of the approval.	385864

2021 Biosolids Program Summary

In 2021, the biosolids management program was able to remove 30,763 dry tonnes (DT) of biosolids from the Clover Bar Lagoons for beneficial reuse. Biosolids production from Gold Bar and ACRWC was 24,844 DT, which increased the storage inventory by 6,279 DT.

Table 17: Summary of Biosolids Program

Beneficial Application Use Method	Application Weight (dry tonnes)	Application Volume (m^3)
Nutri-Gold (dewatered material)	5,958 (2512 in stockpile)	25,353
Nutri-Gold (thickened material)	5,843	89,892
Agricultural Land Application (3rd party)	12,947	199,185
Non-Agricultural Land Application	6,015	25,596
Total	30,763	340,026

Appendices H, I, and J contain summaries of the Nutri-Gold, third party agricultural, and non-agricultural land application programs, respectively.

Part II: Wastewater Collection System Report

EPCOR Water Services Inc.
Drainage Services
Edmonton, Alberta

2021
Annual Wastewater Collection System Report

SUBMITTED TO:

The Province of Alberta

Alberta Environment and Parks (AEP)

As per requirements of:

APPROVAL NO. 639-03-06

February – 2022

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2021 Overview

EPCOR Drainage Services provides wastewater and stormwater drainage services to City of Edmonton (the 'City') residents by planning, building, operating, and maintaining the pipes, tunnels, pump stations, and stormwater management facilities that make up the drainage network.

Project Management and Engineering are responsible for projects that are in the preliminary design or detailed design phase. They manage in-house engineering design, cost estimation, and drafting. Projects include new sewer infrastructure projects like tunnels, pipes, manholes, wetlands, and the coordination of sewer rehabilitation work.

Drainage construction services is responsible for the in-house construction and emergency repairs on the collection systems. The rehabilitation construction team uses a wide variety of construction methods to rehabilitate the system and build for growth using open-cut and trenchless techniques. The customer construction group completes service connections, renews existing drainage assets, and completes emergency and high priority repairs.

Infrastructure like sewers and structures in the drainage system require ongoing maintenance. Drainage Services Operations — which includes pipeline maintenance, flow-control facilities, monitoring and compliance, and operations engineering — inspect and monitor drainage systems to ensure service to customers is maintained and to optimize the short-term maintenance required. They also reduce the possibility of customer sewer back-ups caused by service connection blockages and minimize disruptions to the public.

Drainage Services are supported by a number of other groups throughout EPCOR such as Public and Governmental Affairs, Supply Chain Management, Fleet and Equipment, Facilities and Finance.

Collection and conveyance of wastewater and stormwater is carried out through the drainage system which consists of sanitary and stormwater collection infrastructure.

The sanitary collection infrastructure includes more than 2,800 km of sanitary sewer, over 800 km of combined sanitary and storm sewer that connect all customers to sanitary trunk sewers. Sanitary trunks then deliver wastewater directly to the Gold Bar Wastewater Treatment Plant (WWTP).

A portion of the conveyance of wastewater is covered under a Wastewater Exchange Agreement between EPCOR and the Alberta Capital Region Wastewater Commission (ACRWC). The ACRWC Treatment Plant takes wastewater from Clareview in northeast Edmonton and from the Clover Bar Industrial Area. In exchange, the sanitary collection system conveys wastewater from the south members (City and County of Leduc, and the Town of Beaumont) for treatment at the Gold Bar WWTP.

The stormwater collection infrastructure includes over 3,300 km of storm sewer, 62,000 catch basins, and 12,500 catch basin manholes. This stormwater collection infrastructure is connected to stormwater trunk sewers. Storm trunks then discharge stormwater to natural watercourses, i.e. creeks and the North Saskatchewan River, through one of 262 outfalls. Strategically placed within the stormwater collection system are 295 stormwater management facilities which provide flood prevention, peak-flow attenuation, and treatment through stormwater retention.

Between the sanitary/combined sewer system and stormwater system there are 90 pumpstations which ensure proper servicing to EPCOR's customers in Edmonton.

In 2021, EPCOR's Drainage capital and operational projects focused on the improvement and expansion of the underground infrastructure system, reduction of odour nuisances and protection of the drainage infrastructure due to corrosion. This work was done through its in-house construction expertise, performing open-cut and tunnel construction, as well as specialized equipment such as tunnel boring machines.

In 2019, Edmonton City Council approved EPCOR's Stormwater Integrated Resource Plan (SIRP) to provide a risk-based approach to prioritize investments in stormwater infrastructure. SIRP was identified by the City as one of the action items to support overall City ability to adapt to changing climate conditions and aligned with the City's Climate Change Adaptation and Resiliency Strategy. The risk methodology captures capacity, condition, environmental, and social factors on a risk grid overlaid on a map of the City's neighbourhoods. The goal is to slow, move, secure, predict, and respond to flooding events to prevent or reduce the impact. Key actions in 2021 under the SIRP themes included;

- Slow
    - Continue to engage with the City of Edmonton on Phase 2 of the review process for each dry pond.
    - Implementation of LID in conjunction with planned roadway construction and neighbourhood initiatives.
- Move
    - Incorporation of piping modifications required to accommodate approved dry ponds identified in the SLOW theme.
- Secure
    - Continue the implementation of the maintenance program for Inflow/Infiltration reduction.
    - Develop the overall impacts and implementation plan for automatic gates in river valley outfalls in the Rossdale neighbourhood
    - Implementation of the containment tower to reduce the risk of surcharge at Calgary Trail South and the associated collaboration effort with all stakeholders
    - Implementation of the Enhanced Flood Proofing Program and targeted outreach to the higher risk properties to promote backwater valve installations and additional on premise flood proofing activities.
- Predict
    - Continue the implementation of the SIRP Dashboard project to enable improved situational awareness during flooding events.
    - Implementation of automatic gates in stormwater management facilities within storm basins in Mill Woods and incorporation to the SIRP Dashboard for real time control capability.
- Respond
    - Continue to support emergency response improvements in the higher risk areas, including working with property owners and the City of Edmonton to update emergency response plans for impacted areas.

The formation and release of hydrogen sulphide (H2S) gas from the sewer system negatively impacts communities, corrodes infrastructure, and makes maintenance and inspection challenging. The Corrosion and Odour Reduction (CORe) Strategy continued in 2021 and key actions under the CORe themes included;

- Prevent
    - Continue the design and construction process on the Duggan bypass tunnel.
    - Continue to construct access manholes and implement trunk inspection and cleaning activities.
    - Continue to implement rehabilitation projects in emerging locations.
- Optimize
    - Implement the improvements to pump stations with chemical treatment capability.
- Monitor
    - Continue to purchase additional odour monitoring equipment and explore additional synergies with SIRP Predict theme.
- Control
    - Continue to modify existing drop structures.

Drainage Services is fully committed to the protection of the environment and the health and safety of its employees, customers, and neighbours. Health and safety and the environment (HSE), including public health safety, is one of the top priorities of EPCOR. In order to continually improve our environmental performance, Drainage Services operates with an ISO 14001:2015 registered Environmental Management System (EMS). In 2021 Drainage Services completed registration of an integrated management system that operates according to the ISO14001:2015 standard and the ISO 45001:2014 standard for Safety Management Systems.

As required by Approval #639-03-06, EPCOR - Drainage Services is submitting the 2021 Annual Wastewater Collection System Report.

This Annual Wastewater Collection System Report submission includes: 2021 Drainage Services Capital Program summary, Interconnection Control Strategy Annual Report, Collection System Monitoring and Assessment Annual Report, and Collection System Operational details.

TABLE 1: Summary of 2021 Completed Projects and Planned Major Rehabilitation Projects

Program/Project	Completion
Drainage System Expansion	
Imagine Jasper	Dec-2021
Yellowhead Trail Freeway Conversion (Area 2)	Dec-2021
Yellowhead Trail Freeway Conversion (Area 3)	Dec-2021
SWMF Safety Review (Phase II)	Aug-2022
50 Street Wide & CPR Sewer Relocate	Dec-2022
Servicing for Downtown Intensification (105 Sewer Lateral Project)	Dec-2023
Drainage System Rehabilitation	
Metro LRT PH1 Sewer Relocate	Jan-2021
2019-2020 Pump Station Rehabilitation	Jan-2021
127 Street & 153 Avenue Sanitary Chamber Repair	Mar-2021
Westridge Subsidence	Mar-2021
Larkspur Pond Pump Replace	Jun-2021
Double Barrel SAN-11	Jun-2021
RTC #4 Stop Logs Rehabilitation	Jul-2021
Outfall #51 - Rehab	Aug-2021
Trestle #5	Nov-2021
Buena Vista / Laurier Height Pump Station	Dec-2021
Clareview Sanitary Trunk Rehabilitation	Dec-2021
Large Trunk Rehabilitation: Area S-1	Dec-2021
2019 Outfall Rehabilitation	Dec-2021
2020 Drill Drop Manhole Rehab/Replacement	Dec-2021
2021 Culvert Replacements	Dec-2021
2021 Outfall Rehabilitation	Dec-2021
Cloverbar Valve, Chamber & Piping Rehab	Jun-2022
SAN-11 (Phase II)	Aug-2022
Outfall #80 - Rehab	Nov-2022
Outfall #154 - Rehab	Nov-2022
Gold Bar Utilidor (PW552 and 147) Rehabilitation	Dec-2022
Large Trunk Rehabilitation: Area S-2a	Dec-2022
NL1 Sanitary Chamber Rehab	Dec-2022
Pump Station #171 (Walterdale)	Dec-2022

Pump Station #159 (Dunluce)	Dec-2022
Large Trunk Sewer - NL2 Rehab	Dec-2022
2021 Pump Station Rehabilitation	Dec-2022
2021 Drill Drop Manholes Rehabilitation	Dec-2022
Large Trunk Rehabilitation 151 Street South (Phase 1)	Dec-2023
151 Street & 99 Avenue Sanitary Trunk Rehab (Phase II)	Nov-2024
West Valley Line LRT Sewer Relocation	Dec-2024
2019 Trunk Sewer Rehabilitation - Area C-2	Dec-2024
Mill Creek Combined Trunk Rehabilitation	Dec-2024
Capital Line LRT	Dec-2025
Environmental Quality Enhance	
2020 Environmental Enhancement	Nov-2021
Pump Station Optimization	Dec-2021
2021 Low Impact Development on Public Lands	Dec-2021
LID on Commercial Sites	Dec-2021
2021 Drop Structure Modifications	Dec-2021
2020 Pump Station Treatment	Dec-2021
2019-2021 Manhole Access	Dec-2021
2019 - 2021 Drop Shaft Modifications	Dec-2021
2021 Pump Station Enhancements	Dec-2021
Cloverbar Cell # 1-4 Redevelopment (Cell 3E Relining)	Dec-2021
2021 Ventilation Control Program	Jul-2022
2021 Environmental Enhancement Program	Dec-2022
Flood Mitigation	
Parkallen Dry Pond (PA1)	Aug-2021
Tweddle Place	Dec-2021
2020 Overland Drainage	Dec-2021
Proactive Manhole Sealing	Dec-2021
Proactive Pipe Relining	Dec-2021
2021 Manhole Relining and Insert	Dec-2021
17 Street & Aurum Road Culvert Replacement	Dec-2021
2021 Overland Drainage	Dec-2021
2021 Emergency Response Equipment	Mar-2022
Ermineskin / Steinhauer	Oct-2022
Rideau Park, Empire Park, Duggan Upgrade	Oct-2022

Parkdale Dry Pond	Dec-2022
2021-2022 Proactive Manhole Sealing	Dec-2022
Gateway Boulevard Geyser	Dec-2022
2021 Outfall Gates	Jan-2023
2021 Proactive Pipe Relining-Sanitary & Combined	Apr-2023
Pump Station #241 (North Griesbach)	Nov-2023
Malcolm Tweddle & Edith Rogers Dry Ponds	Dec-2023
Kensington Dry Pond and Sewer Separation	Dec-2023
Kenilworth Dry Pond	Dec-2024
Lauderdale West Dry Pond	Dec-2025
SSSF Projects	
SW1 Pump Station Upgrades	Aug-2021
SW5	Dec-2021
NEST NC2 & NC3	Aug-2022
SESS SA10A	Aug-2022
SESS SW4	Dec-2023

Interconnection Control Strategy

EXECUTIVE SUMMARY

In response to a requirement in the 1995 Approval to Operate (No. 95-MUN-117), Drainage Services prepared an Interconnection Control Strategy. Through this Strategy, EPCOR embarked on its mitigation and monitoring program in the context of “perpetual monitoring and assessment” (Figure 1).

An interconnection is designed to allow sanitary or combined sewage to overflow into the storm system, in order to relieve the sewer system under high flow conditions. Since 1998, a program has been in place to minimize the contamination of stormwater with sanitary sewage by monitoring, assessing and eliminating or mitigating all interconnections between the two systems. This will reduce the total loading of contaminants to the North Saskatchewan River.

Under the current Approval (639-03-06), issued in 2020, EPCOR intends to continue with the existing processes and reporting through the Wastewater System Operations Plan. This report presents summaries of: status and mitigation activities for known and newly discovered interconnections (I/Cs); results of the 2021 monitoring program; and status of the Interconnection Rectification Assessment project.

Interconnection Status

During 2021, no new I/C sites were discovered and no sites were closed. The I/C count for December 31, 2021 stands at 117 open I/Cs and 287 corrected sites (total 404).

The total monies spent on remedial work for I/C control in 2021 was $73,000.

Interconnection Monitoring

As of December 31, 2021, 110 of the 117 open I/Cs had monitoring devices. One dry weather overflow (DWO) was discovered in 2021.

Interconnection Rectification Assessment Project

Two consultants were hired in 2002 and 2003 to carry out the rectification assessment of about 90 and 40 sites, respectively. Their work focused mainly on active I/Cs and I/Cs with DWOs. Previous studies and monitoring data were utilized to quantify I/Cs activity, support sewer system assessment, and provide conceptual and preliminary design for remedial works. These assessment studies were completed in 2004 and EPCOR has been following up with the recommended mitigation work since. New assessment projects will commence once this construction is largely completed.

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1.0 INTRODUCTION

An Interconnection Control Strategy was prepared by EPCOR in response to a requirement by Alberta Environment, as part of the 1995 Approval. This program to minimize the contamination of stormwater by sanitary sewage, has been in effect since 1998.

A key commitment of the Interconnection Control Strategy is perpetual monitoring and assessment for all unmitigated interconnections (see Figure 1). This consists of identification, maintenance of data, evaluation, monitoring, correction, elimination and mitigation.

The focus of interconnection monitoring activities is to collect information on the frequency and duration of discharges from all interconnection (I/C) sites. The evaluation of the data for all sites is the core component of the assessment. All sites are to be evaluated annually for further action. More detailed monitoring will be conducted at highly active sites. Corrective measures will be taken at inactive sites or active sites where sufficient data has been collected and analyzed indicating that they can be safely closed. Monitoring information will be used as the basis for decisions in terms of remedial activity.

As part of the current Approval (639-03-06) issued in 2020, the *Interconnection Identification and Control Strategy* is continuing to be a component of the *Wastewater Collection System Operations Plan*. The *Wastewater Collection System Monitoring Protocol* includes the collection of overflow data from open (active) interconnection sites. This Protocol was submitted to Alberta Environment in 2007 and has been maintained since.

Through the *Wastewater Collection System Operations Plan*, EPCOR has committed to continue with the Interconnection Control Strategy and annual reporting of the I/C status by February 28 of each year. The intent of the annual report is to document changes and status of the I/Cs, including any corrections or closures, and to provide an updated I/C database. The following report documents the I/C status for 2021.

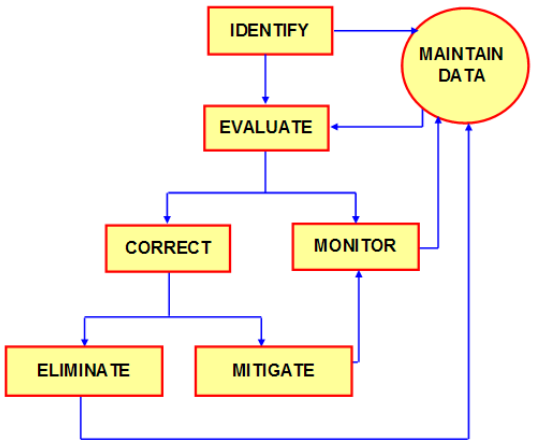

Figure 1 Interconnection Control Strategy Perpetual Monitoring and Assessment

2.0 MITIGATION MEASURES

On January 1, 2021 there were a total of 404 I/Cs. This consisted of 117 open I/Cs and 287 corrected (closed) I/Cs. The I/C count for December 31, 2021 stands at 117 open I/Cs and 287 corrected sites (total 404).

The enclosed plan "2021 Status and DWO Locations" shows the locations of all of the open I/Cs in the city. A database of I/C sites is located in Appendix A. Figure 2 shows the cumulative number of I/Cs over time.

2.1 CONSTRUCTION

The mitigation measures undertaken in 2021 include;

- Design work towards mitigating interconnections in Queen Mary Park, Oliver, and Callingwood.

Figure 2 2021 Cumulative Number of Interconnections

2.2 COSTS

In 2021, the amount spent was $22,500 on construction work as well as $39,000 for monitoring the network.

In summary, the expenditures for the Interconnection Control Strategy each year from 1994 to 2021 include:

- Monitoring program – approximately $99,000 annually.
- Investigations consisting of inspection of the sewers to confirm or refute the occurrence of overflows – approximately $9,000 annually, paid for under regular operating budget (repair, blockage removal or bypass pumping costs are not included).
- Correcting the interconnections based on I/C monitoring and assessment. This can involve closure of an interconnection to eliminate overflow or raising the weir to reduce overflow frequency - approximately $509,000 annually.
- Assessing I/C sites for possible closure – approximately $61,000 annually (although the assessments are conducted on an intermittent basis).

Table 1 Interconnection Control Strategy Expenditure Summary

Year	Dollars Spent				Total
	Monitoring	Investigation	Correcting	Assessing	
1994	$0	$0	$195,000	$50,000	$245,000
1995	$40,000	$0	$0	$960,000	$1,000,000
1996	$50,000	$0	$30,000	$0	$80,000
1997	$213,000	$0	$634,000	$0	$847,000
1998	$140,000	$2,205	$197,500	$0	$339,705
1999	$104,600	$5,760	$762,200	$0	$872,560
2000	$103,000	$8,100	$834,000	$0	$945,100
2001	$122,000	$5,265	$319,000	$168,000	$614,265
2002	$149,204	$3,360	$210,000	$133,319	$495,883
2003	$145,047	$2,340	$1,055,000	$367,897	$1,570,284
2004	$97,910	$3,350	$1,221,300	$1,033	$1,323,593
2005	$91,280	$3,600	$1,067,400	$16,896	$1,179,176
2006	$92,871	$2,600	$350,000	$0	$445,471
2007	$137,920	$3,197	$100,259	$0	$241,376
2008	$124,345	$3,329	$1,505,424	$0	$1,633,098
2009	$128,668	$3,570	$740,507	$0	$872,746
2010	$134,362	$5,300	$29,931	$0	$169,594
2011	$105,796	$7,950	$122,210	$0	$235,955
2012	$90,512	$11,918	$193,000	$0	$295,430
2013	$85,936	$21,491	$539,171	$0	$646,598
2014	$97,713	$23,606	$1,750,427	$0	$1,871,747
2015	$127,257	$22,507	$1,022,873	$0	$1,172,636
2016	$98,399	$11,338	$688,140	$0	$797,877
2017	$66,869	$8,884	$304,455	$0	$380,208
2018	$70,803	$15,907	$108,640	$0	$195,349
2019	$59,305	$29,360	$130,000	$0	$218,665
2020	$44,696	$40,056	$145,548	$0	$230,299
2021	$39,225	$10,919	$22,500	$0	$72,644
Total	**$2,760,717**	**$255,912**	**$14,278,485**	**$1,697,145**	**$18,992,259**
Annual Ave.	**$98,597**	**$9,140**	**$509,946**	**$60,612**	**$678,295**
Proportion	**14.5%**	**1.3%**	**75.2%**	**8.9%**	

3.0 2021 MONITORING AND ASSESSMENT RESULTS

In 2017, a project was initiated to replace the loggers at all monitored interconnection sites. Data collection from the old style of logger was completed by driving a vehicle past each site, sometimes having to stop in traffic and place an antenna through the manhole cover. The new loggers are now equipped with cellular communication and no longer require a 'drive-by' to retrieve data.

Benefits to upgrading the loggers include;

- Decrease the safety risk exposure of the contractor by not requiring vehicle based data collection
- Increased data collection frequency from weekly to every 6 hours
- More data streams collected including battery voltage, signal strength, and temperature.
- Cost reduction by using cellular technology. Labour costs of collecting data are eliminated which were more than cellular service fees.
- Improved asset management as battery replacement can be planned to occur at the correct time, not too early or too late. Other data streams will help diagnose other problems as well.
- Sites not accessible by vehicle can now have sensors and loggers installed.

In the Interconnection Control Strategy, EPCOR committed to perpetual monitoring and assessment of all I/Cs. As of December 31, 2021, 110 of the 117 I/Cs had crest gauge type monitors equipped with cellular data loggers.

The rectification studies completed in the past, alongside the historical activity data for the I/C sites sets a well-defined history to draw on to inform management decisions on a go forward basis.

3.1 DRY WEATHER OVERFLOWS (DWOS)

In 2021, 57 investigations of possibly overflowing sites were made with 1 Dry Weather Overflow discovered.

3.2 INTERCONNECTION SITE ACTIVITY CHARACTERISTICS SUMMARY

As shown in Table 2 below, about 3% of the sites were found to have dry weather overflows each year during monitoring from 1997 to 2021, with an average of 2% over the past 5 years. These are the events of critical concern to the environment. Although only 2% of the sites experience dry weather overflow in a given year, different sites overflow each year. A total of 29% of the known open I/Cs (34 sites) have had a dry weather overflow event.

Table 2 Interconnection Site Activity Characteristics Summary

Year	Known I/C Sites	I/C Sites Monitored	Dry Weather Overflow	Rainfall Correlated	Inactive Sites	Unverified Overflows
1997	186	182	N/A	65	109	8
1998	188	179	3	72	64	43
1999	188	176	6	48	92	29
2000	186	173	6	36	76	56
2001	185	174	7	37	75	55
2002	179	161	6	29	110	16
2003	167	153	5	34	102	12
2004	155	139	5	64	51	19
2005	150	131	9	16	88	18
2006	151	131	5	39	70	17
2007	142	126	2	21	87	16
2008	142	126	3	25	75	24
2009	141	127	2	10	81	28
2010	133	118	3	17	72	26
2011	129	118	3	---	---	---
2012	121	113	4	---	---	---
2013	121	113	1	---	---	---
2014	124	113	2	---	---	---
2015	123	112	0	---	---	---
2016	120	112	0	---	---	---
2017	121	68	4	---	---	---
2018	116	93	4	---	---	---
2019	117	103	3	---	---	---
2020	117	110	2			
2021	117	110	1			
Average	**145**	**130**	**4**	**37**	**82**	**26**
Proportion of Monitored Sites =			**2.7%**	**28%**	**63%**	**20%**

4.0 RECTIFICATION ASSESSMENT PROJECT SUMMARY

Two consultants were hired in 2002 and 2003 to carry out the second phase of a large-scale Interconnection Rectification Assessment project. The first project included about 90 I/C sites and the second included about 40 sites. Their work was focused mainly on active and DWO I/Cs. This work identified many I/Cs that could be closed if funds are available.

Previous studies and monitoring data collected between 1998 and 2003 were utilized to quantify interconnection activity, support sewer system assessment, and provide conceptual and preliminary design for remedial works. Major work requirements for this rectification assessment included:

- Perform sewer system data collection and field surveys
- Carry out sewer condition and hydraulic assessment
- Evaluate various remedial measures
- Develop conceptual and preliminary design plans
- Provide Cost estimates

A computer model called MOUSE (Model For Urban Sewers) developed by DHI (Danish Hydraulics Institute) was employed in these studies to simulate the existing system and recommend remedial measures under various wet weather flow conditions. Simulation results such as hydraulic grade line and by-pass volume were summarized and evaluated to ensure that an improved level of control can be achieved, and that proposed improvements would not cause other system problems.

These two assessment projects were completed in 2004 and we have been following up with construction of the recommended mitigation works since that time. The assessments identified a long list of construction works that will absorb the funding for the next several years. New assessment projects will commence once this construction is largely complete.

In 2018, a review of select neighbourhoods was done in addition to the rectification detailed design works. Further recommendations for interconnection closure work has been developed beyond the conceptual design phase. EPCOR will evaluate these recommendations alongside infrastructure plans of other programs such as neighbourhood rehab and the Stormwater Integrated Resource Plan (SIRP).

EXECUTIVE SUMMARY

In response to a requirement in the 1995 Approval to Operate (No. 95-MUN-117), Drainage Services prepared an Interconnection Control Strategy. Through this Strategy, EPCOR embarked on its mitigation and monitoring program in the context of “perpetual monitoring and assessment” (Figure 1).

An interconnection is designed to allow sanitary or combined sewage to overflow into the storm system, in order to relieve the sewer system under high flow conditions. Since 1998, a program has been in place to minimize the contamination of stormwater with sanitary sewage by monitoring, assessing and eliminating or mitigating all interconnections between the two systems. This will reduce the total loading of contaminants to the North Saskatchewan River.

Under the current Approval (639-03-06), issued in 2020, EPCOR intends to continue with the existing processes and reporting through the Wastewater System Operations Plan. This report presents summaries of: status and mitigation activities for known and newly discovered interconnections (I/Cs); results of the 2020 monitoring program; and status of the Interconnection

Rectification Assessment project.

Interconnection Status

During 2020, no new I/C sites were discovered and no sites were closed. The I/C count for December 31, 2020 stands at 117 open I/Cs and 287 corrected sites (total 404).

The total monies spent on remedial work for I/C control in 2020 was $230,000.

Interconnection Monitoring

As of December 31, 2020, 110 of the 117 open I/Cs had monitoring devices. Two dry weather overflows (DWO) were discovered in 2020.

Interconnection Rectification Assessment Project

Two consultants were hired in 2002 and 2003 to carry out the rectification assessment of about 90 and 40 sites, respectively. Their work focused mainly on active I/Cs and I/Cs with DWOs. Previous studies and monitoring data were utilized to quantify I/Cs activity, support sewer system assessment, and provide conceptual and preliminary design for remedial works. These assessment studies were completed in 2004 and EPCOR has been following up with the recommended mitigation work since. A long list of construction works has been identified that will absorb the funding for the next several years. New assessment projects will commence once this construction is largely completed.

APPENDIX A

Interconnection Database
December 31, 2021

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
ACTIVE INTERCONNECTIONS																			
12	97-177	241869	313225	046	T3	146	SUMMIT D	30	71	30	49	HIGH PIPE		FALSE	RIVER	LEFT	1650	Crestwood	1
14	96-041	315813	313224	803		W142	S. SUMMI	30	61	55	61	OVERFLOW		FALSE	RIVER	LEFT	1650	Glenora	2
15	97-174	256174	343204	880		136	S102	138	43	43		OVERFLOW		FALSE	CREEK	LEFT	375	Glenora	3
16	96-040	239447	313223	801		ST GEORGE		122	55	29	55	LOW PIPE		FALSE	RIVER	LEFT	200	Glenora	4
17	97-176	239449	313223	802		E135	SVICTORI	123	43					FALSE					5
18	96-085	255955	343203	813	435	134	ST GEOR	124	64	29	64	HIGH PIPE		FALSE	CREEK	LEFT	200	Glenora	6
19	96-084	255954	343203	812	404	133	ST GEOR	126	55	55	55	OVERFLOW		FALSE	CREEK	LEFT	200	Glenora	7
20	96-086	316420	343203	826		132	TWEEDSI	134	49	29	49	OVERFLOW/WEIR		FALSE	CREEK	LEFT	200	Glenora	8
21	96-088	255983	343203	839		E132	S103	273	54					FALSE				Glenora	9
25	97-128	255832	343202	820	445	W123	102	46	50	52	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	10
26	97-127	255697	343202	827	456	W122	102	46	50	9	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	11
27	97-126	255840	343202	832	506	W121	102	46	50	78	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	12
28	97-125	255512	343201	805	402	W120	102	46	50	90	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	13
29	97-124	255520	343201	816	411	W119	102	46	50	13	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	14
30	97-123	255525	343201	830	416	W118	102	46	50	12	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	15
31	97-120	255534	343201	843	425	W117	102	46	50	11	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	16
32	97-119	255539	343201	855	431	W116	102	46	50	11	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	17
33	97-118	255562	343201	884	448	W114	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	18
34	97-117	265676	343605	805	805	W113	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	19
35	97-116	265685	343605	817	430	W112	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	20
36	97-115	265684	343605	821	412	112	102	46	50	30	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	21
37	97-114	265754	343605	833	414	111	102	46	50	46	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	22
38	97-113	265728	343605	801	405	114	N101	46	50	7	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	23
39	97-112	245736	343605	803	406	114	S101	46	50	7	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	24
41	97-142	245620	313625	871		W113	99	46	50	10	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	25
46	97-141	245582	313625	839	410	113	S99	46	50	13	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	26
48	97-145	255558	343201	869	440	116	S101	46	54	7	54	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	27
49	97-122	257004	343606	803		114	104	46	50	27	50	LOW PIPE/WEIR		FALSE	RIVER	LEFT	1275	Oliver	28
50	97-109	256913	343210	835	404	W116	106	54	64	64	64	LOW PIPE		FALSE	RIVER	LEFT	3000	Queen Mary Park	29
51	97-108	256922	343210	846	412	W115	106	54	83	64	83	LOW PIPE		FALSE	RIVER	LEFT	3000	Queen Mary Park	30
52	97-107	263239	343617	857		102	111	54	68	14	68	FLOW SPLIT		FALSE	RIVER	LEFT	3000	Spruce Avenue	31
53	96-090	266055	343625			110 ST	N111 AVE	54	55					FALSE				Prince Rupert	32
60	97-129	272723	373220		401	W120	129	31	55	55	55	OVERFLOW		FALSE	RIVER	LEFT	2400	Calder	33
75	97-099	263753	343622		416	W87	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	34
76	97-098	263758	343622		422	W86	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	35
78	97-096	263708	343621		401	W83	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	36
79	97-095	263716	343621		406	W82	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	37
80	97-080	261662	343621		423	W80	113	56	56	56	13	OVERFLOW		FALSE				Cromdale	38
81	97-078	261672	343621		430	W79	113	56	56	56	13	OVERFLOW		FALSE				Cromdale	39
83	97-081	261660	343621		422	W80	114	56	56	56	13	OVERFLOW		FALSE				Edmonton Northlar	40

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
94	96-008	227272	283606	803	412	110	57	22	52	46	52	LOW PIPE		FALSE	RIVER	RIGHT	1500	Pleasantview	**41**
95	96-010	227234	283615		420	111	S61	22	54	54	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Pleasantview	**42**
106		224867	283221		445	112	N76	22	54	47	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	**43**
107	96-007	224927	283221	813	448	112	N75	22	86	48	54	LOW PIPE		FALSE	RIVER	RIGHT	1500	McKernan	**44**
110	97-021	242851	313212	009	471	SASK DR	89	23D	53	48	50	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	375	Windsor Park	**45**
111	97-022	242711	313212	008	443	W120	89	23D	53	49	50	LOW PIPE		FALSE	RIVER	RIGHT	375	Windsor Park	**46**
113	97-029	228112	283625		429	109	73	22	54	14	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	McKernan	**47**
114	96-018	227757	283616	842		109	67	22	51	46	51	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	**48**
116	96-009	227604	283615		406	109	65	22	54	49	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	**49**
119	96-013	227636	283615		431	109	62	22	54	49	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	**50**
120	97-045	227702	283615	842		109	61	22	54	54	54	DUAL		FALSE	RIVER	RIGHT	1500	Pleasantview	**51**
134	97-195	229993	313601	861	473	89	S77	44	55	49	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	**52**
135	96-059	246571	313601	859	471	91	S77	44	55	28	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**53**
139	96-053	229990	313601	828	435	91	S80	44	55	28	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**54**
143	96-064	243161	313610	859		93	S83	116	55	39	55	OVERFLOW/WEIR		FALSE	CREEK	RIGHT	750	Bonnie Doon	**55**
147	96-066	243180	313610	867	437	87	S83	116	50	50	50	LOW PIPE/WEIR		FALSE	CREEK	RIGHT	750	Bonnie Doon	**56**
149	96-051	243858	313601	802	403	89	82	254	52	50	52	LOW PIPE		FALSE	CREEK	RIGHT	1050	Bonnie Doon	**57**
151	97-004	246539	313601	820		89	S81	44	55	46	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	**58**
153	97-003	246506	313601		460	89	S78	44	55	28	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	**59**
154	96-025	229777	283621	804	436	87	76	44	55	49	54	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**60**
155	96-060	246574	313601	864	477	87	S77	44	55	49	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**61**
156	96-058	246570	313601	857		87	77	44	55	49	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**62**
159	97-211	251618	314005		423	85	S80	44	55	55	49	OVERFLOW		FALSE				King Edward Park	**63**
161	97-210	251792	314005		432	85	S79	44	55	55	49	OVERFLOW		FALSE				King Edward Park	**64**
162	97-209	251797	314005		437	85	S78	44	55	55	49	OVERFLOW		FALSE				King Edward Park	**65**
164	97-205	251779	314005	804	408	83	S82	44	55	49	55	OVERFLOW/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	**66**
176	97-001	244348	313621	811	409	87	98	52	52	52	52	OVERFLOW		FALSE	RIVER	RIGHT	900	River Valley Rivers	**67**
177	97-218	244318	313621	809	406	88	98	52	52	52	52	HIGH PIPE		FALSE	RIVER	RIGHT	900	River Valley Rivers	**68**
178	97-217	244347	313621	804	401	92	98	256	52	52	52	OVERFLOW		FALSE	RIVER	RIGHT	500	Cloverdale	**69**
179	97-214	244406	313622	807	420	97	N97	50	69	68	69	OVERFLOW		FALSE	RIVER	RIGHT	1500	Cloverdale	**70**
180 (n/m)	97-161	244671	313617	808	418	103	97	46	50	5	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Rossdale	**71**
181	97-159	245429	313624	869	447	104	S98	46	41	7	41	LOW PIPE		FALSE	RIVER	LEFT	1275	Rossdale	**72**
182 (n/m)	97-158	245174	313617	807	416	104	97	46	50	5	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Downtown	**73**
183 (n/m)	97-157	245040	313617	805		105	97	46	50					FALSE				Rossdale	**74**
184	97-156	245170	313617	806		106	97	46	70					FALSE				Rossdale	**75**
185	97-138	262096	343603	913	442	99	101	243	50	8		LOW PIPE		FALSE	RIVER	LEFT	1980	Downtown	**76**
191	97-002	246377	313613	813		100	SASK DR	188	52	12	52	CHAMBER		FALSE	RIVER	RIGHT	1200	Strathcona	**77**
193	97-014	246787	313608	848	405	102	85	37	79	13	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	**78**
194	97-013	246808	313608	863	406	102	83	37	79	35	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	**79**
195	97-012	246799	313608	876	407	102	84	37	79	35	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	**80**

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
198	97-152a	244681	313617	024	818	105	S96	47	52	23	52	DUAL		FALSE	RIVER	LEFT	1050	Rossdale	**81**
199	97-151	245068	313617	818	502	105	96	47	52	23	52	LOW PIPE		FALSE	RIVER	LEFT	1050	Rossdale	**82**
200	97-146	245204	313613	821	443	101	94	188	52	11	52	LOW PIPE		FALSE	RIVER	RIGHT	1200	Rossdale	**83**
201	97-148	245013	313613	802	416	101	S94	145	52	11	52	OVERFLOW/WEIR		FALSE	RIVER	LEFT	300	Rossdale	**84**
202	97-163	245209	313618	805		100A	97	46	50					FALSE				Rossdale	**85**
204	97-221	245216				E101	96	45	57					FALSE				Rossdale	**86**
220	96-006	242107	313201	807	438	113	L. N. 79	22	54	47	54	LOW PIPE		FALSE	RIVER	RIGHT	1500	Parkallen	**87**
221		227702	283615			109	61	22	54	54	54	OVERFLOW/WEIR		FALSE	RIVER	RIGHT		Pleasantview	**88**
224		243209				89	83	116	56			LOW PIPE		FALSE				Bonnie Doon	**89**
226		245511	313625	801		111	97	46	50	5	50	HIGH PIPE		FALSE	RIVER	LEFT	1275	Oliver	**90**
234		246738	313614			102 (Tommy Banl	Saskatche	37	71					FALSE				Strathcona	**91**
235		262142	343603			100	S. Jasper /	47	26					FALSE				Downtown	**92**
238		246111	313608			101	81	37	79					FALSE				Ritchie	**93**
240 (n/m)		255527				119	S102	46	71					FALSE				Oliver	**94**
244 (n/m)		263246				102	110	54	68					FALSE				Central McDougall	**95**
245 (n/m)		263247				102	110	54	68					FALSE				Central McDougall	**96**
249		242945	313218			Hawrelak Park		27	66					FALSE				Hawrelak Park	**97**
250 (03,n/m)		255647				W114	N101	46	88					FALSE				Oliver	**98**
254 (03,n/m)		245584				112	98	46	50					FALSE				Oliver	**99**
255 (03)		245344				104	98	46	50					FALSE				Downtown	**100**
258 (03)		247763	313614			103	Sask. Dr	37	71					FALSE				River Valley Walter	**101**
265 (06, n/m)		240896				137	82	21	65			DUAL		FALSE				Laurier Heights	**102**
266 (08)		244346	313621	814	401	92	S98	256	46	46	46	LOW PIPE		FALSE	RIVER	RIGHT	500	Cloverdale	**103**
267 (09)		243667				92	98	256						FALSE	RIVER	RIGHT		Cloverdale	**104**
268 (09)		244163				Mill Creek		44						FALSE				Mill Creek Ravine N	**105**
269 (13, n/m)		261579				78	111	203				LOW PIPE		FALSE				River Valley Kinnai	**106**
273		330340				122	39A	2				DUAL		FALSE	Whitemud	RIGHT		Aspen Gardens	**107**
274		258480				123	112	31				LOW PIPE		FALSE				Inglewood	**108**
275		282732				37	122	88				LOW PIPE		FALSE				Beacon Heights/Be	**109**
276 (19)		243786	9343602			96A	98	51				TRANSVERSE WEIR		FALSE				Cloverdale	**110**
277 (19)		231393				111A	50	2				Dual MH with WEIR		FALSE	Whitemud	RIGHT		Malmo Plains	**111**
278 (19)		287019				W71	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**112**
279 (19)		287020				W70	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**113**
280 (19)		287021				W69	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**114**
281 (19)		286503				W70	129	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**115**
282 (19)		286554				W69	129	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**116**
283 (19)		286508				70	N127	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	**117**

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
CLOSED INTERCONNECTIONS																			
			344416	809		E34	N102	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	1
			344416	808		35	102	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	2
			344416	807		36	102	71	66	66	66	COMMON	######	TRUE	RIVER	LEFT	1200	Rundle Heights	3
			344020		411	37	103	71	66	66	66	COMMON	######	TRUE	RIVER	LEFT	1200	Rundle Heights	4
			344416	803		E34	103	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	5
			374011	011	420	W38	123	88	80	80	80	HIGH PIPE	######	TRUE	CREEK	LEFT	1350	Bergman	6
			374414	PW		HOOKE RD	HERMITA	74	64	64	64	PUMPWELL		TRUE	RIVER	LEFT	7620	Canon Ridge	7
			344023	869		55	S ADA BL	62	65	65	65	OVERFLOW	######	TRUE	RIVER	LEFT	1200	River Valley Highla	8
			343621		417	W81	114		56	56	13	OVERFLOW		TRUE					9
			343602	832		94	CAMERO	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	10
			343602	831		W94	CAMERO	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	11
			343602	830		E95	CAMERO	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	12
			343602	829		E95	CAMERO	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	13
			343610	804	404	88	102	53	52	50	52	LOW PIPE	######	TRUE	RIVER	LEFT	675	Riverdale	14
			343610	810	405	87	102	53	67	52	67	LOW PIPE	######	TRUE	RIVER	LEFT	675	Riverdale	15
			343609	868	411	89	ROWLAN	152	43	11	42	LOW PIPE	######	TRUE	RIVER	LEFT	450	Riverdale	16
			343609	874		88	104	155B	24	10	24	LOW PIPE	######	TRUE	RIVER	LEFT	600	Riverdale	17
			343609	873		88	104	155A	24	10	24	HIGH PIPE	######	TRUE	RIVER	LEFT	600	Riverdale	18
			343602	858	435	94	ROWLAN	148	42	11	42	LOW PIPE	######	TRUE	RIVER	LEFT	450	River Valley Kinnai	19
			373602	835	411	89	117	56	14	14	14	CHAMBER	######	TRUE	RIVER	LEFT	1950	Parkdale	20
			373601		429	N RACE TRK	NORTHLA	56	64	64	64	OVERFLOW	######	TRUE	RIVER	LEFT	1950	Edmonton Northlar	21
			373601		411	E80	S116	56	57	57	57	OVERFLOW CH	######	TRUE	RIVER	LEFT	1950	Edmonton Northlar	22
			373619	802		86	127	74	58	58	58	DROP MANHOLE	######	TRUE	RIVER	LEFT	7620	Killarney	23
			373919	410		90	127	74	58	58	58	LOW PIPE TEE	######	TRUE	RIVER	LEFT	7620		24
			373601	870	411	E80	116	56	57	57	57	CHAMBER	######	TRUE	RIVER	LEFT	1950	Parkdale	25
			343617	835		105	KINGSWA	54	68	68			######	TRUE	RIVER	LEFT	3000	Central McDougall	26
			343211		418	116	107	54	72	72	72	MEMBRANE HOI	######	TRUE	RIVER	LEFT	3000	Queen Mary Park	27
			343605	811		113	102	46	50	30	50	OVERFLOW	######	TRUE	RIVER	LEFT	1275	Oliver	28
			343201	874	441	W115	102	46	50	8	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Oliver	29
			343605	001	T1	114	N103	46	64	64	50	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1275	Oliver	30
			343223	007		E133	S116	31	54	54	54	COMMON		TRUE	RIVER	LEFT	2400	Woodcroft	31
			373215	802		143	N YELLOV	30	61	61	61	COMMON		TRUE	RIVER	LEFT	1650	Brown Industrial	32
			373224	007		ST ALBERT	130	31	66	66	66	COMMON		TRUE	RIVER	LEFT	2400	Bonadventure Indu	33
			373215	801		149	SYELLOW	31	63	63	63	COMMON		TRUE	RIVER	LEFT	2400	Brown Industrial	34
			373219		427	W124	129	31	55	55	55	OVERFLOW	######	TRUE	RIVER	LEFT	2400	Calder	35
			373219		417	W126	129	31	55	55	55	OVERFLOW	######	TRUE	RIVER	LEFT	2400	Calder	36
			433202	PW		E DUNLUCE	161	75	78	78	78	PUMPWELL	######	TRUE	RIVER	LEFT	2250	Calder	37
			343603	854	417	100	101	48	26	5	26	LOW PIPE	######	TRUE	RIVER	LEFT	1500	Downtown	38
			343602	049		96	GRIERSO	49	62	62	62	OVERFLOW CH	######	TRUE	RIVER	LEFT	1200	Downtown	39

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			343603	862		100	101	48	70	66	50	OVERFLOW	######	TRUE	RIVER	LEFT	1500	Downtown	40
			313613	PW		101	S94	145	52	11	52	PUMPWELL	######	TRUE	RIVER	LEFT	300	Rossdale	41
			313618	821	443	101	94	145	52	11	52	LOW PIPE	######	TRUE	RIVER	LEFT	300	Rossdale	42
			313618	836	OF	E100	95	241	57	57	57	OVERFLOW		TRUE	RIVER	LEFT	375	Rossdale	43
			313617	007	479	106	95	42	85	85	58	LOW PIPE	######	TRUE	RIVER	LEFT	600	Downtown	44
			313617	504		103	96	47	52	33	52	OVERFLOW	######	TRUE	RIVER	LEFT	1050	Rossdale	45
			313616	803	402	110	97	46	50	15	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Oliver	46
			313617	805	414	106	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Downtown	47
			313617	806	415	105	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Downtown	48
			313624	905	417	BELLAMY H	N97	46	50	50	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	49
			313617	838	419	102	97	46	50	5	50	LOW PIPE		TRUE	RIVER	LEFT	1275	Rossdale	50
			313618	802	402	101	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	51
			313618	805	405	100A	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	52
			313618	806	OF	100	97	45	50	5	50	OVERFLOW/WE	######	TRUE	RIVER	LEFT	600	Rossdale	53
			313625	843		112	98	46	50	5	50	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1275	Downtown	54
			313623	827		W100	99	109	7	5	7	LOW PIPE TEE	######	TRUE	RIVER	RIGHT	500	Rossdale	55
			313623	828	511	100	99	109	7	5	7	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Rossdale	56
			313623	828	511	100	99	109	7	7	7	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Rossdale	57
			313623	831	OF	SW LOW LVL	BRIDGE	48	29	5	29	HOLE		TRUE	RIVER	LEFT	1500	Rossdale	58
			313617	873	417	BELLAMY RD	97	46	62	62	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	59
			313623	819	497	E100	MCDONAL	48	57	10	29	LOW PIPE		TRUE	RIVER	LEFT	1500	Downtown	60
			343214	801		137	N108	31	53	53	53	DUAL		TRUE	RIVER	LEFT	2400	North Glenora	61
			343213	4		133	N109A	31	52	52	52	HIGH PIPE		TRUE					62
			343218	819		133	N110A	31	52	52	52	LOW PIPE		TRUE					63
			343214	29		139	N107A	31	52	52	52	LOW PIPE		TRUE					64
			343214	56		135	N107A	31	52	52	52	LOW PIPE		TRUE					65
			343213	18		133	107A	31	52	52	52	LOW PIPE		TRUE					66
			343208	826		E132	STONY PLAIN RD		48	48	15			TRUE					67
			343202	17		125	SJASPER	46	34			PUMPWELL	######	TRUE					68
			313224	811		W139	RAVINE D	30	61	55	61	OVERFLOW		TRUE	RIVER	LEFT	1650	River Valley Capito	69
			313223	PW		ST GEORGE	VICTORIA	123	64	29	55	PUMPWELL	######	TRUE	CREEK	LEFT	200	Glenora	70
			343203	SOF		W132	TWEEDSN	135	50	50	50	OUTFALL		TRUE	CREEK	LEFT	100	Glenora	71
			343203	839		E132	S103	125	54	54		DUAL	######	TRUE	CREEK	LEFT	200	Glenora	72
			343204	841		139	101		65	65	51		######	TRUE					73
			342823	PW		163	116	18	75	74	75	PUMPWELL	######	TRUE	RIVER	LEFT	2400	Norwester Industria	74
			372810	PW		154	123	18	80	80	80	PUMPWELL	######	TRUE	RIVER	LEFT	2400	Mitchell Industrial	75
			342807	014		170	105	18	75	75	75	OVERFLOW	######	TRUE	RIVER	LEFT	2400	McNamara Industri	76
			312820	PW		151	N94	29	58			PUMPWELL	######	TRUE	RIVER	LEFT	1650	Sherwood	77
			282819	PW		WOLF WIL R	WOLF WI	13	75	75	75	PUMPWELL	######	TRUE	RIVER	LEFT	1950	Westridge	78
			252420	PW		E WEDGEWOO	WEAVER	257	88			PUMPWELL	######	TRUE	CREEK	LEFT	900	Wedgewood Heigh	79
			313204	075		BV RD	81	21	59	57	58	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1350	Laurier Heights	80
			313204	PW		BV RD	VAL VIEW	21	58	57	58	PUMPWELL	######	TRUE	RIVER	LEFT	1350	Parkview	81

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			313204	803		N BV RD	VAL VIEW	21	60	60	60	COMMON	######	TRUE	RIVER	LEFT	1350	Parkview	82
			313207	085		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	83
			313207	511		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	84
			313207	087		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	85
			313208	003		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	86
			313208	002		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	87
			313208	001		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	88
			313207	088		E136	VAL VIEW	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	89
			313204	077		VAL VIEW C	86	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	90
			313204	076		VAL VIEW C	86	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	91
			344018		414	W65A	109	65	57	56	57	FLOW SPLIT		TRUE	RIVER	RIGHT	900	Capilano	92
			344007	850		W FULTON D	106	58	59	59	59	DROP MANHOLE	######	TRUE	RIVER	RIGHT	1350	Fulton Place	93
			344007	467		E CAPILANO	106	58	59	59	59	CHAMBER	######	TRUE	RIVER	RIGHT	1350	Capilano	94
			313601	858		85	82	254	52	49	52		######	TRUE	CREEK	RIGHT	1050	Bonnie Doon	95
			313622	819	408	96A	98	51	60	26	60	OVERFLOW/WE	######	TRUE	RIVER	RIGHT	600	Cloverdale	96
			313621	802	401	92	98	256	59	46	59	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Cloverdale	97
			313602	848		W94	S81	254	83	58	83	DROP MANHOLE	######	TRUE	CREEK	RIGHT	1050	Mill Creek Ravine	98
			283620		436	91	70	92B	54		61	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	99
			283620		457	90	70	192	54			OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	300	Mill Creek Ravine	100
			283621		415	91	72	191	54		54	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	525	Mill Creek Ravine	101
		229761?	283621		450	W87	73	93	56		56	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	675	Mill Creek Ravine	102
			283620		420	91	66	91	54	54	54	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	103
			283611		419	92	63	194	54	54		OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	104
			283611		423	91	63	193	61		54	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	300	Mill Creek Ravine	105
		229112?	283611		416	90	65	91B	54	54		OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	600	Mill Creek Ravine	106
		229130?	283611		433	90	65	91A	54	54	54	OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	900	Mill Creek Ravine	107
			283621		413	W93	67	195	54			OUTFALL - NEVER WAS		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	108
			283610	004	403	92	60	90	68	68	68	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Coronet Industrial	109
			283610		403	92	60	90	68	68	68	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Coronet Industrial	110
			313609	867	TUN	92	84	116	55	30	55	OUTFALL	######	TRUE	CREEK	RIGHT	750	Mill Creek Ravine	111
			313614	835	463	N QE RD		39	55	55	55	LOW PIPE	######	TRUE	RIVER	RIGHT	600	River Valley Walter	112
			313614	PW		E104	N SASK D	37	56	56	51	PUMPWELL	######	TRUE	RIVER	RIGHT	900	River Valley Walter	113
			313614	PW		E104	N SASK D	37	56	56	51	PUMPWELL	######	TRUE	RIVER	RIGHT	900	River Valley Walter	114
			313614	003		102	SASK RIV	38	56	56	56	CHECK VALVE	######	TRUE	RIVER	RIGHT	750	River Valley Walter	115
			313613	424		LAVIGNE RD	91	188	88	90				TRUE	RIVER	RIGHT	1200	River Valley Walter	116
			313219	PW		118	SASK DR	32	53	53	53	PUMPWELL	######	TRUE	RIVER	RIGHT	1200	Windsor Park	117
			313219		446	116	N SASK D	32	55	40	55	LOW PIPE TEE	######	TRUE	RIVER	RIGHT	1200	Windsor Park	118
			283619	803	403	97	S71	92B	60	50	60	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Hazeldean	119
			283625	840	428	E111	73	22	54	48	54	LOW PIPE/WEIR	######	TRUE	RIVER	RIGHT	1500	McKernan	120
			283221	818		112	74	22	54	49	54	OVERFLOW	######	TRUE	RIVER	RIGHT	1500	McKernan	121
			283221	808		112	N76	22	47	47	47	OVERFLOW	######	TRUE	RIVER	RIGHT	1500	McKernan	122
			283219	801		BELGRAVIA	N68	22	59	59	59	COMMON	######	TRUE	RIVER	RIGHT	1500	Lendrum Place	123

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			253221	038		113A	46	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	124
			253221	502		112	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	125
			253221	040		111A	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	126
			253221	505		111A	N46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	127
			253221	022		111A	S48	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	128
			253625		496	111A	N48	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	129
			253221	806		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	130
			253221	807		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	131
			253221	808		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	132
			253221	504		113A	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	133
			253212	051		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	134
			253212	489		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	135
			253212	053		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	136
			253219	808		ASPEN DR	40	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Aspen Gardens	137
			253219	055		ASPEN DR	N40	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	138
			253219	056		ASPEN DR	N40	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	139
			253219	054		ASPEN DR	S41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	140
			253219	053		ASPEN DR	S41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	141
			253219		480	ASPEN DR	41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	142
			253219	052		ASPEN DR	N41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	143
			253219	057		ASPEN DR	N41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	144
			253202		466	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	145
			253202		465	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	146
			253202		468	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	147
			253202		464	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	148
			253202		467	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	149
			253203	018		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	150
			253203		424	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	151
			253203	022		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	152
			253203	021		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	153
			253203	020		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	154
			253203	019		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	155
			253203		423	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	156
			253208	019		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	157
			253208		417	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	158
			253208		416	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	159
			253208	016		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	160
			253208	015		WESTBRK		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	161
			253208		413	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	162
			253208	013		WESTBRK	FAIRWAY	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	163
			253208	012		WESTBRK	W FAIRW	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	164

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
			253208		410	WESTBRK	W FAIRW	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	165
			253208	010		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	166
			253208	001	401	WESTBRK	MARLBOF	1	64	64	61	HIGH PIPE	######	TRUE	CREEK	RIGHT	900	Westbrook Estate	167
			253213		422	MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	168
			253214	006		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	169
			253214	005		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	170
			253214	004		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	171
			253213	038		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	172
			282810	002	403	E WHITEMUD	58	12	74	71	72	HIGH PIPE	######	TRUE	RIVER	RIGHT	750	River Valley Whiter	173
			282811	011	405	FORT EDM		14	70	70	70	PUMPWELL	######	TRUE	RIVER	RIGHT	1050	River Valley Whiter	174
			252819	PW		RODNEY CR		101	80			PUMPWELL	######	TRUE	RIVER	RIGHT	1500	Rhatigan Ridge	175
			253613	801		101	N39	9	75	75	66	COMMON	######	TRUE	RIVER	RIGHT	5100	Strathcona Industri	176
			253618	801		101	S41	9	66	66	66	COMMON	######	TRUE	RIVER	RIGHT	5100	Strathcona Industri	177
			253602	012		W97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	178
			253602	013		97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	179
			253602	014		E97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	180
			253603		445		30	9	71			MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	181
			253203		412	E125	29A	9	78	78	78		######	TRUE	RIVER	RIGHT	5100	Blue Quill Estates	182
						E101	96		57				######	TRUE					183
						100	90		52					TRUE					184
							n. Borden Park		56					TRUE					185
146 (98)	97-207	243102	313610	856	438	87	S84	116	56	56	56	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	750	Bonnie Doon	186
160 (98)	96-054	246554	313601	836	424	85	79	44	55	49	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	187
152 (98)	96-048	246559	313601	842	447	89	S79	44	55	53	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	188
222 (98)		246649	313602	876		94	81	254	55	22	55	OVERFLOW		TRUE	CREEK	RIGHT	1050	Mill Creek Ravine	189
137 (99)	96-056	246564	313601	850	457	91	S78	44	55	28	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	190
138 (99)	96-055	246552	313601	840	445	91	S79	44	55	53	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	191
145 (99)	96-063	243986	313610	852		93	S84	116	55	30	50	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	750	Bonnie Doon	192
231 (99)		255784	343209			127	Villa Ave		88					TRUE					193
232 (99)		278099	403604			101	132		54					TRUE					194
233 (99)		293599	403604			101	134		54					TRUE					195
127 (00)	96-022	229524	283619	809		95	S71	92B	60	50	60	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	196
126 (00)	96-024	229513	283619	817		95	S70	92B	60	50	60	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	197
142 (00)	96-061	243861	313602	883	431	94	82	245	52	50	52	LOW PIPE		TRUE	RIVER	RIGHT	225	Mill Creek Ravine	198
23 (01)	96-089	256682	343208	826		132	S. Stony P	129	50	28	50	FLOW SPLIT		TRUE	CREEK	LEFT	250	Glenora	199
115 (01)	96-017	227606	283616		437	109	66	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	200
123 (01)	96-020	229418	283618	815		98	L..S. 71	92B	61	50	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	201
129 (01)	96-031	229911	283621	856	448	95	72	191	54	50	54	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	525	Hazeldean	202
197 (01)	97-020	247820		820	504	Walterdale Rd.	Queen Elizabeth Hill		52					TRUE				River Valley Walter	203
112 (02)	97-024	242968	313219	006		118	EDINBOR	32	53	53	53	LOW PIPE		TRUE	RIVER	RIGHT	1200	Windsor Park	204
237 (02)		242084	313201			113	N78		54					TRUE					205
2 (02)	97-051	209501	253208	801		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	206

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3 (02)	97-052	209500	253207	802		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**207**
4 (02)	97-053	209498	253207	801		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**208**
5 (02)	97-055	209510	253208	804		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**209**
6 (02)	97-056	209548	253208	803		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**210**
7 (02)	97-057	209545	253208	802		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**211**
8 (02)	97-058	303873	253213	801		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	**212**
133 (02)	96-026	229869	283622	806	409	95	76	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	**213**
196 (02)	97-224	247806	313614	006		E104	N SASK D	38	56	56	51	DUAL		TRUE	RIVER	RIGHT	750	River Valley Walter	**214**
10 (03)	97-179	240041	313207	013		142	BUENA VI	24	58	57	58	HIGH PIPE		TRUE	RIVER	LEFT	1500	Parkview	**215**
22 (03)	96-087	255979	343203	836		E132	N103	130	54	54	54	DUAL		TRUE	CREEK	LEFT	300	Glenora	**216**
24 (03)	97-171	255675	343202	16		125	SJASPER	46	34			LOW PIPE		TRUE					**217**
55 (03)	97-136	272597	373219		421	W125	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	**218**
56 (03)	97-133	272607	373219		433	W123A	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	**219**
58 (03)	97-131	272633	373219		449	W122	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	**220**
77 (03)	97-097	263772	343622		433	W84	114		56	56	13	OVERFLOW		TRUE					**221**
82 (03)	97-079	261664	343621		429	W79	114		56	56	13	OVERFLOW		TRUE					**222**
91 (03)	97-194	268186	344011	801	412	43	106B	105	58	58	58	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	1500	Gold Bar	**223**
92 (03)	97-193	268200	344011	802		E42	106B	105	58	58	58	DUAL		TRUE	RIVER	RIGHT	1500	Gold Bar	**224**
93 (03)	97-069	231340	253624	005	405	106	N47	2	63	61	63	LOW PIPE		TRUE	CREEK	RIGHT	2100	Empire Park	**225**
40 (03)	97-143	239392	313625	816	402	114	100	46	50	7	50	LOW PIPE		TRUE	RIVER	LEFT	1275	Oliver	**226**
229 (03)		270363	344005				n. Borden Park		56					TRUE					**227**
257 (03)		245306				100	McDonald		57					TRUE				Downtown	**228**
260 (03)		240920				Buena Vista Rd	81		58					TRUE					**229**
84 (05)	97-225	270533		207533		W72	113		57					TRUE					**230**
96 (05)	97-030	227748	283616		425	110	N66	22	54	50	54	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	1500	Parkallen	**231**
97 (05)	96-015	227670	283616		415	111	L. S. 67	22	54	50	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	**232**
100 (05)	96-034	228096	283625		415	111	72	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**233**
101 (05)	96-036	228103	283625		421	111	73	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**234**
102 (05)	97-033	228099	283625		420	111	74	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**235**
103 (05)	97-034	228154	283625		407	111	75	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**236**
104 (05)	97-035	228082	283625		426	111	76	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**237**
261 (05)		238144				151	95		58					TRUE					**238**
130 (07)	96-029	229891	283622	829	470	95	73	100	55	47	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	**239**
166 (07)	97-199	251790	314005	817	430	81	S80	44	55	49	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**240**
105 (07)	96-038	228152	283625	802	401	111	N76	22	54	47	54	LOW PIPE		TRUE	RIVER	RIGHT	1500	McKernan	**241**
108 (07)	96-004	224871	283221		451	112	N73	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**242**
109 (07)	96-005	224875	283221		454	112	N72	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	**243**
236 (07)		242092	313201			112	S78		86			OVERFLOW		TRUE				Parkallen	**244**
263 (07)		278090				105	130		59					TRUE				Lauderdale	**245**
121 (07)	96-019	229419	283618	816		99	70	92B	61	50	61	DUAL		TRUE	CREEK	RIGHT	750	Hazeldean	**246**
54 (07)	97-180	254704	342821	025	410	156	116	18	75	58	75	LOW PIPE/WEIR		TRUE	RIVER	LEFT	2400	Alberta Park Indust	**247**
264 (05, n/m)		278091				105	130		59					TRUE				Lauderdale	**248**
206 (09)	97-213	243177	313610	866		W87	S83		49			LOW PIPE		TRUE				Bonnie Doon	**249**

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168 (03)	97-197	252003	314005	828	438	81	S78	44	55	49	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**250**
174 (03)	97-203	251466	314004	816	412	77	S81	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**251**
158 (10)	97-212	251782	314005		416	85	S81		55	55	49	OVERFLOW		TRUE					**252**
47 (10)	97-144	239410	313221	815		115	100	46	54	30	54	OVERFLOW		TRUE	RIVER	LEFT	1275	Oliver	**253**
122 (10)	97-027	229960	283623	833		98	S72	92B	61	49	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	**254**
125 (10)	96-023	229520	283619	806	402	96	S71	92B	60	50	60	LOW PIPE		TRUE	CREEK	RIGHT	750	Hazeldean	**255**
131 (10)	96-028	229883	283622	821	426	95	74	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	**256**
132 (10)	96-027	229875	283622	812	420	95	75	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	**257**
124 (n/m) (10)	97-028	229422	283618	819		98	S70	92B	61	50	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	**258**
165 (11)	97-200	251786	314005	813	459	81	S81	44	55	50	55	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**259**
171 (11)	96-075	251791	314005	818	431	79	S80	44	56	50	56	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**260**
172 (11)	97-201	251787	314005	813	422	79	S81	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**261**
230 (n/m) (12)		270510	344005				n. Borden Park		56					TRUE				Edmonton Northlar	**262**
243 (n/m) (12)		263242				102	111		68					TRUE				Central McDougall	**263**
167 (12)	97-198	251795	314005	824	435	81	S79	44	55	49	55	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**264**
169 (12)	97-196	231975	314005	832	443	81	S77	44	55	52	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**265**
170 (12)	96-078	251796	314005	826	436	79	S79	44	56	49	56	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**266**
173 (12)	97-204	251711	314004	808	404	77	S82	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**267**
175 (12)	97-202	251758	314004	826	415	77	S80	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	**268**
128 (13) OF 2010-103	96-030	229914	283622	855	457	95	71	92B	60	50	60	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	750	Hazeldean	**269**
272 (50) RPN 0016		255496				W115	102							TRUE				Oliver	**270**
157	96-045	246533	313601	815	421	87	81	44	55	49	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	**271**
140 (16) OF 2011-23	96-046	246491	313601	818	425	91	S81	44	55	22	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**272**
262 (05, closed '16)		255832				W123	102	46	47					TRUE				Oliver	**273**
259 (03, closed '16)		270391				73	N112	56	56					TRUE				Virginia Park	**274**
57 (18)	97-132	272618	373219		440	W123	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	**275**
59 (18)	97-130	272636	373219		452	W121	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	**276**
136 (18)	96-057	229992	313601	856	464	91	77	44	55	28	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**277**
141 (18)	97-005	246486	313601	806	415	91	S82	44	55	31	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	**278**
150 (18)	96-044	246489	313601	809		89	S82	44	55	46	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	**279**
98 (19)	96-002	224786	283220	807	418	112A	67	22	54	54	54	LOW PIPE		TRUE	RIVER	RIGHT	1500	Parkallen	**280**
99 (19)	96-001	224790	283220	811	421	112	67	22	51	51	51	LOW PIPE		TRUE	RIVER	RIGHT	1500	Parkallen	**281**
117 (19)	96-011	227631	283615		428	109	64	22	54	50	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	**282**
118 (19)	96-012	227633	283615		429	109	63	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	**283**
144 (19)	96-062	243904	313609	869	870	W93	L. S. 84	116	55	30	55	LOW PIPE		TRUE	CREEK	RIGHT	750	Bonnie Doon	**284**
163 (19)	97-208	231913	314005		442	85	S77	44	55	55	49	OVERFLOW		TRUE				King Edward Park	**285**
223		246523	313601	814		93	81	22	55			LOW PIPE		TRUE				Bonnie Doon	**286**

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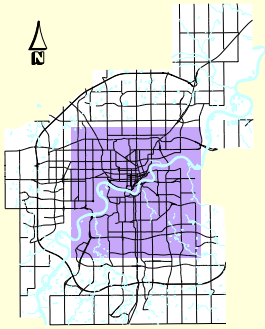
Removed from database (emergency pump overflow)																			
1 (02)	97-070	208392	253203	007	412	125	29A	1	76			LOW PIPE			CREEK	RIGHT	900	Blue Quill Estates	
9 (02)	97-059	223283	282810	PW	403	E WHITEMUD	58	12	72	70	72	PUMPWELL			RIVER	RIGHT	750	River Valley Whitemud	
11 (02)	97-187	223504	283223	006		S133	BV RD	21	58	59	58	DUAL			RIVER	LEFT	1350	Laurier Heights	
87 (02)	97-072	270916	344416	053	469	29	102	71	66	66	66	OVERFLOW			RIVER	LEFT	1200	Rundle Heights	
Removed from database (does not exist)																			
227 (03)		256917	343211		407	116	106	54	72	72	72	DROP MANHOLE STRUCTURE			RIVER	LEFT	3000	Queen Mary Park	
228 (03)		241889	343205		436	145	SUMMIT D	30	50						RIVER	LEFT	1650	Crestwood	
239 (03)		246519				89	S77												
241 (03)		265734				113	102												
242 (03)		265734				113	102												
85 (04)	97-226	270523		270523		E71	113		51										
86 (04)	97-227	270376		270376		E71	113		51										
203 (04)	97-170	244717	313618	806	407	100	97	45	50	5	50	LOW PIPE			RIVER	LEFT	600	Rossdale	
205 (04)	97-220	321318				E101	96		85										
225 (n/m) (04)		245210	313623			100	97		50										
248 (n/m) (04)		266011				W109	111		68										
256 (03,n/m) (04)		262720				96	103		49										
Removed from database (discharge back to combined system)																			
186 (04)	97-082	262009	343609	815	814	95	101	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
187 (04)	97-083	262749	343609	810	402	95	102A	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
188 (04)	97-084	262747	343609	809	401	95	103	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
246 (n/m) (04)		262534				W105	106		69										
247 (n/m) (04)		262495				W106	106		69										
192 (n/m) (10)	97-015	246867	313613	843	412	100	89	188	53	53	53	LOW PIPE/WEIR			RIVER	RIGHT	1200	River Valley Walterdale	
270 (13)		270548				60E	112											Highlands	
271 (13)		284287				57E	112											Highlands	

Notes:
(n/m) = not monitored
(xx) indicates the year of discovery or closure of the I/C (if known)

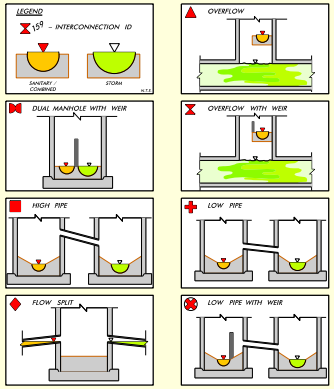
INTERCONNECTION CONTROL STRATEGY

2021 STATUS & DWO LOCATIONS



LOCATION PLAN
(NOT TO SCALE)

INTERCONNECTION (I/C) TYPES



OTHER TYPES

- CHAMBER
- PUMPWELL / CHAMBER
- CSO
- NON-DEFINED OPEN
- RAINGAUGE
- FLOW MONITOR
- RTC - REAL TIME CONTROL STRUCTURE
- 1200 - PIPE SIZE AND FLOW DIRECTION
- NON-DEFINED CLOSED

INTERCONNECTION ACTIVITY CLASSIFICATION

- DRY WEATHER OVERFLOW (DWO)
- MONITORED CELLULAR INTERCONNECTION
- PLANNED LOGGER UPDATE
- IC CLOSURE
- IC COVERED BY OTHER INSPECTIONS
- IC AFFECTED BY LRT CONSTRUCTION

EPCOR PROVIDING MORE

SITE AND MANHOLE IDs CROSS REFERENCE

IC21SUM.dgn 2/15/2022 3:14:00 PM EPCOR provides no warranty for any inaccuracies in the information provided

DMA : IC21SUM.DGN FEB. 2021

Storm and CSO Volumes and Loadings

This section is submitted in compliance with Section 4.4.10 and 6.3.3 of the Approval No. 639-03-06 for the one year period ending December 31, 2021. The monthly volumes discharged to the North Saskatchewan River (NSR) are indicated on the attached plot (Figure 1 and 2) for the following locations:

- 30 Avenue Storm Outfall
- Groat Road Storm Outfall
- Quesnell Storm Outfall
- Kennedale Storm Outfall
- Rat Creek CSO
- Highlands CSO
- Capilano CSO
- Cromdale CSO
- Strathearn CSO

Estimated and measured storms volumes are indicated on Figure 3. Total monitored CSO volumes are indicated on Figure 4. A tabular summary of the flow volumes and estimations of total monthly volumes discharged is also attached (Table 2). Of the sites reported, the storm and combined system contribute 99.9% and 0.1% of the volume, respectively.

The total (measured and estimated) flow volume discharged from the storm sewer system to the NSR in 2021 was 96.0 million m^3 - an 88.2% decrease compared to the 2020 volume of 180.6 million m^3. This large decrease is the result of a wet year in 2020 and a dry year in 2021. The 2021 flow volumes from the 30th Avenue, Groat Road, Quesnell, and Kennedale storm outfalls were 4.6, 2.4, 10.8, and 9.1 million m^3, respectively. The volume of flows from Mill Creek originating inside the City limits was 11.1 million m^3.

For the combined sewer system, the total CSO flow volume discharged to the NSR in 2021 was 54,560 m^3 - an 872.6% decrease compared to the 2020 volume of 530,677 m^3. Again, this large decrease is the result of a wet year in 2020 and a dry year in 2021. The 2021 flow volumes from the Rat Creek, Highlands, Capilano, Cromdale, and Strathearn CSOs, were 32,152; 19,378; 21; 9; and 0 m^3, respectively.

Water quality samples were obtained for the majority of the significant discharge events during the year. As well, a total of 83 dry-weather (baseflow) water quality samples were obtained from the storm sewer system. Table 3 provides a tabular summary of calculated flow-weighted mean monthly and annual concentrations for different constituents and the number of events sampled for water quality analysis.

In accordance with our Approval requirements, total monthly loadings to the North Saskatchewan River have been calculated for the above sites. Summaries of measured loads and estimated total loads for the City of Edmonton's storm and combined sewer system are included in Table 4. The reported loads were calculated using daily constituent concentrations, including storm sewer baseflow data, and the measured or estimated flow volumes. The combined storm and CSO total loading to the NSR consists of about 9,103 tonnes of total suspended solids (TSS), 1,015 tonnes of biochemical oxygen demand (BOD), 32 tonnes of total phosphorous (TP), 107 tonnes of nitrite and nitrate (NO_2 + NO_3), 42 tonnes of ammonia (NH_3), and 191 tonnes of total Kjeldahl nitrogen (TKN). Summaries of the Rat Creek CSO concentration statistics are shown in Table 5.

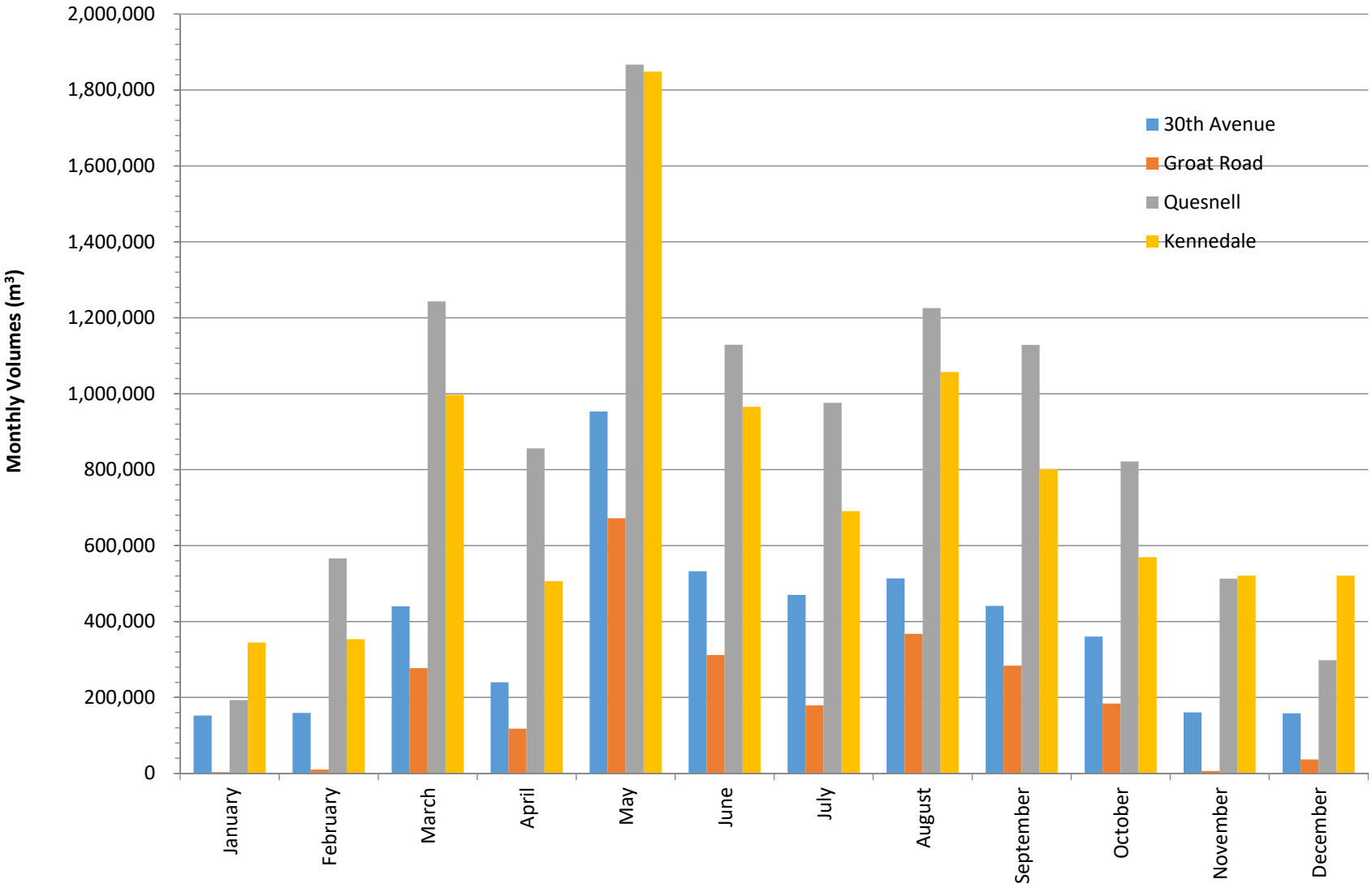


Figure 1: Total (Measured + Estimated) Storm Volume in 2021

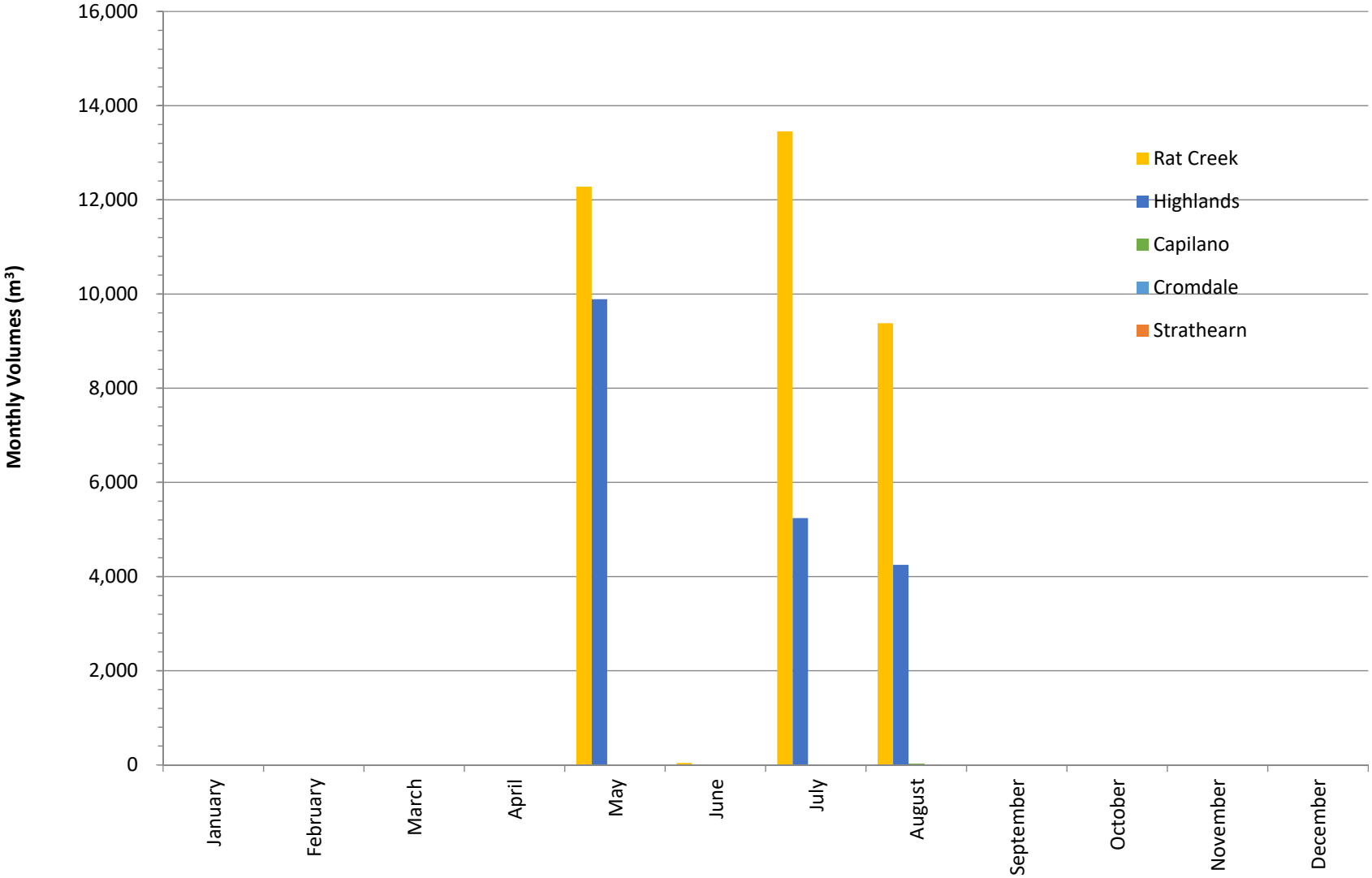


Figure 2: Total (Measured + Estimated) CSO Volumes in 2021

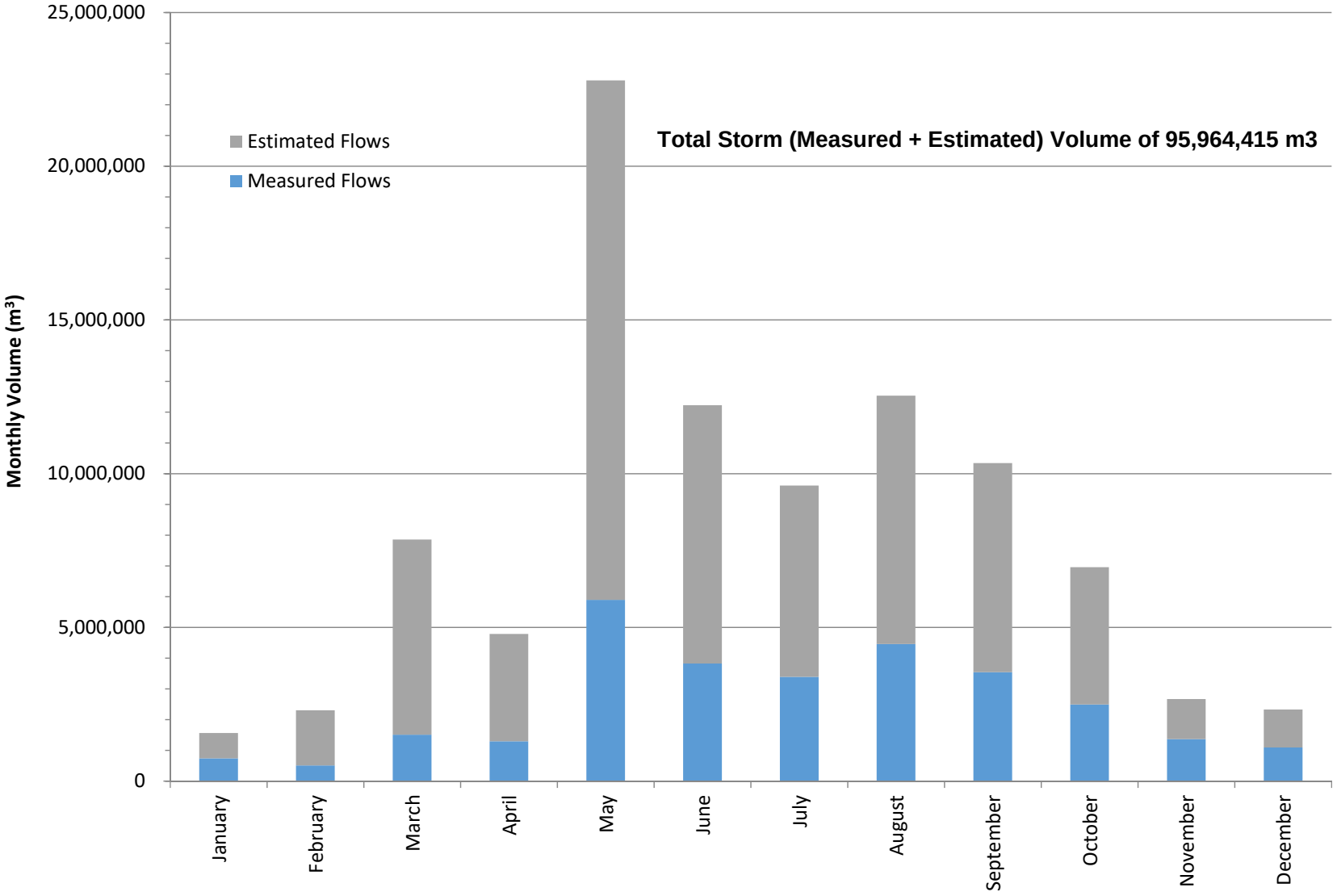


Figure 3: Total Storm (Measured + Unmonitored) Volumes in 2021 (All Storm Outfalls and Creeks)

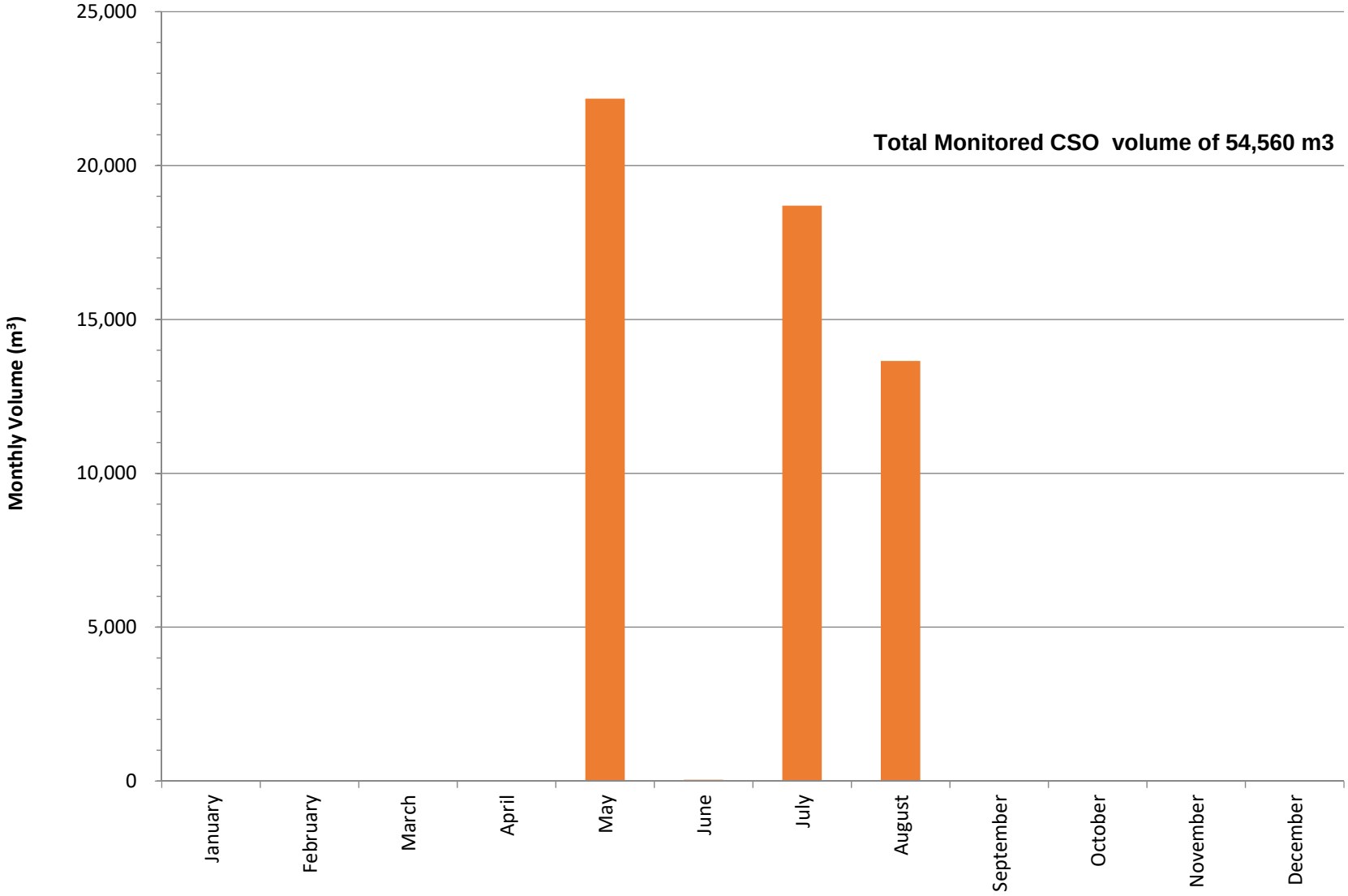


Figure 4: Total Monitored CSO Volume in 2021

Table 2: 2021 Annual Discharge Volumes (in Cubic Meters)

	Storm Outfalls				CSO Outfalls				
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Cromdale**	**Strathearn**
January	152,229	3,081	192,913	344,600	0	0	0	0	0
February	159,255	9,950	566,111	353,225	0	0	0	0	0
March	439,956	277,268	1,243,223	996,832	0	0	0	0	0
April	239,703	117,707	855,979	505,902	0	0	0	0	0
May	952,923	671,726	1,866,701	1,848,358	12,278	9,889	0	9	0
June	532,203	311,812	1,128,744	965,283	38	0	0	0	0
July	470,033	178,854	976,037	690,587	13,453	5,241	0	0	0
August	513,557	367,484	1,225,215	1,057,120	9,379	4,248	21	0	0
September	440,853	283,579	1,128,512	801,537	5	0	0	0	0
October	360,232	183,662	821,377	569,162	0	0	0	0	0
November	160,495	6,337	512,797	520,755	0	0	0	0	0
December	158,189	36,621	298,138	520,640	0	0	0	0	0
Total	**4,579,629**	**2,448,079**	**10,815,746**	**9,174,001**	**35,152**	**19,378**	**21**	**9**	**0**

	Measured Flows		[3]Unmonitored Flows		Total Flow	
Month	**[1]Storm Outfalls**	**[2]CSO Outfalls**	**Storm Outfalls**	**CSO Outfalls**	**Storm Outfalls**	**CSO Outfalls**
January	737,961	0	825,606	0	1,563,567	0
February	507,930	0	1,794,755	0	2,302,685	0
March	1,507,668	0	6,349,336	0	7,857,004	0
April	1,292,674	0	3,491,731	0	4,784,405	0
May	5,894,247	22,176	16,897,532	0	22,791,780	22,176
June	3,823,458	38	8,399,202	0	12,222,660	38
July	3,390,555	18,693	6,221,563	0	9,612,118	18,693
August	4,456,591	13,648	8,080,715	0	12,537,307	13,648
September	3,541,882	5	6,801,968	0	10,343,850	5
October	2,488,962	0	4,465,877	0	6,954,840	0
November	1,366,295	0	1,302,129	0	2,668,424	0
December	1,093,405	0	1,232,370	0	2,325,776	0
Total	**30,101,628**	**54,560**	**65,862,786**	**0**	**95,964,415**	**54,560**

Note: [1]Measured Storm flows are actual flow volumes measured from Storm outfalls: 30th Ave, Quesnell, Groat Road, Kennedale Storm/STS/Wetland, Belgravia, Mill Creek (factored).

[2]Measured CSO flows are actual flow volumes measured from CSOs: Rat Creek, Capilano, Highlands, Cromdale, and Strathearn.

[3]Unmonitored flow volumes include estimates from monitored sites when measurements not available in addition to other remaining sites.

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2021

Total Suspended Solids (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	18	22	6	5	-	-	-	7	0
February	113	38	180	17	-	-	-	6	0
March	103	238	121	31	-	-	-	40	0
April	59	267	58	28	-	-	-	20	0
May	101	133	131	118	455	455	-	35	2
June	184	131	186	95	788	-	-	40	0
July	85	340	77	91	1,120	1,120	-	24	2
August	43	93	56	39	899	920	920	24	1
September	102	98	62	74	805	-	-	37	1
October	39	64	42	43	-	-	-	17	0
November	9	7	4	7	-	-	-	8	0
December	8	311	3	26	-	-	-	9	0
Mean Annual FWC =	**87**	**153**	**93**	**62**	**828**	**737**	**920**	**267**	**6**

Mean Annual FWC for all Storm = **87**

Mean Annual FWC for all CSO = **796**

Biochemical Oxygen Demand (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	10	14	8	3	-	-	-	7	0
February	11	12	19	7	-	-	-	4	0
March	13	28	15	9	-	-	-	34	0
April	7	22	6	8	-	-	-	18	0
May	7	13	9	13	127	127	-	32	2
June	11	22	10	19	166	-	-	40	0
July	10	47	6	17	205	0	-	23	1
August	9	19	6	8	240	228	228	23	1
September	10	12	7	9	292	-	-	36	1
October	21	25	8	9	-	-	-	17	0
November	11	2	3	5	-	-	-	8	0
December	5	19	3	4	-	-	-	9	0
Mean Annual FWC =	**10**	**20**	**9**	**10**	**187**	**115**	**228**	**251**	**5**

Mean Annual FWC for all Storm = **11**

Mean Annual FWC for all CSO = **161**

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2021 (Cont.)

Total Phosphorus (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	0.7	0.1	0.1	0.2	-	-	-	7	0
February	1.8	0.2	0.5	0.4	-	-	-	6	0
March	0.2	1.1	0.5	0.5	-	-	-	43	0
April	1.1	0.7	0.2	0.3	-	-	-	20	0
May	0.2	0.3	0.3	0.4	2.8	2.8	-	35	3
June	0.2	0.4	0.4	0.4	5.7	-	-	40	1
July	0.3	0.7	0.2	0.4	2.8	0.0	-	25	2
August	0.3	0.3	0.2	0.2	4.4	4.2	4.2	26	1
September	0.2	0.3	0.3	0.3	5.4	-	-	37	1
October	0.1	0.5	0.4	0.2	-	-	-	17	0
November	0.3	0.1	0.2	0.2	-	-	-	8	0
December	9.7	1.0	0.2	0.3	-	-	-	10	0
Mean Annual FWC =	**0.3**	**0.5**	**0.3**	**0.3**	**3.2**	**2.3**	**4.2**	**274**	**8**

Mean Annual FWC for all Storm = **0.3**

Mean Annual FWC for all CSO = **2.9**

Nitrite + Nitrate (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	4.1	1.0	1.5	3.1	-	-	-	7	0
February	2.8	1.0	1.2	2.3	-	-	-	6	0
March	1.1	0.6	0.7	1.0	-	-	-	43	0
April	2.2	0.8	1.0	0.8	-	-	-	20	0
May	1.0	0.8	0.7	0.6	0.3	0.3	-	35	3
June	1.8	0.8	0.8	0.8	0.0	-	-	40	1
July	1.9	0.8	0.9	0.9	0.5	0.0	-	25	2
August	1.7	0.7	1.0	0.6	0.3	0.4	0.4	26	1
September	1.3	0.6	0.8	1.0	0.1	-	-	37	1
October	1.6	0.7	0.9	0.9	-	-	-	17	0
November	2.8	1.0	1.0	1.4	-	-	-	8	0
December	2.3	0.9	1.3	2.0	-	-	-	10	0
Mean Annual FWC =	**1.7**	**0.7**	**0.9**	**1.0**	**0.4**	**0.3**	**0.4**	**274**	**8**

Mean Annual FWC for all Storm = **1.1**

Mean Annual FWC for all CSO = **0.3**

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2021 (Cont.)

Ammonia Nitrogen (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	0.5	1.4	0.5	0.8	-	-	-	7	0
February	1.0	1.4	0.8	1.0	-	-	-	6	0
March	1.1	1.0	0.7	1.3	-	-	-	43	0
April	0.9	0.5	0.4	0.7	-	-	-	20	0
May	0.3	0.4	0.2	0.2	9.6	9.6	-	35	3
June	0.1	0.3	0.2	0.3	14.0	-	-	40	1
July	0.5	0.7	0.3	0.5	4.1	0.0	-	25	2
August	0.4	0.4	0.4	0.3	10.0	8.6	8.6	26	1
September	0.3	0.3	0.3	0.2	16.3	-	-	37	1
October	0.4	0.6	0.5	0.2	-	-	-	17	0
November	0.5	1.2	0.7	0.5	-	-	-	8	0
December	1.7	1.3	0.6	0.9	-	-	-	10	0
Mean Annual FWC =	**0.5**	**0.5**	**0.4**	**0.5**	**7.6**	**6.8**	**8.6**	**274**	**8**

Mean Annual FWC for all Storm = **0.5** Mean Annual FWC for all CSO = **7.3**

Total Kjeldahl Nitrogen (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	1.4	2.0	1.5	1.7	-	-	-	7	0
February	3.6	2.3	3.0	2.3	-	-	-	6	0
March	3.5	4.7	2.9	3.1	-	-	-	43	0
April	2.3	3.0	1.7	2.5	-	-	-	20	0
May	1.5	1.5	1.8	2.3	18.6	18.6	-	35	3
June	2.3	2.3	2.0	2.5	37.8	-	-	40	1
July	2.0	4.4	1.5	2.3	14.9	0.0	-	25	2
August	1.8	2.2	1.5	1.6	27.2	25.0	25.0	26	1
September	1.8	1.8	1.6	1.6	37.4	-	-	37	1
October	1.8	2.0	1.9	1.3	-	-	-	17	0
November	1.4	1.9	1.5	1.8	-	-	-	8	0
December	2.7	5.0	1.2	2.1	-	-	-	10	0
Mean Annual FWC =	**2.1**	**2.5**	**1.9**	**2.2**	**19.5**	**15.0**	**25.0**	**274**	**8**

Mean Annual FWC for all Storm = **2.1** Mean Annual FWC for all CSO = **17.9**

Water quality monitoring sites include: 30th Ave, Quesnell, Groat Road and Kennedale Storm outfalls; and Rat Creek and Capilano CSOs.
FWC (mg/L) = Flow weighted concentration = 1000 x Constituent load (kg) / Volume (m3) per site for a monthly or annual period
Concentrations for unsampled flows were estimated or interpolated
No. of samples includes wet-weather and baseflow sampling. QA/QC samples not included in totals.
'-' - Concentration could not be calculated due to no flow present.

Table 4: Constituent Loads for 2021

Total Suspended Solids (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	2,714	69	1,166	1,801	5,750	4,862	**15,402**	1,100	2,529	870	565	**4,790**	0	0	0	0	0	**0**
February	18,029	378	101,627	6,150	126,184	97,560	**317,327**	20,080	50,079	17,222	11,182	**93,583**	0	0	0	0	0	**0**
March	45,105	66,048	150,749	31,393	293,294	298,835	**902,253**	80,209	159,398	54,816	35,593	**310,124**	0	0	0	0	0	**0**
April	14,136	31,413	49,783	14,299	109,632	113,301	**353,302**	40,458	63,774	21,932	14,240	**130,369**	0	0	0	0	0	**0**
May	96,250	89,650	244,389	217,635	647,925	933,419	**2,761,425**	444,987	559,033	174,843	111,574	**1,180,081**	5,586	4,500	0	10,086	303	**10,389**
June	97,912	40,981	210,382	91,274	440,549	695,134	**2,052,297**	484,205	328,936	147,243	76,314	**916,615**	30	0	0	30	0	**31**
July	40,051	60,869	74,890	63,130	238,940	368,410	**990,489**	127,565	174,969	73,363	38,878	**383,139**	15,065	5,870	0	20,935	209	**21,144**
August	21,947	34,245	68,437	40,864	165,493	219,619	**611,999**	79,147	86,267	53,856	27,246	**226,888**	8,433	3,909	19	12,361	124	**12,485**
September	45,132	27,786	69,706	59,425	202,050	260,928	**735,590**	78,160	120,770	64,800	28,265	**272,612**	4	0	0	4	0	**4**
October	14,134	11,721	34,908	24,417	85,179	31,807	**234,068**	28,257	57,449	22,956	15,427	**117,082**	0	0	0	0	0	**0**
November	1,379	44	2,209	3,882	7,514	3,767	**15,364**	1,149	2,054	706	459	**4,083**	0	0	0	0	0	**0**
December	1,243	11,404	917	13,706	27,270	20,639	**69,923**	6,004	11,166	3,840	2,493	**22,014**	0	0	0	0	0	**0**
Total	**398,031**	**374,608**	**1,009,164**	**567,976**	**2,349,778**	**3,048,280**	**9,059,440**	**1,391,322**	**1,616,423**	**636,447**	**362,237**	**3,661,381**	**29,119**	**14,278**	**19**	**43,416**	**636**	**44,052**

Total Load From Storm and CSO = 9,103,492

Biochemical Oxygen Demand (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	1,498	44	1,555	882	3,979	3,704	**11,411**	900	1,947	670	435	**3,729**	0	0	0	0	0	**0**
February	1,765	117	11,032	2,404	15,318	10,820	**36,249**	2,014	5,485	1,886	1,225	**10,111**	0	0	0	0	0	**0**
March	5,576	7,827	18,520	8,542	40,467	36,752	**117,455**	11,528	20,142	6,927	4,498	**40,236**	0	0	0	0	0	**0**
April	1,754	2,590	5,333	4,139	13,815	10,601	**38,430**	5,219	6,438	2,214	1,438	**14,014**	0	0	0	0	0	**0**
May	7,090	8,695	16,464	24,042	56,291	75,416	**229,197**	38,429	45,548	13,983	9,061	**97,490**	1,559	1,256	0	2,815	84	**2,900**
June	6,048	6,806	11,746	18,137	42,736	53,825	**164,527**	35,784	23,809	11,347	5,901	**67,967**	6	0	0	6	0	**6**
July	4,811	8,442	5,886	11,678	30,817	41,934	**118,448**	14,763	22,505	7,082	5,008	**45,697**	2,758	0	0	2,758	38	**2,796**
August	4,721	6,798	7,415	8,331	27,266	30,289	**92,339**	11,768	13,854	8,048	4,032	**34,783**	2,247	969	5	3,220	32	**3,252**
September	4,429	3,429	8,323	7,223	23,405	29,340	**84,291**	9,408	13,553	7,565	3,355	**31,547**	1	0	0	1	0	**1**
October	7,685	4,520	6,583	5,012	23,801	29,196	**88,156**	9,067	16,684	7,039	4,618	**35,159**	0	0	0	0	0	**0**
November	1,795	11	1,714	2,344	5,864	3,643	**13,874**	1,441	2,095	720	468	**4,367**	0	0	0	0	0	**0**
December	825	701	875	2,271	4,672	3,285	**11,286**	818	1,731	595	387	**3,329**	0	0	0	0	0	**0**
Total	**47,998**	**49,980**	**95,447**	**95,005**	**288,430**	**328,806**	**1,005,662**	**141,138**	**173,790**	**68,076**	**40,424**	**388,427**	**6,571**	**2,225**	**5**	**8,801**	**155**	**8,956**

Total Load From Storm and CSO = 1,014,618

Total Phophorus (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	37	0	24	85	146	77	**302**	19	41	14	9	**78**	0	0	0	0	0	**0**
February	111	2	256	129	498	311	**1,105**	62	159	55	36	**296**	0	0	0	0	0	**0**
March	291	296	643	528	1,758	1,467	**4,859**	482	811	279	181	**1,634**	0	0	0	0	0	**0**
April	80	78	178	157	493	369	**1,355**	185	225	78	50	**493**	0	0	0	0	0	**0**
May	256	186	618	765	1,826	2,348	**7,218**	1,200	1,411	450	281	**3,044**	34	27	0	62	2	**63**
June	202	130	491	407	1,231	1,695	**5,156**	1,188	792	357	188	**2,230**	0	0	0	0	0	**0**
July	119	134	242	259	754	1,069	**2,984**	413	526	206	118	**1,161**	38	0	0	38	1	**38**
August	125	123	290	247	785	1,207	**3,056**	384	422	235	117	**1,064**	41	18	0	59	1	**60**
September	131	92	285	205	713	952	**2,685**	303	436	246	109	**1,020**	0	0	0	0	0	**0**
October	97	86	289	102	575	483	**1,836**	202	369	156	102	**778**	0	0	0	0	0	**0**
November	35	1	110	82	228	151	**541**	45	82	28	18	**162**	0	0	0	0	0	**0**
December	50	35	51	159	295	200	**696**	48	105	36	23	**201**	0	0	0	0	0	**0**
Total	**1,535**	**1,164**	**3,478**	**3,126**	**9,302**	**10,331**	**31,793**	**4,532**	**5,378**	**2,140**	**1,234**	**12,160**	**114**	**45**	**0**	**159**	**3**	**162**

Total Load From Storm and CSO = 31,955

Table 4: Constituent Loads for 2021 (Cont.)

Nitrite + Nitrate (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	628	3	285	1,064	1,980	1,144	**4,290**	289	605	208	135	**1,166**	0	0	0	0	0	**0**
February	447	10	669	828	1,954	1,010	**3,859**	150	500	172	112	**896**	0	0	0	0	0	**0**
March	496	168	842	990	2,496	1,693	**6,284**	722	990	341	221	**2,095**	0	0	0	0	0	**0**
April	535	88	825	415	1,864	1,350	**5,486**	1,048	946	325	211	**2,271**	0	0	0	0	0	**0**
May	983	556	1,373	1,159	4,070	6,736	**20,290**	4,464	4,066	1,273	787	**9,483**	4	3	0	8	0	**8**
June	984	251	947	783	2,965	4,747	**13,940**	3,264	2,236	983	554	**6,228**	0	0	0	0	0	**0**
July	893	145	909	598	2,546	4,446	**11,994**	1,992	2,164	843	498	**5,002**	6	0	0	6	0	**6**
August	854	275	1,182	632	2,943	6,935	**15,353**	2,188	2,128	1,141	560	**5,475**	3	2	0	4	0	**4**
September	555	160	880	832	2,427	3,897	**10,328**	1,195	1,765	918	423	**4,005**	0	0	0	0	0	**0**
October	587	127	776	502	1,992	3,248	**7,745**	762	1,097	516	319	**2,505**	0	0	0	0	0	**0**
November	449	7	496	710	1,662	983	**3,711**	300	536	184	120	**1,065**	0	0	0	0	0	**0**
December	362	32	377	1,038	1,810	1,066	**3,905**	225	549	189	122	**1,029**	0	0	0	0	0	**0**
Total	**7,773**	**1,823**	**9,562**	**9,551**	**28,709**	**37,256**	**107,185**	**16,600**	**17,582**	**7,093**	**4,062**	**41,220**	**14**	**5**	**0**	**18**	**0**	**19**

Total Load From Storm and CSO = 107,204

Ammonia Nitrogen (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	75	4	92	269	440	212	**875**	58	114	39	25	**222**	0	0	0	0	0	**0**
February	161	14	478	353	1,006	562	**2,089**	101	284	98	63	**521**	0	0	0	0	0	**0**
March	496	278	872	1,321	2,968	1,941	**7,204**	744	1,108	381	247	**2,295**	0	0	0	0	0	**0**
April	219	56	307	352	933	582	**2,406**	382	385	132	86	**891**	0	0	0	0	0	**0**
May	322	290	437	441	1,489	2,167	**6,505**	1,117	1,328	415	264	**2,848**	117	94	0	212	6	**218**
June	79	91	267	257	694	959	**2,889**	650	440	197	110	**1,236**	1	0	0	1	0	**1**
July	212	117	323	365	1,017	1,569	**4,271**	609	746	312	169	**1,685**	54	0	0	54	1	**55**
August	227	141	467	302	1,137	2,050	**4,970**	677	691	389	193	**1,782**	94	37	0	130	1	**132**
September	115	84	384	184	767	1,203	**3,179**	363	524	282	129	**1,209**	0	0	0	0	0	**0**
October	160	116	392	128	796	1,081	**2,955**	309	488	219	139	**1,078**	0	0	0	0	0	**0**
November	88	8	367	247	710	477	**1,701**	144	259	89	58	**514**	0	0	0	0	0	**0**
December	271	47	179	470	967	675	**2,295**	144	348	120	78	**654**	0	0	0	0	0	**0**
Total	**2,424**	**1,246**	**4,566**	**4,689**	**12,925**	**13,480**	**41,338**	**5,299**	**6,715**	**2,673**	**1,560**	**14,933**	**266**	**131**	**0**	**397**	**8**	**406**

Total Load From Storm and CSO = 41,744

Total Kjeldahl Nitrogen (kg)

	Storm Outfalls							Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	**Total Storm**	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Creek**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	220	6	284	593	1,103	626	**2,380**	169	334	115	75	**651**	0	0	0	0	0	**0**
February	578	23	1,675	797	3,072	1,922	**6,805**	370	978	336	218	**1,811**	0	0	0	0	0	**0**
March	1,526	1,290	3,592	3,067	9,476	7,513	**25,512**	2,591	4,195	1,442	937	**8,522**	0	0	0	0	0	**0**
April	551	355	1,484	1,289	3,679	2,479	**9,778**	1,491	1,594	548	356	**3,620**	0	0	0	0	0	**0**
May	1,403	990	3,353	4,215	9,961	13,249	**40,979**	7,539	8,001	2,522	1,577	**17,770**	228	184	0	412	12	**425**
June	1,217	729	2,206	2,408	6,561	8,688	**26,619**	5,984	4,084	1,824	961	**11,370**	1	0	0	1	0	**1**
July	939	793	1,481	1,587	4,800	7,024	**19,497**	2,776	3,466	1,336	783	**7,674**	200	0	0	200	3	**203**
August	945	793	1,849	1,698	5,285	8,262	**20,826**	2,684	2,868	1,598	795	**7,279**	255	106	1	362	4	**366**
September	777	519	1,769	1,306	4,371	6,125	**16,918**	1,924	2,753	1,527	696	**6,422**	0	0	0	0	0	**0**
October	634	370	1,600	761	3,365	3,767	**11,482**	1,193	2,015	875	563	**4,350**	0	0	0	0	0	**0**
November	232	12	772	933	1,949	1,051	**4,147**	327	575	198	128	**1,147**	0	0	0	0	0	**0**
December	432	183	363	1,091	2,069	1,363	**4,776**	311	709	244	158	**1,344**	0	0	0	0	0	**0**
Total	**9,453**	**6,064**	**20,430**	**19,745**	**55,691**	**62,068**	**189,719**	**27,358**	**31,573**	**12,566**	**7,247**	**71,959**	**686**	**290**	**1**	**977**	**19**	**995**

Total Load From Storm and CSO = 190,714

Table 5: 2021 Rat Creek CSO Concentration Statistics

		TSS			BOD			TP			*E Coli.*
		Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Geometric Mean
Month	CSO Events	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(MPN/100 mL)
January	0	-	-	-	-	-	-	-	-	-	-
February	0	-	-	-	-	-	-	-	-	-	-
March	0	-	-	-	-	-	-	-	-	-	-
April	0	-	-	-	-	-	-	-	-	-	-
May	1	455.0	455.0	455.0	127.0	127.0	127.0	2.8	2.8	2.8	1,835,000
June	1	787.5	787.5	787.5	166.0	166.0	166.0	5.7	5.7	5.7	1,422,500
July	3	1009.2	1120.0	787.5	192.0	205.0	166.0	2.8	2.8	2.8	1,132,135
August	2	891.3	920.0	862.5	244.0	260.0	228.0	4.5	4.8	4.2	2,660,000
September	1	805.0	805.0	805.0	292.0	292.0	292.0	5.4	5.4	5.4	2,660,000
October	0	-	-	-	-	-	-	-	-	-	-
November	0	-	-	-	-	-	-	-	-	-	-
December	0	-	-	-	-	-	-	-	-	-	-

		NH^3			NO^3+NO^2			TKN		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum
Month	CSO Events	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
January	0	-	-	-	-	-	-	-	-	-
February	0	-	-	-	-	-	-	-	-	-
March	0	-	-	-	-	-	-	-	-	-
April	0	-	-	-	-	-	-	-	-	-
May	1	9.6	9.6	9.6	0.3	0.3	0.3	18.6	18.6	18.6
June	1	14.0	14.0	14.0	0.0	0.0	0.0	37.8	37.8	37.8
July	3	5.0	6.8	4.1	0.5	0.5	0.4	15.5	16.8	14.9
August	2	10.5	12.5	8.6	0.3	0.4	0.2	28.1	31.2	25.0
September	1	16.3	16.3	16.3	0.1	0.1	0.1	37.4	37.4	37.4
October	0	-	-	-	-	-	-	-	-	-
November	0	-	-	-	-	-	-	-	-	-
December	0	-	-	-	-	-	-	-	-	-

Note: Number of samples might not equal to number of CSO events due to sampler malfunction and extended sampling event.

TABLE 6: List of Certified Wastewater Collection System Operators

Certified Wastewater Collection System Operators per Level of WWC Certification:

(1) Operators Level IV WWC Certified
(3) Operators Level III WWC Certified
(49) Operators Level II WWC Certified
(35) Operators Level I WWC Certified

Name	Title	WWC Certification Level
Fechner, Frank	Senior Manager, Operational Strategies	IV
Bertin, Wendy	Engineering Technologist	III
Gunderson, John	Engineering Technologist	III
L'Heureux, Robin	Engineering Technologist	III
Acker, Timothy	Drainage System MTV Operator	II
Benson, Leon	Drainage System Combo Operator	II
Bishop, Shawn	Drainage System Combo Operator	II
Blinn, Bill	Tradesman (Millwright 2 / Welder)	II
Branicki, Roman	Labour Foreman 1	II
Bronca, Robert	Labour Foreman 3	II
Brownoff, Nicholas	Tradesman (Millwright)	II
Charrupi, Carlos	Maintenance Repairman I	II
Cuglietta, Carmine	Labour Foreman 1	II
Dennis, Clarence	Labour Foreman 3	II
Ewing, Nicole	Engineering Technologist	II
Ferenac, Nikola	Labour Foreman 3	II
Forrest, Scott	Water System Technical Support / Special	II
Fraser, Gordon	Labourer 2	II
Gawreletz, Kevin	Labour Foreman 1	II
Gilker, Michael	Sewer Substructure Inspector	II
Goodine, John	Tradesman (Millwright 2)	II
Guidoccio, Natalino	Drainage System Serviceman	II
Hajar, Norm	Millwright Foreman	II
Hammond, Richard	Labourer 3	II
Hillier, Denis	Foreman (Dual Trade)	II
Horrocks, Curtis	Drainage System MTV Operator	II
Khakh, Surjit	Engineering Technologist	II
Lawson, Linsey	Engineering Technologist	II
Littlechilds, Stan	Drainage Network Specialist	II
Lirazan, Warren	Labourer 3	II
Lukenbill, Durward (Dylan)	Tradesman (Millwright 2)	II

Name	Title	WWC Certification Level
Macrury, Robert	Labour Foreman 1	II
Manao, Manuel	Sewer Substructure Inspector	II
Marcoux-Mansbridge, Nikita	Tradesman (Millwright)	II
McConnell, Peter	Drainage System MTV Operator	II
Miller, Wade	Tradesman (Millwright 2)	II
Montague, Thomas (Ian)	Labour Foreman 3	II
Murphy, Steven	Drainage System Combo Operator	II
Nelson, Tim	Environmental Specialist	II
Pearce, Craig	Drainage Network Specialist	II
Perron, Clayton	Tradesman (Millwright 2)	II
Persaud, Shawna	Equipment Operator 3	II
Powell, Ryan	Tradesman (Millwright)	II
Rivard, Shaune	Drainage Network Specialist	II
Samarasinghe, Kalutota	Labourer 2	II
Schlacht, Shawn	Labour Foreman 3	II
Sigstad, Lane	Tradesman (Millwright 2)	II
Soni, Rohit	Planner (FCF Maintenance)	II
Sorenson, Melvin	Labour Foreman 1	II
Sorenson, Tim	Labour Foreman 3	II
Ursuliak, Wes	Labour Foreman 3	II
Webster, Kenneth	Labour Foreman 3	II
Yang, Guang	Drainage System Combo Operator	II
Ambrosio, Jeffrey	Sewer Substructure Inspector	I
Aniskou, Evgeni	Engineering Technologist	I
Bellerose, Richard	Tradesman (Millwright 2)	I
Braunig, Alex	Drainage System MTV Operator	I
Burns, Russel	Labourer 3	I
Campbell, Brent	Sewer Substructure Inspector	I
Casella, Carmen	Labourer 3	I
Clark, Daniel	Drainage Network Specialist	I
Coburn, Arthur	Labourer 3	I
Dilts, Scott	Drainage System Combo Operator	I
Divino, Patrick	Drainage System Serviceman	I
Dowds, Alexander	Labourer 3	I

Name	Title	WWC Certification Level
Draghici, Courtney	Drainage System Combo Operator	I
Dzenkiw, Michelle	Manager, Service Maintenance	I
Fehr, Brittany	Engineering Technologist	I
Goonewardane, Anton	Equipment Operator 3	I
Guidoccio, Nicholas	Labourer 3	I
Handfield, Terrence	Drainage System Combo Operator	I
Hill, James	Electrician 1	I
Hao, Yufu (Owen)	Industrial Wastewater Inspector	I
Ledl, Ryan	Industrial Wastewater Investigator	I
Ledrew, Travis	Labour Foreman 1	I
MacPherson, Blayne	Drainage System Combo Operator	I
McHale, Ken	Drainage System Combo Operator	I
McKay, Brandy	Engineering Technologist	I
McLellan, Christine	Drainage Network Specialist	I
Rahal, Osman	Engineering Technologist	I
Runco, Frank	Drainage System Combo Operator	I
Sedurante, Benjamin	Sewer Substructure Inspector	I
Slonetzky, Tyler	Sewer Substructure Inspector	I
Spila, Leanne	Drainage Network Specialist	I
Swanson, Amy	Labour Foreman 1	I
Trahan, Tessa	Industrial Wastewater Investigator	I
Underhay, Dominic	Drainage System Combo Operator	I
Valentini, Marco	Maintenance Repairman 1	I

TABLE 7: 2021 Annual Product Usage at Pump Stations

There was no product usage at pump stations in 2021

Pump Station	Product	Total Addition (Litres)
---	---	0
	Total Usage:	**0**

TABLE 8: 2021 Annual Usage of Reward® Herbicide

Date of Application	Stormwater Management Facility	Quantity Used (L)
18-Jun-21	Ambleside #5 (1264 – Ainslie Way SW)	15
21-Jun-21	Chappelle #6 (Chappelle Way & Crawford Drive SW)	15
24-Jun-21	Walker #4 North (24 Avenue & 53 Street SW)	15
24-Jun-21	Walker #4 South (22 Avenue & Watts Drive SW)	11
07-Jul-21	Andorra (169 Avenue & 93 Street NW)	15

Total Usage (L): 71
Total Number of Applications: 5

Table 9a: 2021 Usage of Potassium Permanganate

The use of Potassium Permanganate in the **Monitoring and Compliance** section is related to the identification of cross-connections in the collection system and supports enforcement activities associated with Drainage Bylaw 18100 (EPCOR) and Drainage Bylaw 18093 (City of Edmonton) and investigations of industrial and commercial customers.

Date Tested	Location of Test	Department / Section	Tests per Location	Potassium Permanganate (g)
---	No tests completed	---	0	0
			Total Usage (g):	**0**
			Total Number of Tests:	**0**

Table 9b: 2021 Usage of Bright Dye

The use of Bright Dye in the **Environmental Services** section is related to the identification of cross-connections in the collection system. The **Monitoring & Compliance** usage supports enforcement activities associated with Drainage By-law 18100 (EPCOR) and Drainage By-Law 18093 (City of Edmonton) and investigations of industrial and commercial customers.

Date Tested	Location of Test	Department / Section	Tests per Location	Bright Dye (ml)
05-Mar-21	10349 – Jasper Avenue NW	Monitoring & Compliance	3	30
01-Apr-21	7225 – 50 Street NW	Monitoring & Compliance	1	10
07-Apr-21	16615 – 83 Avenue NW	Field Operations	1	20
17-Jun-21	11950 – 167 Street NW	Monitoring & Compliance	1	60
17-Jun-21	16712 – 118 Avenue NW	Monitoring & Compliance	1	100
25-Jun-21	100 St. & Jasper Avenue NW	Field Operations	1	235
28-Jun-21	115 Avenue & 91 Street NW	Field Operations	1	45
19-Jul-21	114 Avenue & 178 Street NW	Field Operations	1	45
30-Aug-21	40 Avenue & 114 Street NW	Field Operations	1	30
28-Oct-21	6003C – 92 Street NW	Monitoring & Compliance	2	150
18-Nov-21	14715-116 Avenue NW	Monitoring & Compliance	1	25
19-Nov-21	6003C – 92 Street NW	Monitoring & Compliance	1	25

Table 10: 2021 Usage of De-Icing Product (Arctic Blast)

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
04-Jan-21	126	Ramsay Ravine	1	30
05-Jan-21	118	Big Lake	1	50
05-Jan-21	298	North Sask. River	1	50
05-Jan-21	258	Wedgewood Creek	1	30
05-Jan-21	274	Blackmud Creek	1	50
05-Jan-21	265	Whitemud Creek	1	70
06-Jan-21	264	Blackmud Creek	1	100
07-Jan-21	52	North Sask. River	1	70
07-Jan-21	153	North Sask. River	1	30
07-Jan-21	121	North Sask. River	1	50
07-Jan-21	N/A	Shallow Storm Line	1	20
08-Jan-21	192	Mill Creek	1	40
08-Jan-21	195	Mill Creek	1	90
08-Jan-21	92B	Mill Creek	1	60
08-Jan-21	191	Mill Creek	1	90
08-Jan-21	156	Fulton Ravine	1	50
11-Jan-21	108	North Sask. River	1	20
11-Jan-21	47	North Sask. River	1	100
11-Jan-21	109	North Sask. River	1	30
12-Jan-21	120	North Sask. River	1	100
13-Jan-21	25	North Sask. River	1	40
13-Jan-21	119	Westridge Ravine	1	40
14-Jan-21	47	North Sask. River	1	20
15-Jan-21	118	Big Lake	1	50
15-Jan-21	29	North Sask. River	1	40
15-Jan-21	21	North Sask. River	1	40
20-Jan-21	52	North Sask. River	1	90
20-Jan-21	58	North Sask. River	1	50
22-Jan-21	4	Whitemud Creek	1	100
25-Jan-21	30	North Sask. River	1	100
25-Jan-21	31	North Sask. River	1	100
26-Jan-21	183	North Sask. River	1	20
26-Jan-21	182	North Sask. River	1	20
26-Jan-21	1	Whitemud Creek	1	50
27-Jan-21	274	Blackmud Creek	1	80

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
27-Jan-21	275	Blackmud Creek	1	100
27-Jan-21	277	Blackmud Creek	1	100
28-Jan-21	265	Whitemud Creek	1	20
28-Jan-21	265	Whitemud Creek	1	110
28-Jan-21	125	Wellington Ravine	1	50
29-Jan-21	428012	Fulton Creek	1	40
29-Jan-21	139	Ramsay Ravine	1	50
29-Jan-21	126	Ramsay Ravine	1	40
29-Jan-21	124	Ramsay Ravine	1	40
29-Jan-21	123A	Ramsay Ravine	1	40
01-Feb-21	29	North Sask. River	1	100
01-Feb-21	24	North Sask. River	1	100
01-Feb-21	182	North Sask. River	1	40
01-Feb-21	183	North Sask. River	1	40
02-Feb-21	268	North Sask. River	1	30
02-Feb-21	148	North Sask. River	1	40
02-Feb-21	118	Big Lake	1	20
02-Feb-21	119	Westridge Ravine	1	110
02-Feb-21	21	North Sask. River	1	30
03-Feb-21	15	North Sask. River	1	100
03-Feb-21	257	Wedgewood Creek	1	100
03-Feb-21	249	Mill Creek	1	60
03-Feb-21	298	North Sask. River	1	120
04-Feb-21	126	North Sask. River	1	40
04-Feb-21	108	North Sask. River	1	20
04-Feb-21	47	North Sask. River	1	80
04-Feb-21	109	North Sask. River	1	20
04-Feb-21	191	Mill Creek	1	70
04-Feb-21	92B	Mill Creek	1	80
05-Feb-21	195	Mill Creek	1	30
05-Feb-21	195	Mill Creek	1	80
05-Feb-21	91	Mill Creek	1	60
05-Feb-21	192	Mill Creek	1	40
08-Feb-21	N/A	Shallow Storm Line	1	20
08-Feb-21	65	North Sask. River	1	70
08-Feb-21	121	North Sask. River	1	50
08-Feb-21	120	North Sask. River	1	70
08-Feb-21	23C	North Sask. River	1	60

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
11-Feb-21	125	Wellington Ravine	1	20
11-Feb-21	124	Ramsay Ravine	1	30
11-Feb-21	139	Ramsay Ravine	1	30
11-Feb-21	78	Goldbar Creek	1	60
12-Feb-21	126	Ramsay Ravine	1	20
12-Feb-21	123	Ramsay Ravine	1	30
12-Feb-21	153	North Sask. River	1	30
12-Feb-21	52	North Sask. River	1	60
12-Feb-21	156	Fulton Creek	1	50
12-Feb-21	57	North Sask. River	1	70
12-Feb-21	58	North Sask. River	1	80
24-Feb-21	312	North Sask. River	1	50
24-Feb-21	277	Blackmud Creek	1	80
25-Feb-21	53	North Sask. River	1	40
25-Feb-21	24	North Sask. River	1	70
25-Feb-21	MH	North Sask. River	1	40
25-Feb-21	121	North Sask. River	1	60
25-Feb-21	152	North Sask. River	1	40
25-Feb-21	268	North Sask. River	1	40
25-Feb-21	267	North Sask. River	1	40
25-Feb-21	107	North Sask. River	1	40
26-Feb-21	87	Kennedale Ravine	1	80
26-Feb-21	57	North Sask. River	1	100
26-Feb-21	58	North Sask. River	1	100
26-Feb-21	59	North Sask. River	1	80
26-Feb-21	313	Whitemud Creek	1	100
26-Feb-21	195	Mill Creek	1	90
26-Feb-21	3	Mill Creek	1	30
26-Feb-21	4	Mill Creek	1	60
26-Feb-21	46	North Sask. River	1	80
26-Feb-21	46	North Sask. River	1	20
27-Feb-21	23C	North Sask. River	1	60
27-Feb-21	120	North Sask. River	1	60
27-Feb-21	312	North Sask. River	1	20
27-Feb-21	313	Whitemud Creek	1	20
27-Feb-21	109	North Sask. River	1	40
27-Feb-21	47	North Sask. River	1	10
27-Feb-21	47	North Sask. River	1	80

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
27-Feb-21	274	North Sask. River	1	60
27-Feb-21	275	North Sask. River	1	40
27-Feb-21	265	North Sask. River	1	100
27-Feb-21	264	North Sask. River	1	50
27-Feb-21	15	North Sask. River	1	50
27-Feb-21	119	Westridge Ravine	1	50
27-Feb-21	257	North Sask. River	1	50
27-Feb-21	21	North Sask. River	1	30
01-Mar-21	207	Blackmud Creek	1	40
01-Mar-21	118	Big Lake	1	20
01-Mar-21	192	Mill Creek	1	40
01-Mar-21	92B	Mill Creek	1	80
02-Mar-21	207	Blackmud Creek	2	90
02-Mar-21	265	Whitemud Creek	1	90
03-Mar-21	101	North Sask. River	1	100
03-Mar-21	25	North Sask. River	1	40
03-Mar-21	120	North Sask. River	1	100
03-Mar-21	23C	North Sask. River	1	80
03-Mar-21	314	North Sask. River	1	20
03-Mar-21	298	North Sask. River	1	60
03-Mar-21	313	Whitemud Creek	1	20
03-Mar-21	136	Wellington Ravine	1	10
04-Mar-21	52	North Sask. River	1	10
04-Mar-21	156	Fulton Creek	1	40
04-Mar-21	121	North Sask. River	1	60
10-Mar-21	124	Ramsay Ravine	1	30
10-Mar-21	126	Ramsay Ravine	1	20
25-Mar-21	MH	Mill Creek	1	50
06-Apr-21	121	North Sask. River	1	30
16-Dec-21	124	Ramsay Ravine	1	20
16-Dec-21	123A	Ramsay Ravine	1	20
16-Dec-21	126	Ramsay Ravine	1	20
16-Dec-21	125	Wellington Ravine	1	50
17-Dec-21	183	North Sask. River	1	30
17-Dec-21	182	North Sask. River	1	20
20-Dec-21	87	Kennedale Ravine	1	60
20-Dec-21	88	Kennedale Ravine	1	30
20-Dec-21	123	Ramsay Ravine	1	60

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
21-Dec-21	21	North Sask. River	1	60
21-Dec-21	15	North Sask. River	1	50
21-Dec-21	119	Westridge Ravine	1	50
22-Dec-21	257	Wedgewood Creek	1	50

TABLE 11: 2021 Operational Issues - Drainage Services

Date of Occurrence	Location	Incident Description	Type	AEP Reference Number
05-Jan-21	10145-109 Street NW	Untreated wastewater (<1L) was released from a private sanitary pipe at a condominium complex. A contractor was completing work on the private services in the building parkade and damaged a sanitary line resulting in the release of untreated wastewater into a nearby drain. The storm / sanitary lines from the condominium complex are connected to the combined sewer system. This release was reported to AEP on January 5, 2021 by the building superintendent. A written report was not required by AEP.	Reportable-3rd Party Release	374922
06-Jan-21	10145-109 Street NW	A glycol solution (200L) was released from a cooling unit at a condominium complex. The glycol entered a floor sump and an unknown amount may have been released into the combined sewer system. A 3rd party company was called in to remove contaminants from the spill site and floor sump. This release was reported to AEP on January 6, 2021 by the building superintendent. A written report was not required by AEP.	Reportable-3rd Party Release	374975
14-Jan-21	12621-156 Street NW	Approximately 40-50 cubic meters of steam condensate was released into the sanitary collection system from Hexion Canada Inc. A mechanical issue at this facility resulted in a blowdown of steam condensate containing phenol residue. A Notice to Comply was issued to Hexion to discontinue the release of restricted waste (phenol) to the sewerage system. This release was reported to AEP on January 14, 2021 by Hexion Canada. A written report was issued to AEP on January 21, 2021.	Reportable-3rd Party Release	375183
20-Jan-21	2909-113 Avenue NW	A glycol solution (approx. 2L) was released into the sanitary collection system from the ACT Aquatic and Recreation Center. A leak from a boiler room pump caused a release of glycol into a floor drain connected to the sanitary system. Absorbent pads were used to clean up the spill site. This release was reported to AEP on January 20, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	375341
21-Jan-21	14712-Riverbend Road NW	Potable water (unknown volume) was released into the storm collection system. EPCOR equipment struck a fire hydrant causing potable water to flow down the road into a nearby storm catch basin (CB #226546). Dechlorination pucks were placed around the catch basin to remove chlorine residue before the water entered into the storm collection system. Additional EPCOR crews responded to the site shutting off the water to the impacted fire hydrant and stopping the release of potable water. This release was reported to AEP on January 21, 2021. A written report was issued to AEP on January 28, 2021.	Reportable-Internal	375380
24-Jan-21	67-Street & Roper Road NW	Untreated wastewater (unknown volume) was released into the storm collection system (CB449560) from a sanitary manhole surcharge. EPCOR equipment was mobilized to clear the blockage (fats, grease and solids) and remove contaminants from the impacted storm collection system and nearby roadway. A Notice to Comply was issued to a nearby property owner (Oxford Properties Industrial Inc.) to clean and maintain their private sanitary manhole. This release was reported to AEP on January 24, 2021. A written report was issued to AEP on January 29, 2021.	Reportable-Internal	375434
25-Jan-21	13221-Buena Vista Road NW	EPCOR received laboratory results from a storm sewer sample (MH223525) collected downstream of Pump Station #120. The sample results (800 CFU/100 ml) falls within the range of normal stormwater. The E. coli result of 800 CFU/100 ml is over the Drainage Bylaw 18100 limit of 200 CFU/100 mL and so was reported to Alberta Environment and Parks. There was no visual or olfactory signs supporting a release of sanitary waste. This release was reported to AEP on January 25, 2021. A written report was issued to AEP on January 28, 2021.	Reportable-Internal	375452
26-Jan-21	13003-56 Street NW	Motor oil (1L) was released into a sanitary floor drain at the City of Edmonton – North East Yard. Motor oil was contained within the floor drain and there was no release into the sanitary collection system. A 3rd party vacuum truck was called in to remove contaminants from the floor drain and spill site. This release was reported to AEP on January 26, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	375479
02-Feb-21	14707-53 Avenue NW	EPCOR Drainage investigators received laboratory results from a private storm manhole sample collected on January 26th at a residential condominium complex. The sample results for *E.coli* (820,000 CFU/100mL) indicated the presence of untreated wastewater in the storm collection system at this location. A Notice to Comply was issued to the property manager to discontinue the release of restricted / prohibited waste into the storm sewerage system. Drainage will conduct follow-up inspections / sampling to confirm that untreated	Reportable-3rd Party Release	375707

		wastewater is no longer being released into the storm collection system at this location. This release was reported to AEP on February 2, 2021. A written report was issued to AEP on February 3, 2021.		
08-Feb-21	9621-27 Avenue NW	Diesel fuel (approx. 100L) was released into the private storm collection system of a Coca-Cola production facility. 3rd party vacuum truck (GFL) was called in to clean up the spill site and the impacted storm collection system. EPCOR Drainage investigators have confirmed that there was no release of diesel fuel from the private storm sewer system into the EPCOR storm collection system. A Notice to Comply was issued to the company to discontinue the release of prohibited waste into the sewerage system. The company will also be required to install an oil / water pre-treatment facility downstream of their loading dock. This event was reported to AEP on February 8, 2021 by the City of Edmonton – Fire Services. A written report was issued to AEP on February 12, 2021.	Reportable-3rd Party Release	375863
13-Feb-21	8882-170 Street NW	Potable water (approx. 100L) was released into the storm collection system from a private construction site (All Services Drilling) at the West Edmonton Mall – Transit Centre. A damaged pump released potable water onto the roadway and into a nearby storm catch basin (CB235364). A front end loader was called in to remove the frozen potable water off the pavement. This release was reported to EPCOR Drainage Services by the company on February 18, 2021. A Notice to Comply was issued to the company to immediately report any future releases of other than permitted matter (Chlorine > 0.02 mg/L) into the storm sewerage system. This release was reported to AEP on February 18, 2021. A written report was issued to AEP on February 22, 2021.	Reportable-3rd Party Release	376202
25-Feb-21	34-Avenue & 34-Street NW	EPCOR responded to a report from Alberta Environment and Parks (AEP) that an unknown greenish substance was observed coming from Mill Creek outfalls #253 & #271. The complaint was originally from a City of Edmonton 311 call on February 19th, but was not reported to EPCOR until February 25th by AEP. EPCOR arrived on site on February 25th and did not see any evidence of a greenish substance at either outfall. The investigators notified AEP on February 25, 2021 that there was no evidence of a release at these locations.	Reportable-3rd Party Release	N/A
25-Feb-21	6342-34A Avenue NW	Transmission fluid (approx. 10L) was released from a vehicle at a private residence. EPCOR Drainage investigators received a report from Alberta Environment and Parks (AEP), that a vehicle was leaking transmission fluid that was draining towards a storm catch basin. Upon arrival at the site, the investigators observed the transmission fluid on the street, but the vehicle responsible for the release could not be located. City of Edmonton Roadways dispatched a crew to clean up the spill site. There was no release of transmission fluid to the storm / sanitary collection system.	Reportable-3rd Party Release	N/A
26-Feb-21	2959-Parsons Road NW	Glycol (40-50L) was released into the sanitary collection system at Ventura Foods Canada. A high pressure alarm on the company's boiler system triggered a release of glycol into a nearby floor drain. The release occurred on February 26th, but was not reported to Drainage Services until March 1st by the company. Company staff placed an absorbent boom / pads around the floor drain to remove excess glycol. A Notice to Comply was issued to the company to discontinue the release of other than permitted matter into the sewerage system. This release was reported to AEP on March 1, 2021 by the company. A written report was issued to AEP on March 3, 2021.	Reportable-3rd Party Release	376543
04-Mar-21	106-Street & Saskatchewan Drive NW	During a CCTV inspection review of a drill drop manhole (MH247738), a section of metal pipe was found to be fully deteriorated and a void behind the metal pipe was visible. This structural deficiency would have allowed untreated wastewater to be released into the surrounding soil. This drill drop manhole (DDMH) conveys untreated wastewater to the combined sewer system. The release of untreated wastewater would have been contained within the immediate vicinity of the DDMH and there would have been no above ground release of untreated wastewater. EPCOR is in the process of abandonment of this DDMH, which will stop the release of untreated wastewater to the surrounding soil. This release was reported to AEP on March 5, 2021. A written report was issued to AEP on March 11, 2021.	Reportable-Internal	376680
05-Mar-21	119-Avenue & 88 Street NW	Hydraulic fluid (approx. 10-20L) was released at an EPCOR Contractor (Shanghai Construction Group) worksite. Hydraulic fluid entered a nearby combined sewer catch basin and was contained within the catch basin sump. A private vacuum truck (Vertex) was called in to clean up the spill site and impacted catch basin. There was no release of hydraulic fluid to the storm / combined collection system. This release was reported to AEP on March 5, 2021 by the contractor. A written report was not required by AEP.	Reportable-Internal	376684
05-Mar-21	17969-106 Avenue NW	Diesel fuel (approx. 100-150L) was released into the private storm collection system at EFI Global. Fuel from a vehicle accident was released onto a parking lot and then flowed into a nearby private storm catch basin. EPCOR arrived on-site and confirmed that an unknown volume of the 100-150L had migrated from the private catch basin and into the EPCOR storm collection system. A 3rd party vacuum truck was called in to clean up the impacted private sewer system and surrounding area. This release was reported to AEP on March 5, 2021 by the company. A written report was issued to AEP on March 10, 2021.	Reportable-3rd Party Release	376698
09-Mar-21	15210-58 Avenue NW	Untreated wastewater (approx. 500 cubic meters) was released into the storm collection system at the Brander Gardens Pump Station #103. Untreated wastewater from a sanitary manhole surcharge (MH223311) travelled downhill and into a nearby storm catch basin (CB547017). Untreated wastewater / stormwater from the storm collection system at this location was released into the North Saskatchewan River through Outfall #12 (OF223388). When the surcharge was identified, the release of untreated wastewater was	Reportable-Internal	376802

		stopped by EPCOR crews. EPCOR Drainage will continue to monitor and inspect pump stations on a regular basis and responds to spills or suspected overflows as soon as they are discovered or reported by a third party. This release was reported to AEP on March 9, 2021. A written report was issued to AEP on March 17, 2021.		
11-Mar-21	6903-116 Street NW	A propylene glycol solution (approx. 5000L) was released into the sanitary collection system at the OS Longman Building. The spill occurred when a contractor damaged a valve on the building coolant system and released the 50% glycol / 50% water solution into a nearby floor drain. This release was reported to AEP on March 11, 2021 by the building operator (BGIS Canada). A written report was not required by AEP.	Reportable-3rd Party Release	376857
13-Mar-21	11147-63 Avenue NW	Hydraulic fluid (approx. 30L) was released from a City of Edmonton plow truck into an alleyway. EPCOR observed that the stormwater being discharged into a nearby storm catch basin (CB225227) did not appeared to be contaminated with hydraulic fluid. Investigators placed absorbent pads / booms to contain the release. A 3rd party vacuum truck (GFL) was called in to remove hydraulic fluid residue from the spill site. This release was reported to AEP on March 13, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	376905
13-Mar-21	14402-114 Avenue NW	Asphalt (approx. 1L) was released into a storm catch basin (CB261359) at the City of Edmonton asphalt plant. EPCOR confirmed that the asphalt was contained within the catch basin sump and there was no release into the storm collection system. A 3rd party vacuum truck was called in to clean out the impacted catch basin. This release was reported to AEP on March 13, 2021 by the City of Edmonton. A written report was issued to AEP on March 18, 2021.	Reportable-3rd Party Release	376939
14-Mar-21	14725-Summit Drive NW	A slurry liquid (approx. 5 cubic meters) was released at an EPCOR Contractor (Shanghai Construction Group) worksite. The slurry was contained in a lowland area near the MacKinnon Ravine trail. A 3rd party vacuum truck was called in to clean up the spill site and remediation. There was no release of slurry to the storm / sanitary collection system. This release was reported to AEP by the contractor. A written report was issued to AEP on March 18, 2021.	Reportable-Internal	376918
15-Mar-21	1911-94 Street NW	EPCOR received laboratory results from a private storm manhole sample collected on February 26st at Teledyne Mircalyne Inc. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for pH = 5.4, Total Phosphorus at 1.06 mg/L, Chemical Oxygen Demand at 169 mg/L, Copper at 0.86 mg/L, Lead at 0.03 mg/L, and Zinc at 0.46 mg/L. A Notice to Comply was issued to the company to discontinue the release of restricted wastes into the sewerage system. This release was reported to AEP on March 15, 2021. A written report was issued to AEP on March 19, 2021.	Reportable-3rd Party Release	376953
17-Mar-21	9620-56 Avenue NW	EPCOR received laboratory results from a private sanitary manhole sample collected on February 11th at Sofina Foods Inc. The results of the sample exceeded Bylaw 18100 Appendix B Restricted Wastes Applicable to Sanitary and Combined Sewers for Total Phosphorus at 244 mg/L. A Notice to Comply was issued to the company to discontinue the release of restricted wastes into the sewerage system. This release was reported to AEP on March 17, 2021 by the company. A written report was not required by AEP.	Reportable-3rd Party Release	377042
22-Mar-21	11403-84 Street NW	Untreated wastewater (unknown volume) was released from interconnection #78 into the storm collection system. EPCOR identified a combined sewer line (PIP31904) that was partially plugged and releasing untreated wastewater through the interconnection into a nearby storm manhole (MH263708). The blockage (grease) was released by an EPCOR equipment. This event was forwarded to the EPCOR Monitoring and Compliance team to inspect upstream customers and engage in education and enforcement related to Drainage Bylaws 18100 and 18093. This release was reported to AEP on March 22, 2021. A written report was issued to AEP on March 26, 2021.	Reportable-Internal	377186
23-Mar-21	4420-Calgary Trail NW	Untreated wastewater (unknown volume) was released from a private sanitary manhole located at a business complex. EPCOR observed that untreated wastewater was surcharging from the private sanitary manhole and was migrating into a nearby private storm catch basin. The property management company for the complex arranged for a 3rd party vacuum truck (Suck-U-Sump) to release the sanitary line blockage and clean out contaminants from the impacted catch basin. This release was reported to AEP on March 23, 2021 by the property management company. A written report was issued to AEP on April 7, 2021.	Reportable-3rd Party Release	377227
25-Mar-21	6609-Gateway Boulevard NW	Hydraulic fluid (unknown volume) was released into the storm collection system at the City of Edmonton – Southwest District Yard. EPCOR observed that water contaminated with hydraulic fluid was coming out of a soil stockpile in the yard and releasing into a private storm catch basin. Storm catch basins in this area are connected to the combined sewer system, so any contaminated water that was released from the Southwest District Yard would flow to the Gold Bar WWTP for treatment. The City of Edmonton called in a 3rd party contractor (Nor-Alta) to remove the soil stockpile and clean up contaminants from the surrounding area. In the future, the soil stockpile at the Southwest District Yard will be stored in a manner that will not allow contaminants to drain into the sewerage system. This release was reported to AEP on March 25, 2021 by the City of Edmonton. A written report was issued to AEP on April 1, 2021.	Reportable-3rd Party Release	377304

29-Mar-21	11338-139 Avenue NW	Hydraulic fluid (approx. 20L) was released into a private storm catch basin at a residential townhouse complex. A City of Edmonton garbage truck had released hydraulic fluid into the catch basin at this location. EPCOR confirmed that the hydraulic fluid was contained within the catch basin and had not entered the storm collection system. A 3rd party vacuum truck was called in to remove contaminants from the impacted catch basin and downstream pipe. This release was reported to AEP on March 29, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	377378
31-Mar-21	SE of Wolf Willow Point NW	Approximately 4-5L of hydraulic oil, 5L of diesel fuel, 3L of windshield washer fluid and 300L of chlorinated water were released into the North Saskatchewan River (NSR) from a City of Edmonton sweeper near Outfall #13 (OF220505). The sweeper had accidently driven off the uphill path and into the NSR releasing a number of contaminants into the river. Due to dangerous conditions on the ice, not all of the contaminants were able to be removed by City of Edmonton staff and a 3rd party contractor. This release was reported to AEP on March 31, 2021 by the City of Edmonton. A written report was issued to AEP on April 7, 2021.	Reportable-3rd Party Release	377460
01-Apr-21	134-Avenue & 50-Street NW	A number of contaminants (approx. 10L) were released into a storm catch basin (CB299469) from a vehicle accident. The contaminants (gasoline, anti-freeze and motor oil) were released and contained within the catch basin sump. A 3rd party vacuum truck (GFL) was called in to remove the contaminants from the impacted CB and surrounding area. This release was reported to AEP on April 1, 2021. A written report was not required by AEP.	Reportable-3rd Party Release	377544
09-Apr-21	6600-38 Avenue NW	A public contractor (Innovative Pipeline Crossings Inc.) received laboratory results of a topsoil sample collected on April 1st from worksite grading operations. Initial analysis of the topsoil indicated elevated levels of hydrocarbons, resulting in the topsoil (approx. 150 cubic meters) being considered contaminated material and requiring special disposal. Further assessment of the soil has determined that hydrocarbon concentrations in the soil did not exceed Alberta Tier 2 criteria. As a precaution the soil has been taken to Terrapure Environmental for disposal. This release was reported to AEP on April 9, 2021 by the contractor. A written report was issued to AEP on April 13, 2021.	Reportable-3rd Party Release	377819
14-Apr-21	83-Avenue & 93-Street NW	Diesel fuel (approx. 50-150L) was released into Mill Creek from storm Outfall #116 (OF387153). EPCOR arrived on site and placed absorbent booms in Mill Creek, Outfall #116 and in 2 upstream storm manholes (MH2439854 & MH243877). EPCOR traced the source of the release to the Safeway loading dock at Bonnie Doon Shopping Mall (8330-82 Avenue NW). A fuel theft from a unit in the loading dock area had released the diesel fuel into the storm collection system. A 3rd party company (Cheema Janitorial Services Ltd) was called in by Safeway to clean the loading dock area. During the clean-up operation, Cheema pressure washed the diesel fuel into a nearby storm drain and did not prevent the fuel from migrating towards Outfall #116. A Notice to Comply was issued to Safeway Canada requiring them to report any release of restricted / prohibited waste (diesel fuel) into the storm sewerage system. A second Notice to Comply was issued to Cheema Janitorial requiring them to discontinue the release of restricted / prohibited waste (diesel fuel) into the storm sewerage system. This release was reported to AEP on April 14, 2021 by the City of Edmonton – Fire Services. A written report was issued to AEP on April 20, 2021.	Reportable-3rd Party Release	377896
15-Apr-21	7624-182 Avenue NW	Transmission oil (<5L) was released into the storm collection system from a commercial vehicle (Steam Dry Canada) leak. EPCOR arrived on scene and observed oil stains along the curbside roadway and leading into a nearby storm catch basin (CB480168). Evidence of oil was traced in the downstream storm lines leading towards the Crystallina #1 Stormwater Management Facility (930-Crystallina Nera Way NW). EPCOR checked the perimeter of the stormwater management facility and did not detect any visible hydrocarbon sheen or odour. A 3rd party vacuum truck (GFL) was called in to remove contaminants from the catch basin and the storm line leading towards the storm water management facility. A Notice to Comply was issued to Steam Dry Canada to discontinue the release of prohibited waste into the storm sewerage system. This release was reported to AEP on April 16, 2021. A written report was issued to AEP on April 22, 2021.	Reportable-3rd Party Release	377964
01-May-21	Windermere Boulevard & Currents Drive NW	Anti-freeze (approx. 10L) was released into a storm catch basin (CB438259) from a City of Edmonton - ETS bus. The release was contained within the catch basin sump and there was no release of anti-freeze into the storm collection system. A 3rd party vacuum truck (GFL) was called in to remove contaminants from the impacted catch basin and surrounding area. This release was reported to AEP on May 1, 2021 by the City of Edmonton. A written report was issued to AEP on May 3, 2021.	Reportable-3rd Party Release	378495
03-May-21	1120-105 Street NW	Glycol (approx. 10L) was released onto the driveway at EPCOR Pump Station #137 (PS449514). Absorbent material was used to clean up the spill site. There was no release of glycol to the storm / sanitary collection system. This release was reported to AEP May 3, 2021. A written report was not required by AEP.	Reportable-Internal	378525
04-May-21	12320-112 Street NW	Glycol (approx. 35L) was released into the storm collection system from an EPCOR tandem unit (V3152). The radiator on the unit cracked and leaked the glycol into a nearby storm catch basin (CB260790). Contaminated wastewater from the catch basin was then released into	Reportable-Internal	378581

		the storm collection system. Absorbent booms were placed in the downstream storm manhole (MH239421) to contain and collect any residual glycol in the storm system. A 3rd party vacuum truck (GFL) was called in to clean up the spill site and impacted storm collection system. This release was reported to AEP on May 4, 2021. A written report was issued to AEP on May 11, 2021.		
10-May-21	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for Zinc at 0.383 mg/L. The original sample from the NE district yard facility was collected on April 29, 2021 by COE Environmental Technologists. This release was reported to AEP on May 10, 2021 by the City of Edmonton. A written report was issued to AEP on May 17, 2021.	Reportable-3rd Party Release	378750
10-May-21	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for COD at 210 mg/L, Lead at 0.0265 mg/L and Zinc at 0.309 mg/L. The original sample from the NW district yard facility was collected on April 29, 2021 by COE Environmental Technologists. This release was reported to AEP on May 10, 2021 by the City of Edmonton. A written report was issued to AEP on May 17, 2021.	Reportable-3rd Party Release	378751
10-May-21	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for COD at 364 mg/L and Cadmium at 0.0084 mg/L. The original sample from the SE district yard facility was collected on April 30, 2021 by COE Environmental Technologists. This release was reported to AEP on May 10, 2021 by the City of Edmonton. A written report was issued to AEP on May 17, 2021.	Reportable-3rd Party Release	378752
12-May-21	16712-118 Avenue NW	EPCOR received laboratory results from a private storm manhole sample collected on April 30th at Hotsy Water Blast Manufacturing Inc. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 2080 mg/L, BOD at 595 mg/L, Phosphorus at 5.7 mg/L, Cadmium at 0.0017 mg/L, Copper at 0.274 mg/L, Lead at 0.125 mg/L, Nickel at 0.0903 mg/L and Zinc at 1.87 mg/L. Three Notices to Comply were issued to the company to: 1) Discontinue release of restricted waste into the sewerage system. 2) Clean and maintain private storm / sanitary flow monitoring points. 3) Provide disposal and maintenance records of private interceptors. This release was reported to AEP on May 12, 2021. A written report was issued to AEP on May 19, 2021.	Reportable-3rd Party Release	378866
17-May-21	332-Darlington Crescent NW	Paint waste (approx. 20L) was released into the storm collection system from a private residence. EPCOR observed a trail of white paint going down the street and entering a nearby storm catch basin (CB370337). Paint waste was also detected in a downstream storm manhole (MH370124). A 3rd party vacuum truck (GFL) was called in to remove contaminants from the impacted storm collection system and surrounding area. EPCOR provided education to the customer responsible for the paint release regarding proper disposal and impacts to the storm collection system. This release was reported to AEP on May 17, 2021. A written report was issued to AEP on May 21, 2021.	Reportable-3rd Party Release	379038
18-May-21	15844-111 Avenue NW	Paint waste (approx. 40L) was released into the storm collection system from a vehicle accident. A contractor vehicle (Alberta Drywall Inc.) had picked up a supply of paint and upon leaving the paint store a number of paint pails fell off the back of the contractor's truck onto the roadway. I heavy rain event at the time of the spill released paint into a nearby storm catch basin (CB255288). A 3rd party vacuum truck (GFL) was called in to remove paint waste from the impacted storm collection system and surrounding area. A Notice to Comply was issued to Alberta Drywall to discontinue the release of prohibited waste (paint) into the sewerage system. This release was reported to AEP on May 18, 2021 by the City of Edmonton – Fire Services. A written report was issued to AEP on May 21, 2021.	Reportable-3rd Party Release	379067
18-May-21	10370-Queen Elizabeth Road NW	Untreated wastewater / stormwater (unknown volume) was released into the storm collection system from EPCOR Pump Station #171 (PS372246). Due to a heavy rain event, a combination of storm water / untreated wastewater was released from PW #171 and entered the North Saskatchewan River thru Outfall #46 (OF245201). The overflow at Pump Station #171 lasted approximately 3hrs (8pm until 11pm). An EPCOR Drainage crew attended the station during the rain event to confirm that the pumps at the station were running at full capacity and as per design. This release was reported to AEP on May 18, 2021. A written report was issued to AEP on May 21, 2021.	Reportable-Internal	379073
20-May-21	90-Windermere Drive SW	Untreated wastewater (unknown volume) was released into a storm catch basin from EPCOR Pump Station #196 (PS404098). The release was contained within the sump of the catch basin (CB403809) and did not enter the storm collection system. EPCOR equipment was mobilized to remove contaminants from the impacted catch basin and surrounding area. This release was reported to AEP on May 20, 2021. A written report was issued to AEP on May 27, 2021.	Reportable-Internal	379149
25-May-21	100-Street & McDougall Hill NW	Untreated wastewater (unknown volume) was released on McDougall Hill. A blockage caused by a homeless camp using the combined sewer line to dispose of garbage at this location resulted in an overflow to ground. EPCOR equipment was mobilized and released the	Reportable-Internal	379245

		blockage which stopped the discharge to the surface. EPCOR is reviewing options to lock the manholes in this area to prevent materials from being deliberately deposited into the combined line. After the release to the surface stopped, a previously undocumented (abandoned) interconnection was found at this location. EPCOR re-abandoned this pipe on May 29, 2021. This permanently closes the interconnection between the storm and combined systems. This release was reported to AEP on May 25, 2021. A written report was issued to AEP on June 1, 2021.		
26-May-21	23-Avenue & Rabbit Hill Road NW	Untreated wastewater (unknown volume) was released into the storm collection system from a cross-connection. An unusual flow in a storm line during dry weather conditions was reported to EPCOR from a 3rd party. The sample results (E. coli at 82,000 CFU/100 mL) confirmed the presence of untreated wastewater in the storm collection system. EPCOR Drainage will continue to sample the upstream basin to locate the source of the untreated wastewater. This release was reported to AEP on May 26, 2021. A written report was issued to AEP on June 1, 2021.	Reportable-Internal	379269
27-May-21	Low Level Bridge & North Saskatchewan River NW	Untreated wastewater (unknown volume) was released from storm Outfall #47 (OF245287). The head pressure from the obstructed combined line on May 25th dislodged a plug that had previously been used to abandon the interconnection. The crew observed that an undocumented interconnection from MH245306 was flowing directly towards an adjacent storm line (PIP343099). This undocumented and previously abandoned interconnection would have allowed combined flow to enter the storm line which then leads to Outfall #4. EPCOR completed the re-abandonment of the interconnection to the storm line on May 29, 2021. This permanently closes the interconnection between the storm and combined sewer systems. This release was reported to AEP on May 27, 2021 by the Drainage Environmental Manager. A written report was issued to AEP on June 3, 2021.	Reportable-Internal	379297
10-Jun-21	107-Avenue & Groat Road NW	A concrete slurry (unknown volume) was released into the storm collection system at a private contractor (Alberco Construction Ltd.) work site. Heavy rain at the work site caused the slurry to flow into the nearby storm catch basin and in to the storm collection system. A 3rd party vacuum truck was called in to remove contaminants from the impacted storm collection system and clean the adjacent area. This release was reported to AEP on June 10, 2021 by the contractor. A written report was issued to AEP on June 15, 2021.	Reportable-3rd Party Release	379845
11-Jun-21	116-Avenue & 107-Street NW	Wastewater (unknown volume) was released into the storm collection system by a private vacuum truck (Eco Groundworks). EPCOR arrived on site and there was evidence of a water / mud mixture adjacent to a storm catch basin (CB302223) and evidence of private dumping. EPCOR equipment was called in to clean contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to Eco Groundworks to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEP on June 11, 2021. A written report was issued to AEP on June 18, 2021.	Reportable-3rd Party Release	379875
13-Jun-21	13335-127 Street NW	Polypropylene glycol (approx. 300L) was released into the sanitary collection system from a private company (NAV Canada). A valve on a boiler malfunctioned releasing the glycol into a nearby floor drain. The company used absorbent material to clean up glycol residue around the floor drain. This release was reported to AEP on June 13, 2021 by the company. A written report was not required by AEP.	Reportable-3rd Party Release	379963
18-Jun-21	394-Lessard Drive NW	A cement based product (unknown volume) was released into the storm collection system by a private contractor (Mark's Stucco & Plastering Ltd). EPCOR arrived on site and observed evidence of contaminants in a nearby storm catch basin (CB221771). A 3rd party vacuum truck (GFL) was called in to clean-up the impacted storm collection system and surrounding area. A Notice to Comply was issued to the contractor to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEP on June 18, 2021. A written report was issued to AEP on June 25, 2021.	Reportable-3rd Party Release	380141
25-Jun-21	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Cadmium at 0.020 mg/L. The original sample from the NE district yard was collected on June 16, 2021 by COE Environmental Technologists. This release was reported to AEP on June 25, 2021 by the City of Edmonton. A written report was issued to AEP on July 2, 2021.	Reportable-3rd Party Release	380398
25-Jun-21	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at 49,000 CFU/100mL and Cadmium at 0.002 mg/L. The original sample from the NW district yard was collected on June 16, 2021 by COE Environmental Technologists. On June 29th a second sample was collected from the NW district yard and analyzed to verify the initial E.coli exceedance results. Test results from this second sample (E.coli at 80 CFU/100mL) confirmed that the initial sample was cross-contaminated. This release was reported to AEP on June 25, 2021 by the City of Edmonton. A written report was issued to AEP on July 2, 2021.	Reportable-3rd Party Release	380399

25-Jun-21	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 517 mg/L, Cadmium at 0.013 mg/L and E.coli at 290 CFU/100mL. The original sample from the SE district yard was collected on June 17, 2021 by COE Environmental Technologists. This release was reported to AEP on June 25, 2021 by the City of Edmonton. A written report was issued to AEP on July 2, 2021.	Reportable-3rd Party Release	380397
02-Jul-21	14402-114 Avenue NW	Potable water (approx. 1000L) was released into the storm collection system at the City of Edmonton NW district yard. A 3rd party contractor (Nor-Alta Environmental Services) used potable water to flush out a plugged private storm line at the NW district yard. EPCOR Drainage investigators will follow up with the City of Edmonton to ensure that proper procedures are in place to prevent further releases of chlorinated (potable) water into the storm collection system. This release was reported to AEP on July 3, 2021 by the City of Edmonton. A written report was issued to AEP on July 6, 2021.	Reportable-3rd Party Release	380737
05-Jul-21	3683-Hummingbird Way NW	Hydraulic fluid (approx. 5L) was released into a storm catch basin by a private company (Canada Cartage). The impacted storm catch basin (CB517269) releases into the Starling #1 SWMF (3708-Hummingbird Way NW). As a precaution, EPCOR placed an absorbent boom in the storm collection system to prevent any contaminants from entering downstream storm water management facility. A 3rd party vacuum truck (GFL) was called in to remove contaminants from the impacted storm collection system. This release was reported to AEP on July 7, 2021. A written report was not required by AEP.	Reportable-3rd Party Release	380925
08-Jul-21	25510-Hewes Way NW	Coolant (approx. 1L) was released from an ETS bus located at the Millwoods ETS Transit Center. The City of Edmonton cleaned-up the release with absorbent material. There was no release of coolant into the storm / sanitary collection system. This release was reported to AEP on July 8, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	380969
08-Jul-21	10517-95 Street NW	Sample results of the sanitary wastewater discharge from the City of Edmonton (COE) Central District yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix B Restricted Wastes Applicable to Sanitary and Combined Sewers for hydrocarbons at 122.4 mg/L. The original sample from the Central District yard was collected on June 29, 2021 by COE Environmental Technologists. This release was reported to AEP on July 8, 2021 by the City of Edmonton. A written report was issued to AEP on July 14, 2021.	Reportable-3rd Party Release	380956
20-Jul-21	9624-96 Street NW	A concrete slurry (approx. 10L) was released into the storm collection system by a private contractor (Ace Lang Construction Ltd.). During a routine autosampler set-up on July 23rd, EPCOR observed a dried concrete slurry originating from a residential garage and going down an asphalt alleyway and entering a storm catch basin (CB340540). Heavy rainfall on July 22nd would have flushed concrete residue from the catch basin into the storm collection system. A Notice to Comply was issued to Ace Lang Construction to discontinue the release of prohibited waste into the sewerage system and to report all spills to EPCOR/property owner. This release was reported to AEP on July 23, 2021. A written report was issued to AEP on July 26, 2021.	Reportable-3rd Party Release	381622
26-Jul-21	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Ammonia at 5.19 mg/L, COD at 1170 mg/L, Cadmium at 0.0309 mg/L and E.coli at 2500 CFU/100mL. The original sample from the SE district yard was collected on July 22, 2021 by COE Environmental Technologists. This release was reported to AEP on July 26, 2021 by the City of Edmonton. A written report was issued to AEP on August 3, 2021.	Reportable-3rd Party Release	381703
26-Jul-21	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 157 mg/L, Cadmium at 0.0025 mg/L, E.coli at 34000 CFU/100mL and Oil & Grease at 18 mg/L. The original sample from the NE district yard was collected on July 22, 2021 by COE Environmental Technologists. This release was reported to AEP on July 26, 2021 by the City of Edmonton. A written report was issued to AEP on August 3, 2021.	Reportable-3rd Party Release	381702
26-Jul-21	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 895 mg/L, Cadmium at 0.0036 mg/L, E.coli at 300 CFU/100mL and Oil & Grease at 18 mg/L. The original sample from the NW district yard was collected on July 22, 2021 by COE Environmental Technologists. This release was reported to AEP on July 26, 2021 by the City of Edmonton. A written report was issued to AEP on August 3, 2021.	Reportable-3rd Party Release	381701
27-Jul-21	18711-106 Avenue NW	Potable water (unknown volume) was released into the storm collection system at the City of Edmonton – Fire Fighter Training Center. A private contractor (Shamrock Construction) was installing piles at the Training Center when they hit an EPCOR water line resulting in the release of potable water into a nearby private storm catch basin. An EPCOR Water service crew arrived on site to shut off the water and	Reportable-3rd Party Release	381792

		complete repairs to the damaged water line. A 3rd party vacuum truck was called in to remove potable water from the impacted catch basin. The storm collection system at this location releases into the North Saskatchewan River thru Outfall #18 (OF223752). EPCOR analyzed a field sample from Outfall #18 and the sample results were non-detectable for Total Chlorine. This release was reported to AEP on July 28, 2021 by the contractor. A written report was issued to AEP on July 28, 2021.		
07-Aug-21	10977-50 Street NW	Untreated wastewater (unknown volume) was released from an EPCOR Contractor (Alberco Construction Ltd.) worksite. High flow levels in the Gold Bar Utilidor tunnel dislodged plugs on the downstream area of the worksite, allowing untreated wastewater to enter the excavation. A 3rd party vactor truck (Canessco) was called in to remove contaminants from the excavation and the pipe plugs was re-installed by the contractor. The untreated wastewater was contained within the excavation and there was no release into the storm collection system or North Saskatchewan River. This release was reported to AEP on August 7, 2021 by the contractor. A written report was issued to AEP on August 11, 2021.	Reportable-Internal	382219
07-Aug-21	111-Laurier Drive NW	A concrete slurry (unknown volume) was released into the storm collection system by a private contractor (Lafarge Canada Ltd.). Heavy rain at the contractor work site caused the slurry to enter a nearby storm catch basin (CB223870). A 3rd party vacuum truck (GFL Environmental) was mobilized to the site and removed contaminants from the impacted storm collection system and nearby roadway. A Notice to Comply was issued to Lafarge to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEP on August 9, 2021 by the contractor. A written report was issued to AEP on August 11, 2021.	Reportable-3rd Party Release	382254
13-Aug-21	7824-51 Avenue NW	Sweet-oat wash water (approx. 1000L) was released into the sanitary collection system by a private company (Ceapro Inc.). As a precaution, EPCOR inspected the storm catch basins near this facility and no evidence of a release to the storm collection system was observed. This release was reported to AEP on August 13, 2021 by the company. AEP has not requested a written report.	Reportable-3rd Party Release	382439
14-Aug-21	13315-156 Street NW	Hydrocarbons (unknown volume) were released into the storm collection system by a private company (OEM Remanufacturing). A line blockage or failed valve, caused the companies onsite water treatment facility to stop pumping. The failure of the treatment system caused an overflow of engine fluids (oil, lubricants and glycol) in their sump separator and released the contaminants into the storm collection system (MH408035). The release then entered into the nearby Mistatim Industrial #2 Stormwater Management Facility (SWM379720). On August 20th, EPCOR was notified of the release from OEM Remanufacturing. EPCOR arrived on site and installed absorbent booms in MH408035 and additional booms were installed across the channel that separates the north and south sections of the Mistatim Industrial #2 Stormwater Management Facility. Additional resources were mobilized by OEM and EPCOR to further contain the release and remove contaminants from the impacted storm collection system and the Mistatim Industrial #2 SWMF. A Notice to Comply was issued to the company to discontinue the release of prohibited waste to the sewerage system. Investigators will pursue cost recovery for the response and clean-up costs of this release. This release was reported to AEP on August 20, 2021 by the company. A written report was issued to AEP on August 27, 2021.	Reportable-3rd Party Release	382729
17-Aug-21	8535-19 Avenue NW	Cooking oil (approx. 1L) was released into a storm catch basin (MH452078) by an unknown resident. The water level in the catch basin was below the lead and the cooking oil was contained within the sump. EPCOR equipment cleaned out the contaminants from the impacted catch basin. A letter will be sent to each residence on the cul-de-sac providing education on the proper disposal of FOG (fats, oil and grease) and impacts to the storm collection system. This release was reported to AEP on August 18, 2021. AEP has not requested a written report.	Reportable-3rd Party Release	382615
18-Aug-21	5043-McLuhan Road NW	A concrete slurry (unknown volume) was released into the storm collection system by a private contractor (Flex Concrete Ltd.). EPCOR arrived on site and observed concrete residue leading from a residence to a nearby storm catch basin (MH435482). A 3rd party vacuum truck (GFL) was called in to remove contaminants from the impacted storm collection system and nearby roadway. A Notice to Comply was issued to the contractor to discontinue the release of prohibited / restricted waste into the sewerage system. This release was reported to AEP on August 18, 2021 by the contractor. AEP has not requested a written report.	Reportable-3rd Party Release	382642
18-Aug-21	15205-99 Avenue NW	Asphalt sealant (< 1L) was released into a storm catch basin by a City of Edmonton contractor (Miller Capilano). The asphalt sealant was contained within the catch basin sump (CM493133) and was removed by a 3rd party vacuum truck. A Notice to Comply was issued to the contractor to discontinue the release of prohibited waste (asphalt sealant) into the sewerage system. This release was reported to AEP on August 18, 2021 by the contractor. AEP has not requested a written report.	Reportable-3rd Party Release	382618
19-Aug-21	7311-162 Avenue NW	A concrete slurry (unknown volume) was released into a storm catch basin by a private contractor (Rapid Concrete Ltd.). EPCOR arrived on site and observed concrete residue leading from a residence to a nearby storm catch basin (CB397831). The concrete slurry was contained within the catch basin sump and was removed by a 3rd party vacuum truck (GFL). A Notice to Comply was issued to the	Reportable- 3rd Party Release	382667

		contractor to discontinue the release of prohibited waste (concrete impacted water) into the sewerage system. This release was reported to AEP by a private citizen. AEP has not requested a written report.		
22-Aug-21	11455-Saskatchewan Drive NW	Propylene glycol (approx. 2500L) was released into the sanitary collection system at the University of Alberta – Centennial Center. During repairs to a water chiller system by a contractor, a newly installed drain valve released the glycol into a nearby floor drain. As a precaution, this release was reported to the Gold Bar Wastewater Treatment Plant. A Notice to Comply was issued to the University of Alberta to discontinue the release of prohibited waste (propylene glycol) into the sewerage system. This release was reported to AEP on August 23, 2021 by the University of Alberta. A written report was issued to AEP on August 24, 2021.	Reportable-3rd Party Release	382789
23-Aug-21	South of 86-Street & Jasper Avenue NW	A combination of untreated wastewater and stormwater (3,359 cubic meters) was released from Outfall #54. The combined sewer flow rate from a heavy rain event exceeded the capacity of the North Highland Interceptor. The level sensors at RTC3 failed to measure the water level and the control gates went into a fail-safe position of 100%. The three gates would have provided storage upstream of the North Highland Interceptor, but with the gates at the fail-safe position of 100% open, no upstream storage was provided, resulting in a combined sewer overflow to the North Saskatchewan River. On August 24, 2021, EPCOR identified the issue with the sensors at RTC3. An electrician was dispatched to the site. The recalibration of the sensors is expected to prevent this issue from reoccurring. The level sensing instruments, alarms and gate control operations are undergoing further evaluation. The function of RTC3 is to provide storage and to minimize the occurrence of CSO. RTC3 will not eliminate all CSO due to storm events at this location. There will be rainfall events that continue to generate CSO at Outfall #54 and they will continue to be reported through EPCOR Drainage Services Annual Wastewater System Effluent report to Environment Canada. Unscheduled releases of untreated wastewater will continue to be reported as per provincial and federal compliance requirements and as per EPCOR Drainage Services Approval to Operate (639-03-06). This release was reported to AEP on August 24, 2021 by the Drainage Environmental Manager. A written report was issued to AEP on August 31, 2021.	Reportable-Internal	382823
24-Aug-21	13025-56 Street NW	Potable water (approx. 500L) was released into the storm collection system located at the City of Edmonton – NE District Yard. The potable water was released into a storm catch basin (CB284205) during the cleaning of a city vehicle. A communication was issued to staff at this facility in regards to washing vehicles near storm drainage systems. This release was reported to AEP on August 24, 2021 by the City of Edmonton. A written report was issued to AEP on August 31, 2021.	Reportable-3rd Party Release	382822
24-Aug-21	15830-121A Avenue NW	Sample results of the stormwater discharge from a private company (Burnco Rock Products Ltd.) were received by EPCOR. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for pH at 10.91. A Notice to Comply was issued to the company to discontinue the release of prohibited waste (pH=10.91) into the storm sewerage system. This release was reported to AEP on August 24, 2021 by the company. A written report was issued to AEP on August 31, 2021.	Reportable-3rd Party Release	382812
26-Aug-21	East of 9363-98A Street NW	Sample results from Mill Creek were received by EPCOR the results of the sample collected on August 24th exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at 690 CFU/100mL. EPCOR has completed a survey of the upstream system and was unable to identify a spill or release to the storm collection system. Based on further review of the analytical results, it was determined that the sample results are consistent with background activity and not a release of untreated wastewater. This release was reported to AEP on August 26, 2021. A written report was issued to AEP on September 2, 2021.	Reportable-Internal	382897
01-Sep-21	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Cadmium (Cd) at 0.0046 mg/L, E.coli at 500 CFU/100mL, Total Phosphorous at 6.42 mg/L, Ammonia at 2.07 mg/L, Lead at 0.031 mg/L and Total Chlorine at 0.04 mg/L. The original sample from the SE district yard was collected on August 24, 2021 by COE Environmental Technologists. This release was reported to AEP on September 1, 2021 by the City of Edmonton. A written report was issued to AEP on September 8, 2021.	Reportable-3rd Party Release	383107
01-Sep-21	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 864 mg/L, E.coli at 3500 CFU/100mL, Cadmium at 0.0024 mg/L, Arsenic at 0.065 mg/L, Chromium at 0.203 mg/L, Copper at 0.34 mg/L, Lead at 0.110 mg/L, Mercury at 0.00029 mg/L, Nickel at 0.279 mg/L and Zinc at 1.06 mg/L. The original sample from the NE district yard was collected on August 24, 2021 by COE Environmental Technologists. This release was reported to AEP on September 1, 2021 by the City of Edmonton. A written report was issued to AEP on September 8, 2021.	Reportable-3rd Party Release	383105
01-Sep-21	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at 9,000 CFU/100mL, COD at 702 mg/L, Cadmium at 0.002 mg/L, Nickel at 0.341	Reportable-3rd Party Release	383104

		mg/L, Zinc at 0.50 mg/L and Phenol at 0.006 mg/L The original sample from the NW district yard was collected on August 24, 2021 by COE Environmental Technologists. This release was reported to AEP on September 1, 2021 by the City of Edmonton. A written report was issued to AEP on September 8, 2021.		
02-Sep-21	154-Avenue & 101-Street NW	Cement residue (unknown volume) was released into the storm / sanitary collection system by the City of Edmonton (COE). EPCOR determined that prohibited wastes were being released into the sewers in the Beaumaris neighborhood from the COE renewal program. A field pH was taken and found to be around 10 which is above the storm sewer limit of 9. EPCOR completed line flushing in the area on September 3rd. EPCOR contacted the COE ENVISO coordinator for the neighborhood renewal program to discuss the release of prohibited wastes to the storm / sanitary collection systems. Investigators also mentioned that the repair and cleanup costs would be charged back to the COE. A Notice to Comply was issued to the COE to discontinue the release of prohibited wastes to the sewerage system. This release was reported to AEP on September 3, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	383170
02-Sep-21	236-Lago Lindo Crescent NW	Untreated wastewater (unknown volume) was released into the storm collection system by a homeowner. A blockage in the sanitary sewer main had flooded the basement at this location. EPCOR confirmed that the customer had pumped sewage from their flooded basement into a nearby storm catch basin (CB302381). Investigators instructed the homeowner to immediately stop the release of untreated wastewater from their basement to the storm collection system. The blockage in the sanitary sewer main was cleared by EPCOR so that the flooded basement could drain back into the sanitary sewer. A Notice to Comply was issued to the homeowner to discontinue the release of other than permitted matter into the storm collection system. This release was reported to AEP on September 2, 2021. A written report was issued to AEP on September 9, 2021.	Reportable-3rd Party Release	383144
10-Sep-21	38-Avenue & 66-Street NW	Cement residue (unknown volume) was released into the storm collection system by an EPCOR contractor (Innovative Pipeline Crossing Inc.). EPCOR collected a sample from a nearby storm catch basin (MH217349) that confirmed that the pH level (pH=9.5) exceeded Drainage bylaw limits. The contractor called in a 3rd party vacuum truck to remove contaminants from the impacted catch basin. A Notice to Comply was issued to a contractor to discontinue the release of prohibited waste (concrete and cement based products) into the storm sewerage system. This release was reported to AEP on September 10, 2021 by the contractor. A written report was issued to AEP on September 17, 2021.	Reportable-Internal	383371
14-Sep-21	74-Avenue & Saskatchewan Drive NW	In-situ soil (approx. 3 cubic meters) was released from a subsidence located upstream of Outfall 23A. A section of corrugated metal pipe that conveys storm water to Outfall 23A had corroded, causing the displacement of soil from the bank adjacent to the pipe to the North Saskatchewan River. EPCOR is in the process of drafting design drawings to complete the emergency repair. The plan is to repair and replace the section of impacted pipe and restore the impacted area. This release was reported to AEP on September 17, 2021. A written report was issued to AEP on September 23, 2021.	Reportable-Internal	383597
20-Sep-21	4737-97 Street NW	Hydraulic fluid (approx. 450L) was released onto the ground at a private company (SPM Oil & Gas). The release occurred when a hydraulic tank was being off loaded from a truck. A small amount of hydraulic fluid entered nearby private storm catch basins, but did not enter the storm collection system. A 3rd party vacuum truck (GFL Environmental) was called in to remove contaminants from the impacted private catch basins and surrounding areas. This release was reported to AEP on September 20, 2021 by the company. A written report was issued to AEP on October 1, 2021.	Reportable-3rd Party Release	383703
23-Sep-21	12233-132 Street NW	Gasoline (approx. 5L) was released into the storm collection system from a fuel theft at a private residence. EPCOR observed that the homeowner had washed gasoline residue from their garage pad / alleyway into a nearby storm catch basin (CB326128). A 3rd party vacuum truck (GFL Environmental) was called in to remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to a homeowner to discontinue the release of prohibited waste into the storm sewerage system. This release was reported to AEP on September 23, 2021. A written report was not required by AEP.	Reportable-3rd Party Release	383839
26-Sep-21	6030-50 Street NW	Vehicle fluids, fire suppression foam and water (approx. 4000L) were released into a private storm catch basin from a vehicle fire. A 3rd party vacuum truck (GFL Environmental) was called in to remove contaminants from the impacted private storm sewer system and surrounding area. There was no release of contaminants into the storm collection system. This release was reported to AEP on September 26, 2021 by City of Edmonton - Fire Services. A written report was issued to AEP on October 1, 2021.	Reportable-3rd Party Release	383935
27-Sep-21	38-Avenue & 66-Street NW	Potable water (approx. 3 cubic meters) was released into the storm collection system by an EPCOR contractor (Innovative Pipeline Crossing Inc.). A 3rd party vacuum truck (Canadian Hydrovac Ltd.) was called in to remove the water from the impacted storm collection system and surrounding area. This release was reported to AEP by the contractor. A written report was issued to AEP on October 5, 2021.	Reportable-Internal	384012
28-Sep-21	10517-95 Street NW	Contaminated water (unknown volume) was released into a private storm catch basin at the City of Edmonton – Central District Yard. A tandem truck with street sweeping debris was parked in the yard during a rain event. The precipitation washed thru the debris and a City	Reportable-3rd Party	383981

		of Edmonton employee noticed a hydrocarbon sheen on the water near the truck. EPCOR inspected the private storm catch basin in the yard and no hydrocarbon residue was observed. No further action was advised by EPCOR as it appeared that no hydrocarbons had entered the private storm collection system. This release was reported to AEP on September 28, 2021 by the City of Edmonton. A written report was not required by AEP.	Release	
30-Sep-21	43-Avenue & 111-Street NW	Approx. 100-200L of diesel fuel was released into the storm collection system from a commercial vehicle accident. Upon arrival on site, EPCOR confirmed that diesel fuel had entered the storm collection system through a nearby storm catch basin (CB330781). A 3rd party vacuum truck (GFL Environmental) was called in to remove contaminants from the impacted storm collection system and surrounding area. Investigators traced the diesel fuel release towards Outfall #2 (OF211035) located on Whitemud Creek (South of Rainbow Valley Bridge & Whitemud Drive). A network of absorbent booms / pads were installed along Whitemud Creek to contain the diesel fuel spill. EPCOR monitored this location for additional impacted water releases and mobilized resources to site to respond to clean up the hydrocarbons. Clean up has been completed. This release was reported to AEP on September 30, 2021 by City of Edmonton - Fire Services. A written report was issued to AEP on October 7, 2021.	Reportable-3rd Party Release	384094
01-Oct-21	9644-88 Avenue NW	Untreated wastewater (approx. 20L) was released into the storm collection system from a faulty diverter. The diverter is installed in a combined sewer manhole (MH315875) and is used to direct untreated wastewater away from the storm collection system during dry weather conditions. An EPCOR crew observed that the diverter had become deflected, causing a small portion of the sanitary flow to enter the CSO overflow. An EPCOR crew entered the manhole to assess what was occurring and complete a temporary repair, which stopped the release of untreated wastewater. A permanent repair of the diverter was completed on October 6, 2021. EPCOR has added the diverter to a regular inspection schedule. This release was reported to AEP on October 1, 2021. A written report was issued to AEP on October 8, 2021.	Reportable-Internal	384147
04-Oct-21	3013-66 Street NW	A concrete slurry (approx. 10L) was released into a storm catch basin by a City of Edmonton contractor (TransEd). A 3rd party vacuum truck (GFL Environmental) was mobilized to the site and removed contaminants from the impacted catch basin (CB217748) and nearby roadway. The release was contained within the catch basin sump and there was no release to the storm collection system. A Notice to Comply was issued to TransEd to discontinue the release of prohibited waste (concrete impacted wastewater) into the sewerage system. This release was reported to AEP on October 5, 2021 by the City of Edmonton. A written report was issued to AEP on October 7, 2021.	Reportable-3rd Party Release	384259
07-Oct-21	9915-Bellamy Hill NW	Untreated wastewater (unknown volume) was released into the storm collection system from a residential condo building. EPCOR arrived on site and observed untreated wastewater leading from the condo building into a nearby storm catch basin (CB244776). A 3rd party vacuum truck (Suck-U-Sump) and EPCOR equipment were called in to remove contaminants from the impacted storm collection system and nearby roadway. A Notice to Comply was issued to the property owner to provide a written report and provide evidence that the private sanitary sewer infrastructure has been repaired to prevent a similar release in the future. This release was reported to AEP on October 7, 2021 by the property owner. A written report from the property owner was requested by AEP.	Reportable-3rd Party Release	384326
11-Oct-21	12422-29A Avenue NW	Untreated wastewater (unknown volume) was released at Pump Station #104. During rehab work at the pump station by an EPCOR contractor (Alberco Construction Ltd.), a bypass pump was set-up to allow underground work to be performed at this facility. A pump failure released untreated wastewater from the pump station onto the nearby sidewalk / ground. A 3rd party vacuum truck was called-in to control the release and clean-up contaminants near the pump station. There was no release of untreated wastewater into the storm collection system. This release was reported to AEP on October 11, 2021 by the contractor. A written report was issued to AEP on October 13, 2021.	Reportable-Internal	384457
13-Oct-21	6003-92 Street NW	Untreated wastewater (unknown volume) was released into the storm collection system from a commercial building. During the routine flushing of a storm main line (PIP87968) by an EPCOR crew and a cross-connection from a nearby service connection was identified. A Notice to Comply was issued to the property owner to discontinue the release of sanitary sewage into the storm sewerage system. This release was reported to AEP on October 13, 2021. A written report was issued to AEP on October 20, 2021.	Reportable-3rd Party Release	384532
14-Oct-21	17316-87 Avenue NW	Potable water (<10L) was released into a storm catch basin by a private contractor (Marigold Infrastructure Partners) working at an LRT Construction site. EPCOR confirmed that the release was contained within the sump of the catch basin (CB235363). A field test of the chlorine levels (<0.01 mg/L Total Chlorine) in the catch basin was below Drainage bylaw limits. The low Total Chlorine level in the catch basin was due to the small release volume and the large quantity of storm water already present in the CB. The catch basin did not require cleaning. A Notice to Comply was issued to the contractor to discontinue the release of restricted waste into the storm sewerage system. This release was reported to AEP on October 14, 2021 by the contractor. A written report was issued to AEP on October 20, 2021.	Reportable-3rd Party Release	384603

15-Oct-21	5611-128 Avenue NW	EPCOR responded to a report of diesel fuel (approx. 40L) being released from a City of Edmonton vehicle located at the Kennedale Fuel Station. The release occurred on October 14th as the vehicle was leaving the fuel station. Diesel fuel leaked from a fuel container at the back of the vehicle and was released along 128-Avenue NW. City of Edmonton - Fire Rescue Services responded to the incident and assisted City of Edmonton crews with the cleanup of the spill site using absorbent booms/pads. Investigators checked EPCOR's storm sewer manholes & catch basins in the area and determined that there was no release of diesel fuel into the storm collection system. This release was reported to AEP by the City of Edmonton. A written report was issued to AEP on October 21, 2021.	Reportable-3rd Party Release	384592
21-Oct-21	116-Avenue & 147-Street NW	Results of a stormwater sample collected on October 18th from a storm manhole (MH274843) were received by EPCOR. The analytical results of the sample (E. coli at 240,000 CFU/100ml) indicated a cross-connection in the upstream storm collection system. Investigators have confirmed that a nearby business has a cross-connection that is releasing untreated wastewater into the storm collection system. A Notice to Comply has been issued to Pats Drive Line Ltd. (14715-116 Avenue NW) to investigate, locate and repair sanitary wastewater discharching to the storm sewer system. This release was reported to AEP on October 21, 2021. A written report was not requested by AEP.	Reportable-3rd Party Release	384831
27-Oct-21	16630-50 Street NW	Motor oil (approx. 1000L) was released into a private storm catch basin by a waste management company (Safety-Kleen Canada). The release occurred during a routine used oil collection at a Jiffy Lube. Waste oil from the spill entered the nearby storm collection system (MH446684) and migrated downstream to the Brintnell SWMF#1 (SWM443265). A 3rd party environmental company (Clean Harbours) was called to the spill site to remove contaminants from the impacted storm collection system and provide emergency response support. City of Edmonton – Fire Services and EPCOR equipment was mobilized to assist in the clean-up of the storm collection system and the Brintnell SWMF. On October 28th, Stantec Inc. was retained by EPCOR to assess wildlife impacts and to install wildlife deterrents to prevent migratory birds from landing on the impacted section of the Brintnell SWMF. A Notice to Comply has been issued to the waste management company to discontinue the release of prohibited waste into the sewerage system. The Notice to Comply also requires the waste management company to ensure that controls are in place to prevent the release of prohibited waste into the sewerage system during storage, transportation and all associated operations. This release was reported to AEP on October 27, 2021 by Safety-Kleen. A written report was issued to AEP on November 2, 2021.	Reportable-3rd Party Release	385020
02-Nov-21	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Ammonia at 1.61 mg/L, COD at 609 mg/L, Cadmium at 0.0029 mg/L and E.coli at 240 CFU/100mL. The original sample from the SE district yard was collected on October 25, 2021 by COE Environmental Technologists. This release was reported to AEP on November 2, 2021 by the City of Edmonton. A written report was issued to AEP on November 9, 2021.	Reportable-3rd Party Release	385193
02-Nov-21	11402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 166 mg/L. The original sample from the NW district yard was collected on October 25, 2021 by COE Environmental Technologists. This release was reported to AEP on November 2, 2021 by the City of Edmonton. A written report was issued to AEP on November 9, 2021.	Reportable-3rd Party Release	385191
02-Nov-21	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for COD at 343 mg/L, E. coli at 1100 CFU/100mL, Lead at 0.0226 mg/L and Zinc at 0.440 mg/L. The original sample from the NE district yard was collected on October 25, 2021 by COE Environmental Technologists. This release was reported to AEP on November 2, 2021 by the City of Edmonton. A written report was issued to AEP on November 9, 2021.	Reportable-3rd Party Release	385194
10-Nov-21	14942-23 Avenue NW	Coolant (approx. 1L) was released into a private storm catch basin from an ETS bus located at the Leger Transit Center. A 3rd party vacuum truck (GFL Environmental) was called in to remove contaminants from the impacted catch basin and surrounding area. The release was contained within the private catch basin and there was no release to the storm collection system. This release was reported to AEP on November 10, 2021 by the City of Edmonton. A written report was not required by AEP.	Reportable-3rd Party Release	385450
29-Nov-21	5824-96 Street NW	Hydraulic fluid (approx. 10L) was released into a private storm catch basin from a metals recycling truck (General Recycling Ltd.). A mechanical failure on the truck released the hydraulic oil, which spilled onto the ground and then migrated into a nearby catch basin. On November 30th, the release was reported to EPCOR by the property manager (TNB Enterprises). EPCOR arrived on site and observed that the hydraulic oil in the sump of the catch basin was at the level of the outlet pipe. A 3rd party vacuum truck (GFL Environmental) was mobilized to the site and removed contaminants from the impacted catch basin and surrounding area. Investigators checked the nearest	Reportable-3rd Party Release	385980

		downstream storm manhole (MH230884) and did not observe any contaminants. This release was reported to AEP on November 30, 2021 by the property manager. A written report was not required by AEP.		
01-Dec-21	4950-137 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system (PIP359894) from a Real Canadian Superstore. EPCOR arrived on site and observed untreated wastewater surcharging from a private sanitary manhole and releasing into a nearby private storm catch basin. A 3rd party vacuum truck was called in to release the blockage and remove contaminants from the impacted storm collection system. This release was reported to AEP on December 1, 2021 by the store manager. A written report was issued to AEP on December 8, 2021.	Reportable-3rd Party Release	386115
26-Dec-21	2704-17 Street NW	Propylene glycol (approx. 1700L) was released into the private storm sewer system at the City of Edmonton – Meadows Recreation Centre. This release was reported to EPCOR on January 4, 2022. EPCOR arrived on site and confirmed that the glycol was contained within the private system and there was no release into the storm collection system. A 3rd party vacuum truck (Nor-Alta) was called in to remove the glycol contaminants from the private collection system. A Notice to Comply was issued to the City of Edmonton for failure to report the glycol spill immediately after becoming aware of the release. This release was reported to AEP by the City of Edmonton. A written report was issued to AEP on January 11, 2022.	Reportable-3rd Party Release	386808
29-Dec-21	606-Michener Park NW	EPCOR responded to a report of a private sanitary manhole surcharging (unknown volume) at the University of Alberta – Michener Park residence. EPCOR arrived on site and observed untreated wastewater surcharging from a private sanitary manhole and releasing into a nearby private storm catch basin. EPCOR equipment was dispatched to the site and removed contaminants from the impacted storm collection system, but were unable to clear the blockage in the private sanitary line. Construction activity on-site at the University of Alberta was determined to have been partially responsible for blockages (soil, concrete and debris) in the sanitary / storm sewer lines in the area. A 3rd party company cleared the obstruction and repaired impacted sewer lines. A Notice to Comply was issued to the University of Alberta to discontinue the release of prohibited waste (soil/construction debris) into the sewerage system. The Notice also requires the University of Alberta to maintain sanitary and storm drainage lines on their property and to protect them during construction activities. This release was reported to AEP on December 29, 2021 by the University of Alberta. A written report was issued to AEP on January 4, 2022.	Reportable-3rd Party Release	386700

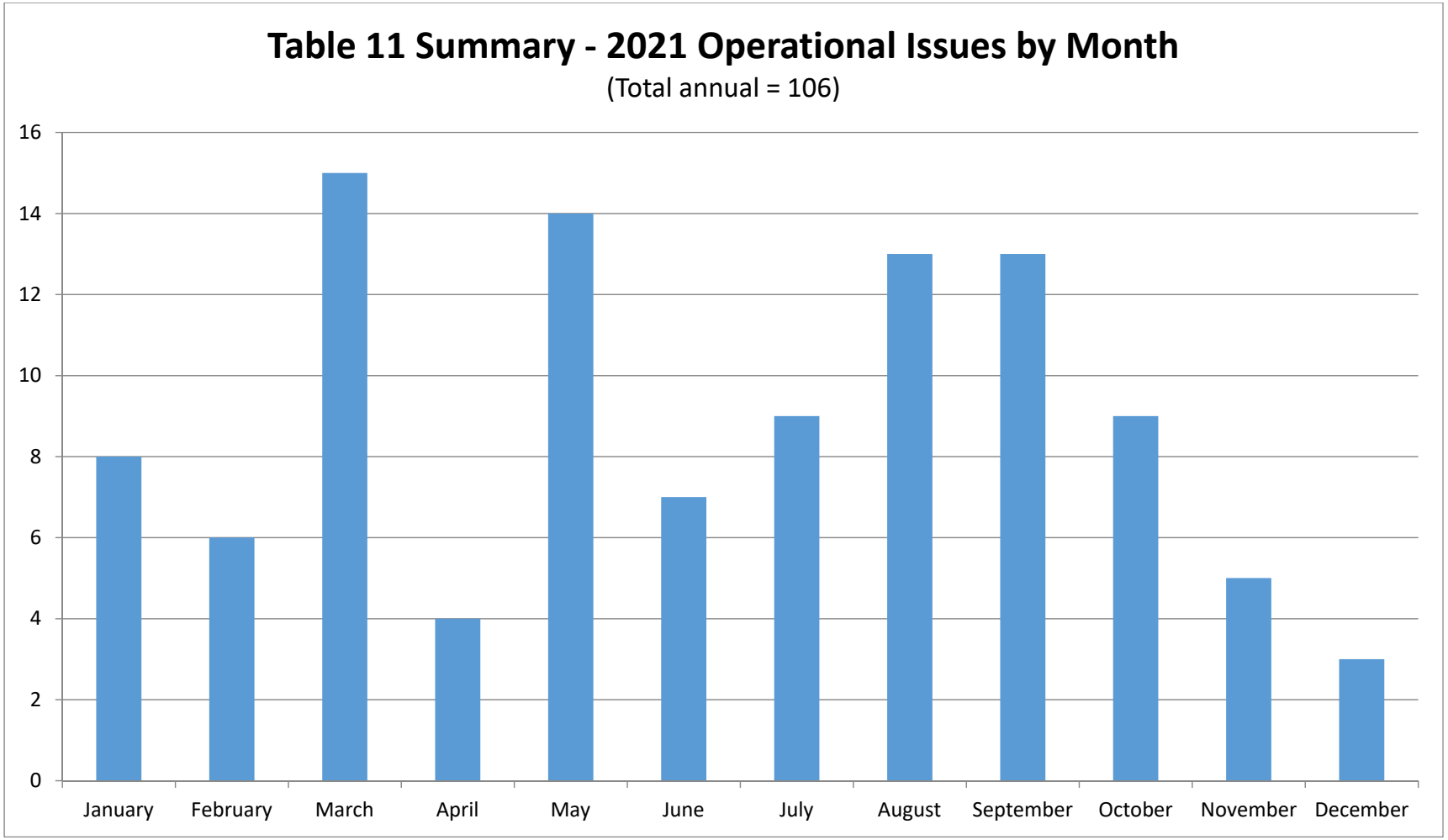


Table 11 Summary - 2021 Operational Issues by Month
(Total annual = 106)
16
14
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December

Appendices

Appendix A – Monthly Plant Performance Reports

Gold Bar Wastewater Treatment Plant
Plant Performance Report

January 2021

Digested Sludge: Total Monthly Volume (ML)	67.9

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Fri-01	319.7	0.0	225.7	0.0	0.0	11.0	0.0	214.7	214.7
Sat-02	365.1	0.0	228.6	0.0	0.0	10.8	0.0	217.8	217.8
Sun-03	339.7	0.0	234.3	0.0	0.0	10.8	0.0	223.5	223.5
Mon-04	324.2	0.0	243.3	0.0	0.0	11.0	0.0	232.3	232.3
Tue-05	326.9	0.0	236.6	0.0	0.0	10.9	0.0	225.7	225.7
Wed-06	323.2	0.0	247.4	0.0	0.0	10.9	0.0	236.5	236.5
Thu-07	322.9	0.0	235.6	0.0	0.0	11.8	0.0	223.8	223.8
Fri-08	317.3	0.0	231.2	0.0	0.0	10.2	0.0	221.0	221.0
Sat-09	345.8	0.0	240.1	0.0	0.0	9.4	0.0	230.7	230.7
Sun-10	457.9	0.0	242.3	0.0	0.0	9.3	0.0	233.0	233.0
Mon-11	452.4	0.0	246.2	0.0	0.0	9.6	0.0	236.6	236.6
Tue-12	344.2	0.0	238.9	0.0	0.0	11.7	0.0	227.2	227.2
Wed-13	332.1	0.0	237.6	0.0	0.0	11.5	0.0	226.1	226.1
Thu-14	374.2	0.0	239.3	0.0	0.0	11.0	0.0	228.3	228.3
Fri-15	320.6	0.0	240.3	0.0	0.0	11.2	0.0	229.1	229.1
Sat-16	391.4	0.0	234.2	0.0	0.0	11.6	0.0	222.6	222.6
Sun-17	424.2	0.0	241.4	0.0	0.0	10.7	0.0	230.7	230.7
Mon-18	396.3	0.0	247.0	0.0	0.0	10.7	0.0	236.3	236.3
Tue-19	324.9	0.0	236.7	0.0	0.0	10.4	0.0	226.3	226.3
Wed-20	395.1	0.0	237.6	0.0	0.0	10.4	0.0	227.2	227.2
Thu-21	345.7	0.0	237.5	0.0	0.0	12.2	0.0	225.3	225.3
Fri-22	314.5	0.0	235.9	0.0	0.0	13.0	0.0	222.9	222.9
Sat-23	337.7	0.0	235.0	0.0	0.0	13.2	0.0	221.8	221.8
Sun-24	342.9	0.0	239.2	0.0	0.0	11.8	0.0	227.4	227.4
Mon-25	324.3	0.0	244.5	0.0	0.0	11.8	0.0	232.7	232.7
Tue-26	333.3	0.0	239.8	0.0	0.0	11.8	0.0	228.0	228.0
Wed-27	327.8	0.0	238.5	0.0	0.0	11.7	0.0	226.8	226.8
Thu-28	327.4	0.0	241.0	0.0	0.0	11.8	0.0	229.2	229.2
Fri-29	317.2	0.0	243.5	0.0	0.0	11.3	0.0	232.2	232.2
Sat-30	331.1	0.0	238.6	0.0	0.0	11.3	0.0	227.3	227.3
Sun-31	346.6	0.0	243.6	0.0	0.0	11.7	0.0	231.9	231.9
Average	348.0	0.0	238.8	0.0	0.0	11.2	0.0	227.6	227.6
Minimum	314.5	0.0	225.7	0.0	0.0	9.3	0.0	214.7	214.7
Maximum	457.9	0.0	247.4	0.0	0.0	13.2	0.0	236.6	236.6
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,401	0	0	347	0	7,055	7,055

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10: FEC
Fri-01	7.6			7.5
Sat-02	7.7			7.6
Sun-03	7.6			7.9
Mon-04	7.5			7.7
Tue-05	7.5			7.8
Wed-06	7.6			7.7
Thu-07	7.5			7.5
Fri-08	7.4			7.6
Sat-09	7.5			7.5
Sun-10	7.7			7.5
Mon-11	7.5			7.5
Tue-12	7.5			7.6
Wed-13	7.5			7.5
Thu-14	7.5			7.6
Fri-15	7.5			7.5
Sat-16	7.7			7.6
Sun-17	7.6			7.6
Mon-18	7.5			7.5
Tue-19	7.4			7.6
Wed-20	7.5			7.7
Thu-21	7.5			7.5
Fri-22	7.8			7.6
Sat-23	7.4			7.6
Sun-24	7.4			7.6
Mon-25	7.5			7.8
Tue-26	7.8			7.6
Wed-27	7.4			7.5
Thu-28	7.6			7.5
Fri-29	7.5			7.5
Sat-30	7.8			7.6
Sun-31	7.5	---	---	7.6
Average	7.5	---	---	7.6
Minimum	7.4	---	---	7.5
Maximum	7.8	---	---	7.9
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEEPS	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE
Fri-01	268				3.0	3.0
Sat-02	296				3.3	3.3
Sun-03	300				2.9	2.9
Mon-04	304				3.1	3.1
Tue-05	316				2.7	2.7
Wed-06	240				3.0	3.0
Thu-07	320				3.7	3.7
Fri-08	272				3.3	3.3
Sat-09	300				2.7	2.7
Sun-10	308				3.1	3.1
Mon-11	348				4.6	4.6
Tue-12	288				2.8	2.8
Wed-13	348				2.6	2.6
Thu-14	300				3.3	3.3
Fri-15	384				2.6	2.6
Sat-16	300				2.6	2.6
Sun-17	344				2.4	2.4
Mon-18	268				2.3	2.3
Tue-19	352				2.7	2.7
Wed-20	312				3.1	3.1
Thu-21	320				2.6	2.6
Fri-22	324				2.1	2.1
Sat-23	336				2.2	2.2
Sun-24	324				2.5	2.5
Mon-25	292				2.9	2.9
Tue-26	260				3.5	3.5
Wed-27	352				3.4	3.4
Thu-28	276				3.5	3.5
Fri-29	372				3.4	3.4
Sat-30	396				2.7	2.7
Sun-31	312	---	---	---	3.3	3.3
Average	314	---	---	---	3.0	3.0
Minimum	240	---	---	---	2.1	2.1
Maximum	396	---	---	---	4.6	4.6
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5/cBOD_5 (mg/L): OUTFALL 30	BOD_5/cBOD_5 (mg/L): OUTFALL 20	BOD_5/cBOD_5 (mg/L): EPEEPS	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FEC	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FE
Fri-01	307				3.0	3.0
Sat-02	361				6.0	6.0
Sun-03	325				4.0	4.0
Mon-04	317				2.0	2.0
Tue-05	328				2.0	2.0
Wed-06	292				2.0	2.0
Thu-07	351				< 2.0	2.0
Fri-08	314				2.0	2.0
Sat-09	296				2.0	2.0
Sun-10	302				< 2.0	2.0
Mon-11	323				2.0	2.0
Tue-12	348				< 2.0	2.0
Wed-13	358				2.0	2.0
Thu-14	357				3.0	3.0
Fri-15	382				< 2.0	2.0
Sat-16	336				2.0	2.0
Sun-17	409				3.0	3.0
Mon-18	278				2.0	2.0
Tue-19	244				3.0	3.0
Wed-20	192				2.0	2.0
Thu-21	283				< 2.0	2.0
Fri-22	236				3.0	3.0
Sat-23	361				< 2.0	2.0
Sun-24	205				3.0	3.0
Mon-25	188				2.0	2.0
Tue-26	359				2.0	2.0
Wed-27	270				2.0	2.0
Thu-28	290				2.0	2.0
Fri-29	326				2.0	2.0
Sat-30	328				3.0	3.0
Sun-31	259	---	---	---	2.0	2.0
Average	307	---	---	---	2.4	2.4
Minimum	188	---	---	---	< 2.0	2.0
Maximum	409	---	---	---	6.0	6.0
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEEPS	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE
Fri-01	7.18				0.21	0.21
Sat-02	7.24				0.18	0.18
Sun-03	6.31				0.17	0.17
Mon-04	6.25				0.16	0.16
Tue-05	6.67				0.18	0.18
Wed-06	6.45				0.21	0.21
Thu-07	7.30				0.21	0.21
Fri-08	7.61				0.25	0.25
Sat-09	8.82				0.24	0.24
Sun-10	7.95				0.24	0.24
Mon-11	8.33				0.24	0.24
Tue-12	8.11				0.20	0.20
Wed-13	8.42				0.20	0.20
Thu-14	8.04				0.20	0.20
Fri-15	6.71				0.20	0.20
Sat-16	8.75				0.18	0.18
Sun-17	8.02				0.19	0.19
Mon-18	7.40				0.17	0.17
Tue-19	7.45				0.19	0.19
Wed-20	6.91				0.18	0.18
Thu-21	6.54				0.16	0.16
Fri-22	6.68				0.18	0.18
Sat-23	7.27				0.18	0.18
Sun-24	6.82				0.18	0.18
Mon-25	6.60				0.18	0.18
Tue-26	8.15				0.20	0.20
Wed-27	7.85				0.22	0.22
Thu-28	7.67				0.25	0.25
Fri-29	8.11				0.24	0.24
Sat-30	8.92				0.21	0.21
Sun-31	7.54	---	---	---	0.23	0.23
Average	7.49	---	---	---	0.20	0.20
Minimum	6.25	---	---	---	0.16	0.16
Maximum	8.9	---	---	---	0.25	0.25
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 30	NH3-N (mg/L): OUTFALL 20	NH3-N (mg/L): EPEEPS	NH3-N (mg/L): OUTFALL 10: FEC	NH3-N (mg/L): OUTFALL 10: FE
Fri-01	39.5				0.60	0.60
Sat-02	37.8				0.63	0.63
Sun-03	32.5				0.57	0.57
Mon-04	34.8				0.48	0.48
Tue-05	38.3				0.31	0.31
Wed-06	39.4				0.76	0.76
Thu-07	41.4				1.41	1.41
Fri-08	34.4				1.52	1.52
Sat-09	36.2				1.25	1.25
Sun-10	23.8				1.73	1.73
Mon-11	44.3				0.98	0.98
Tue-12	44.0				0.41	0.41
Wed-13	44.1				0.70	0.70
Thu-14	42.4				1.20	1.20
Fri-15	45.5				1.10	1.10
Sat-16	45.7				1.09	1.09
Sun-17	43.8				1.33	1.33
Mon-18	41.1				1.42	1.42
Tue-19	37.7				0.26	0.26
Wed-20	39.2				0.22	0.22
Thu-21	35.3				0.24	0.24
Fri-22	34.0				0.23	0.23
Sat-23	34.5				0.50	0.50
Sun-24	37.7				0.91	0.91
Mon-25	36.0				0.87	0.87
Tue-26	41.0				1.48	1.48
Wed-27	37.2				1.54	1.54
Thu-28	42.6				1.56	1.56
Fri-29	41.4				1.51	1.51
Sat-30	42.9				1.62	1.62
Sun-31	42.2	---	---	---	1.86	1.86
Average	39.1	---	---	---	0.98	0.98
Minimum	23.8	---	---	---	0.22	0.22
Maximum	45.7	---	---	---	1.86	1.86
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10: FEC
Fri-01	58.8			2.10
Sat-02	58.9			1.90
Sun-03	53.6			2.00
Mon-04	49.7			1.80
Tue-05	53.2			1.70
Wed-06	51.6			1.90
Thu-07	56.0			3.20
Fri-08	61.0			3.00
Sat-09	62.6			3.10
Sun-10	63.2			3.40
Mon-11	63.6			2.40
Tue-12	59.8			1.60
Wed-13	62.8			1.90
Thu-14	57.3			2.40
Fri-15	54.5			2.50
Sat-16	63.0			2.40
Sun-17	61.4			2.80
Mon-18	56.2			2.70
Tue-19	56.4			1.80
Wed-20	54.5			1.40
Thu-21	53.0			1.50
Fri-22	51.1			1.40
Sat-23	54.6			1.80
Sun-24	55.0			2.30
Mon-25	56.0			2.30
Tue-26	60.9			2.90
Wed-27	58.0			2.90
Thu-28	56.8			2.90
Fri-29	58.1			2.80
Sat-30	62.2			3.10
Sun-31	57.0	---	---	3.30
Average	57.4	---	---	2.36
Minimum	49.7	---	---	1.40
Maximum	63.6	---	---	3.40
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10: FEC
Fri-01				7.33
Sat-02				9.07
Sun-03				10.0
Mon-04				9.6
Tue-05				8.7
Wed-06	< 0.03			9.5
Thu-07				9.58
Fri-08				9.37
Sat-09				9.6
Sun-10				9.86
Mon-11				9.9
Tue-12				9.9
Wed-13	0.02			10.3
Thu-14				10.50
Fri-15				11.20
Sat-16				11.10
Sun-17				11.6
Mon-18				10.9
Tue-19				8.9
Wed-20	0.05			8.7
Thu-21				8.4
Fri-22				7.9
Sat-23				8.0
Sun-24				7.0
Mon-25				7.8
Tue-26				7.7
Wed-27	0.02			9.4
Thu-28				9.6
Fri-29				10.20
Sat-30				8.94
Sun-31		---	---	9.72
Average	0.03	---	---	9.4
Minimum	< 0.02	---	---	7.00
Maximum	0.05	---	---	11.6
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10: FEC
Fri-01	81			95
Sat-02	82			85
Sun-03	82			86
Mon-04	90			85
Tue-05	86			93
Wed-06	95			92
Thu-07	83			94
Fri-08	81			93
Sat-09	79			93
Sun-10	72			84
Mon-11	80			78
Tue-12	86			89
Wed-13	111			93
Thu-14	98			116
Fri-15	99			113
Sat-16	90			106
Sun-17	147			98
Mon-18	174			153
Tue-19	111			166
Wed-20	100			125
Thu-21	93			117
Fri-22	95			101
Sat-23	84			95
Sun-24	81			88
Mon-25	92			85
Tue-26	93			96
Wed-27	99			102
Thu-28	109			115
Fri-29	108			120
Sat-30	98			115
Sun-31	94	---	---	109
Average	96	---	---	103
Minimum	72	---	---	78
Maximum	174	---	---	166
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW	*E. coli* (Counts/100 mL): OUTFALL 30	*E. coli* (Counts/100 mL): OUTFALL 20	*E. coli* (Counts/100 mL): OUTFALL 10: FEC
				1
				2
				3
				< 1
				6
				1
				1
				3
				1
				1
				< 1
				1
	2.3			1
				4
				1
				2
				1
				3
				2
				1
				2
				6
				< 1
				1
				3
	1.5			2
				3
				1
		---	---	4
	1.5	---	---	< 1
	2.3	---	---	6
	1.9	---	---	2
	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	0	0	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
EP	Alberta Environment & Parks

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Senior Manager, Operations

Daniel Calcines B.Sc., P. Chem
Manager, Laboratory Customer Relations

Gold Bar Wastewater Treatment Plant
Plant Performance Report
February 2021

Digested Sludge: Total Monthly Volume (ML)	62.2

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent	Effluent					
			Non UV Disinfected			UV Disinfected		
		INFs	OUTFALL 30	OUTFALL 20	MPW	EPE/PS	OUTFALL 10	
		RAW					FEC	FE
Mon-01	331.1	0.0	0.0	0.0	11.7	0.0	234.3	234.3
Tue-02	319.8	0.0	0.0	0.0	11.9	0.0	226.4	226.4
Wed-03	321.8	0.0	0.0	0.0	12.1	0.0	226.8	226.8
Thu-04	311.6	0.0	0.0	0.0	12.2	0.0	224.6	224.6
Fri-05	304.0	0.0	0.0	0.0	12.6	0.0	224.1	224.1
Sat-06	321.4	0.0	0.0	0.0	12.6	0.0	223.9	223.9
Sun-07	331.0	0.0	0.0	0.0	12.3	0.0	229.8	229.8
Mon-08	317.2	0.0	0.0	0.0	12.2	0.0	229.8	229.8
Tue-09	326.1	0.0	0.0	0.0	12.1	0.0	232.8	232.8
Wed-10	331.6	0.0	0.0	0.0	11.9	0.0	227.2	227.2
Thu-11	314.0	0.0	0.0	0.0	11.5	0.0	236.0	236.0
Fri-12	306.7	0.0	0.0	0.0	11.1	0.0	233.8	233.8
Sat-13	329.6	0.0	0.0	0.0	10.7	0.0	230.4	230.4
Sun-14	326.8	0.0	0.0	0.0	10.5	0.0	230.3	230.3
Mon-15	342.3	0.0	0.0	0.0	10.6	0.0	234.0	234.0
Tue-16	321.7	0.0	0.0	0.0	10.7	0.0	239.1	239.1
Wed-17	331.4	0.0	0.0	0.0	10.9	0.0	237.4	237.4
Thu-18	344.7	0.0	0.0	0.0	11.0	0.0	236.3	236.3
Fri-19	326.9	0.0	0.0	0.0	10.8	0.0	241.6	241.6
Sat-20	351.4	0.0	0.0	0.0	10.6	0.0	241.0	241.0
Sun-21	403.5	0.0	0.0	0.0	10.5	0.0	251.3	251.3
Mon-22	495.1	0.0	0.0	0.0	9.9	0.0	264.7	264.7
Tue-23	343.4	0.0	0.0	0.0	10.8	0.0	247.7	247.7
Wed-24	348.9	0.0	0.0	0.0	10.9	0.0	244.4	244.4
Thu-25	415.9	0.0	0.0	0.0	11.1	0.0	249.9	249.9
Fri-26	333.2	0.0	0.0	0.0	11.1	0.0	240.6	240.6
Sat-27	333.5	0.0	0.0	0.0	10.7	0.0	234.1	234.1
Sun-28	348.1	0.0	0.0	0.0	11.0	0.0	236.7	236.7
Average	340.5	0.0	0.8	0.0	11.3	0.0	236.0	236.0
Minimum	304.0	0.0	0.0	0.0	9.9	0.0	223.9	223.9
Maximum	495.1	0.0	0.0	0.0	12.6	0.0	264.7	264.7
GeoMean	---	---	---	---	---	---	---	---
TOTAL	---	0	6,946	21	0	316	0	6,609	6,609

Liquid Stream Quality

DATE	pH@25°C				TSS (mg/L)					BOD$_5$/cBOD$_5$ (mg/L)						TP (mg/L)					NH3-N (mg/L)					TKN (mg/L)				NO$_3$+NO$_2$ (mg/L)				Chloride (mg/L)				*E. coli* (Counts/100 mL)			
	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPE/PS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPE/PS	OUTFALL 10 FEC	OUTFALL 10 FE	RAW	OUTFALL 30	OUTFALL 20	EPE/PS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPE/PS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10
				FEC					FE	BOD$_5$	BOD$_5$	BOD$_5$	BOD$_5$	cBOD$_5$	cBOD$_5$					FEC				FE				FEC							FEC							FEC
Mon-01				7.5					4.3	340				2.0	2.0	8.32				0.28	34.6				1.96	64.7			3.90				8.23	108			99				3
Tue-02				7.5					3.3	291				3.0	3.0	8.14				0.28	38.4				1.45	65.9			3.50				8.54	110			107				6
Wed-03				7.6					3.1	294				< 2.0	2.0	7.31				0.24	37.2				0.93	58.2			2.40	0.09			7.6	108			109				2
Thu-04				7.7					3.7	332				3.0	3.0	7.00				0.23	37.6				1.16	56.8			2.70				7.0	115			109				< 1
Fri-05				7.7					2.8	324				2.0	2.0	7.63				0.24	34.0				1.15	63.9			3.00				7.0	100			110				4
Sat-06				7.5					3.2	442				2.0	2.0	7.92				0.23	37.2				1.78	66.9			3.40				5.7	89			106				2
Sun-07				7.5					3.1	332				2.0	2.0	7.60				0.23	37.3				2.50	65.3			4.50				6.28	87			90				4
Mon-08				7.5					4.8	311				2.0	2.0	6.54				0.27	36.9				2.28	55.5			4.20				5.81	83			80				5
Tue-09				7.6					5.2	285				2.0	2.0	7.21				0.24	36.6				2.13	59.1			4.10				5.5	85			85				8
Wed-10				7.5					5.1	291				3.0	3.0	7.05				0.27	39.9				2.52	58.4			4.30	0.07			5.30	87			86				4
Thu-11				7.9					6.0	334				3.0	3.0	6.97				0.30	35.0				2.78	56.7			4.60				5.2	84			90				4
Fri-12				7.6					3.5	329				< 2.0	2.0	6.77				0.27	23.2				2.79	57.1			4.70				5.1	85			87				690
Sat-13				7.6					3.0	342				2.0	2.0	6.76				0.21	35.9				2.63	58.1			4.40				5.3	85			86				4
Sun-14				7.6					2.6	310				2.0	2.0	7.15				0.22	34.5				2.94	59.2			4.90				5.53	74			79				4
Mon-15				7.6					3.3	332				2.0	2.0	6.87				0.23	37.8				3.17	60.7			5.00				5.89	85			79				7
Tue-16				7.6					4.2	350				3.0	3.0	6.91				0.21	36.0				3.13	58.5			5.40				6.22	85			80				4
Wed-17				7.5					3.0	305				2.0	2.0	7.34				0.20	35.6				2.77	53.4			4.70	0.11			5.9	92			89				3
Thu-18				7.6					2.8	325				3.0	3.0	7.22				0.19	35.5				2.82	58.6			4.90				6.1	98			94				1
Fri-19				7.6					2.9	353				2.0	2.0	6.97				0.20	35.7				2.62	53.8			4.30				5.4	110			99				1
Sat-20				7.6					3.9	365				2.0	2.0	6.68				0.36	34.9				2.70	45.3			4.20				4.9	143			86				4
Sun-21				7.6	316	162			9.0	269				13.0	13.0	6.62				0.58	58.0	31.1	3.0		3.01	54.6			6.00				5.4	212			145				5
Mon-22	7.4	7.4		7.6	364	436			5.6	286	180			3.0	3.0	6.08	5.26			0.37	37.0	29.6	32.5		5.11	50.1	45.3		7.40		0.19		3.8	354	509		227		1.6		4
Tue-23				7.5	316				3.2	372				3.0	3.0	6.9				0.19	33.6				3.50	55.0			5.00				4.0	152			276	1.2			6
Wed-24				7.6	352				6.0	281				3.0	3.0	6.14				0.29	33.5				2.89	49.3			4.60	0.01			4.4	132			171				6
Thu-25				7.5	464				27.2	262				10.0	10.0	6.46				1.18	30.7				2.75	47.9			7.80				4.6	170			147	2.0			12
Fri-26				7.7	324				9.7	337				4.0	4.0	7.49				0.50	33.9				3.44	57.0			6.00				4.4	114			157				6
Sat-27				7.6	272				3.4	296				2.0	2.0	7.24				0.20	31.2				3.23	56.6			6.10				4.5	99			122				6
Sun-28				7.6	332				3.1	262				2.0	2.0	6.77				0.19	33.6				3.20	54.8			6.00				5.6	132			106				3
Average	7.5	7.4	---	7.6	323	299	---	---	5.0	320	180	---	---	3.1	3.1	7.07	5.26	---	---	0.30	34.7	17.7	---	---	2.62	57.2	45.3	---	4.71	0.07	0.19	---	5.7	117	509	---	114	---	---	---	---
Minimum	7.4	7.4	---	7.5	264	162	---	---	2.6	262	180	---	---	< 2.0	2.0	6.08	5.26	---	---	0.19	23.2	3.0	---	---	0.93	45.3	45.3	---	2.40	0.01	0.19	---	3.84	74	509	---	79	1.2	1.6	---	< 1
Maximum	7.7	7.4	---	7.9	464	436	---	---	27.2	442	180	---	---	13.0	13.0	8.3	5.26	---	---	1.18	39.9	32.5	---	---	5.11	66.9	45.3	---	7.80	0.11	0.19	---	8.5	354	509	---	276	2.0	1.6	---	690
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.5	1.6	---	5
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
8	8	100%	8	8	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
' 'SP	Alberta Environment & Parks

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Daniel Calcines B.Sc., P. Chem
Manager, Laboratory Customer Relations

Gold Bar Wastewater Treatment Plant
Plant Performance Report
March 2021

Digested Sludge: Total Monthly Volume (ML)	66.3

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Mon-01	499.6	0.0	254.5	0.0	0.0	11.2	0.0	243.3	243.3
Tue-02	355.6	0.0	259.9	0.0	0.0	12.0	0.0	247.9	247.9
Wed-03	447.4	0.0	274.7	10.7	0.0	12.0	0.0	252.0	252.0
Thu-04	499.5	0.0	284.1	13.4	0.0	11.5	0.0	259.2	259.2
Fri-05	601.4	0.0	320.2	51.4	0.0	11.7	0.0	257.1	257.1
Sat-06	419.8	0.0	272.6	0.2	0.0	12.2	0.0	260.2	260.2
Sun-07	470.8	0.0	275.9	18.7	0.0	11.7	0.0	245.5	245.5
Mon-08	344.4	0.0	265.4	0.0	0.0	11.5	0.0	253.9	253.9
Tue-09	397.3	0.0	254.8	0.0	0.0	11.6	0.0	243.2	243.2
Wed-10	308.5	0.0	249.2	0.0	0.0	11.7	0.0	237.5	237.5
Thu-11	307.8	0.0	249.4	0.0	0.0	11.1	0.0	238.3	238.3
Fri-12	486.0	0.0	279.8	22.2	0.0	11.2	0.0	246.4	246.4
Sat-13	602.6	0.0	318.1	60.7	0.0	10.4	0.0	247.0	247.0
Sun-14	476.4	0.0	284.9	32.0	0.0	10.0	0.0	242.9	242.9
Mon-15	354.9	0.0	271.3	0.0	0.0	10.5	0.0	260.8	260.8
Tue-16	323.7	0.0	258.7	0.0	0.0	10.8	0.0	247.9	247.9
Wed-17	336.9	0.0	263.6	0.0	0.0	11.5	0.0	252.1	252.1
Thu-18	316.4	0.0	260.7	0.0	0.0	11.5	0.0	249.2	249.2
Fri-19	328.6	0.0	263.8	0.0	0.0	11.5	0.0	252.3	252.3
Sat-20	318.0	0.0	251.9	0.0	0.0	11.2	0.0	240.7	240.7
Sun-21	315.6	0.0	251.0	0.0	0.0	11.2	0.0	239.8	239.8
Mon-22	309.4	0.0	263.9	0.0	0.0	10.8	0.0	253.1	253.1
Tue-23	307.4	0.0	249.1	0.0	0.0	10.8	0.0	238.3	238.3
Wed-24	482.1	0.0	263.7	11.7	0.0	11.0	0.0	241.0	241.0
Thu-25	313.9	0.0	246.2	0.0	0.0	10.9	0.0	235.3	235.3
Fri-26	319.7	0.0	252.3	0.0	0.0	11.0	0.0	241.3	241.3
Sat-27	318.1	0.0	245.4	0.0	0.0	10.8	0.0	234.6	234.6
Sun-28	310.3	0.0	246.1	0.0	0.0	10.6	0.0	235.5	235.5
Mon-29	306.5	0.0	254.3	0.0	0.0	10.5	0.0	243.8	243.8
Tue-30	305.2	0.0	247.3	0.0	0.0	11.0	0.0	236.3	236.3
Wed 31	308.5	0.0	242.9	0.0	0.0	11.1	0.0	231.8	231.8
Average	380.4	0.0	263.7	7.1	0.0	11.2	0.0	245.4	245.4
Minimum	305.2	0.0	242.9	0.0	0.0	10.0	0.0	231.8	231.8
Maximum	602.6	0.0	320.2	60.7	0.0	12.2	0.0	260.8	260.8
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,176	221	0	347	0	7,608	7,608

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEEPS	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE
Mon-01	7.5			7.6	400				2.8	2.8
Tue-02	7.4			7.6	320				3.5	3.5
Wed-03	7.4	7.4		7.7	336	101			3.0	3.0
Thu-04	7.5	7.6		7.6	505	80			2.3	2.3
Fri-05	7.4	7.4		7.5	464	94			2.4	2.4
Sat-06	7.5	7.9		7.4	412	53			7.0	7.0
Sun-07	7.6	7.4		7.6	268	69			9.8	9.8
Mon-08	7.5			7.6	280				7.6	7.6
Tue-09	7.3			7.5	332				24.4	24.4
Wed-10	7.4			7.6	336				9.2	9.2
Thu-11	7.5			7.5	348				5.1	5.1
Fri-12	7.5	7.4		7.4	328	51			19.4	19.4
Sat-13	7.5	7.5		7.4	304	99			6.2	6.2
Sun-14	7.5	7.4		7.4	268	97			3.0	3.0
Mon-15	7.5			7.5	288				2.0	2.0
Tue-16	7.5			7.6	308				2.4	2.4
Wed-17	7.4			7.5	308				2.9	2.9
Thu-18	7.5			7.4	320				2.5	2.5
Fri-19	7.4			7.5	324				2.4	2.4
Sat-20	7.5			7.7	296				1.9	1.9
Sun-21	7.5			7.5	332				2.4	2.4
Mon-22	7.4			7.5	348				2.7	2.7
Tue-23	7.4			7.6	332				4.2	4.2
Wed-24	7.4	7.5		7.5	352	73			3.7	3.7
Thu-25	7.4			7.4	336				2.7	2.7
Fri-26	7.5			7.4	480				3.2	3.2
Sat-27	7.5			7.5	308				3.3	3.3
Sun-28	7.7			7.6	296				3.0	3.0
Mon-29	7.4			7.6	292				3.1	3.1
Tue-30	7.5			7.6	283				5.7	5.7
Wed 31	7.6			7.5	272				2.7	2.7
Average	7.5	7.5	---	7.5	335	80	---	---	5.0	5.0
Minimum	7.3	7.4	---	7.4	268	51	---	---	1.9	1.9
Maximum	7.7	7.9	---	7.7	505	101	---	---	24.4	24.4
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5/cBOD_5 (mg/L): OUTFALL 30	BOD_5/cBOD_5 (mg/L): OUTFALL 20	BOD_5/cBOD_5 (mg/L): EPEEPS	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FEC	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEEPS	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE
Mon-01	307				2.0	2.0	6.38				0.20	0.20
Tue-02	281				2.0	2.0	6.54				0.23	0.23
Wed-03	300	154			3.0	3.0	6.81	4.20			0.19	0.19
Thu-04	368	145			< 2.0	2.0	8.11	3.96			0.19	0.19
Fri-05	349	143			< 2.0	2.0	6.44	3.71			0.18	0.18
Sat-06	299	120			4.0	4.0	5.96	2.33			0.33	0.33
Sun-07	367	179			4.0	4.0	5.85	4.01			0.47	0.47
Mon-08	310				4.0	4.0	5.96				0.44	0.44
Tue-09	328				7.0	7.0	5.96				0.90	0.90
Wed-10	281				4.0	4.0	5.85				0.47	0.47
Thu-11	298				2.0	2.0	7.12				0.26	0.26
Fri-12	325	133			6.0	6.0	6.18	3.81			0.67	0.67
Sat-13	293	127			< 2.0	2.0	6.20	4.33			0.28	0.28
Sun-14	244	152			< 2.0	2.0	5.81	4.70			0.15	0.15
Mon-15	281				< 2.0	2.0	6.36				0.18	0.18
Tue-16	313				2.0	2.0	7.01				0.20	0.20
Wed-17	317				< 2.0	2.0	6.47				0.16	0.16
Thu-18	315				2.0	2.0	6.68				0.18	0.18
Fri-19	348				< 2.0	2.0	7.58				0.18	0.18
Sat-20	274				< 2.0	2.0	7.16				0.19	0.19
Sun-21	326				2.0	2.0	7.14				0.19	0.19
Mon-22	316				< 2.0	2.0	7.30				0.18	0.18
Tue-23	317				3.0	3.0	7.5				0.27	0.27
Wed-24	318	180			2.0	2.0	7.56	5.47			0.22	0.22
Thu-25	296				2.0	2.0	7.17				0.24	0.24
Fri-26	338				< 2.0	2.0	8.50				0.19	0.19
Sat-27	300				2.0	2.0	7.43				0.18	0.18
Sun-28	291				2.0	2.0	7.47				0.20	0.20
Mon-29	311				3.0	3.0	7.29				0.22	0.22
Tue-30	340				2.0	2.0	8.62				0.20	0.20
Wed 31	332				4.0	4.0	7.29				0.20	0.20
Average	312	148	---	---	2.7	2.7	6.89	4.06	---	---	0.27	0.27
Minimum	244	120	---	---	< 2.0	2.0	5.81	2.33	---	---	0.15	0.15
Maximum	368	180	---	---	7.0	7.0	8.6	5.47	---	---	0.90	0.90
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 30	NH3-N (mg/L): OUTFALL 20	NH3-N (mg/L): EPEEPS	NH3-N (mg/L): OUTFALL 10: FEC	NH3-N (mg/L): OUTFALL 10: FE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10
Mon-01	34.2				3.96	3.96	51.4			5.40
Tue-02	33.5				3.64	3.64	46.4			5.60
Wed-03	32.7	36.3			3.39	3.39	49.5	46.3		5.50
Thu-04	33.0	36.6			4.02	4.02	58.3	41.0		5.10
Fri-05	33.2	28.4			4.27	4.27	48.8	33.9		5.40
Sat-06	32.1	26.0			4.08	4.08	48.7	29.4		5.60
Sun-07	36.1				4.50	4.50	48.6			7.50
Mon-08	34.2				6.29	6.29	48.5			10.0
Tue-09	31.4				5.84	5.84	45.4			8.30
Thu-11	37.3				5.52	5.52	54.8			6.90
Fri-12	26.5	33.7			3.04	3.04	50.3	41.8		6.80
Sat-13	29.1	28.8			3.45	3.45	48.9	39.2		5.40
Sun-14	23.3	31.8			2.96	2.96	47.9	44.6		4.30
Mon-15	32.7				4.10	4.10	51.2			5.40
Tue-16	33.8				4.92	4.92	55.0			6.20
Wed-17	32.2				2.50	2.50	51.8			4.40
Thu-18	32.8				2.78	2.78	50.9			4.10
Fri-19	32.3				3.22	3.22	58.1			4.80
Sat-20	17.8				2.77	2.77	58.3			4.40
Sun-21	36.3				2.75	2.75	60.5			4.20
Mon-22	34.6				3.97	3.97	58.5			5.60
Tue-23	12.3				5.44	5.44	57.2			7.20
Wed-24	33.7	41.6			5.49	5.49	58.6	51.5		6.70
Thu-25	35.3				4.44	4.44	55.0			5.80
Fri-26	29.1				4.59	4.59	65.6			6.60
Sat-27	36.4				3.78	3.78	56.7			5.80
Sun-28	35.7				3.34	3.34	60.1			5.00
Mon-29	34.5				3.43	3.43	55.9			5.30
Tue-30	34.5				2.93	2.93	67.6			4.80
Wed 31	7.9				2.32	2.32	58.0			4.20
Average	30.9	32.6	---	---	3.98	3.98	54.0	40.7	---	5.79
Minimum	7.9	26.0	---	---	2.32	2.32	45.4	29.4	---	4.10
Maximum	37.3	41.6	---	---	6.29	6.29	67.6	51.5	---	10.00
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10	*E. coli* (Counts/100 mL): RAW	*E. coli* (Counts/100 mL): OUTFALL 30	*E. coli* (Counts/100 mL): OUTFALL 20	*E. coli* (Counts/100 mL): OUTFALL 10
Mon-01				5.06	394			162				10
Tue-02				4.78	234			366				10
Wed-03	0.03	0.14		4.8	177	298		301		1.2		11
Thu-04		0.09		4.4	163	229		178	2.2	25.1		7
Fri-05		0.18		4.2	183	228		187		15.4		9
Sat-06		0.11		3.7	132	185		191		0.7		4
Sun-07		0.02		4.14	108	141		153		1.1		5
Mon-08				4.52	106			125				5
Tue-09				3.3	106			116				13
Wed-10	0.04			3.77	96			119				9
Thu-11				6.0	105			106				8
Fri-12		0.18		8.4	114	155		102		0.9		6
Sat-13		0.27		7.4	119	136		118		1.0		4
Sun-14		0.24		7.54	118	143		121		1.9		1
Mon-15				8.48	100			120				1
Tue-16				9.49	90			107				5
Wed-17	0.06			9.6	87			100				2
Thu-18				10.2	88			100	1.1			2
Fri-19				10.8	90			104				4
Sat-20				11.0	77			105				7
Sun-21				11.4	78			94				6
Mon-22				11.0	69			86				3
Tue-23				10.6	75			88				7
Wed-24	0.31	2.12		9.8	124	230		95		2.3		7
Thu-25				9.1	98			140	1.4			20
Fri-26				10.2	87			107				8
Sat-27				8.8	82			97				11
Sun-28				9.4	78			89				6
Mon-29				9.01	95			92				3
Tue-30				8.31	82			98				9
Wed 31	0.03			7.85	89			94				11
Average	0.09	0.37	---	7.6	118	194	---	131	---	---	---	---
Minimum	0.03	0.02	---	3.30	69	136	---	86	1.1	0.7	---	1
Maximum	0.31	2.12	---	11.4	394	298	---	366	2.2	25.1	---	20
GeoMean	---	---	---	---	---	---	---	---	1.5	2.2	---	6
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
51	51	100%	59	59	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Senior Manager, Operations

Daniel Calcines B.Sc., P. Chem
Manager, Laboratory Customer Relations

Gold Bar Wastewater Treatment Plant
Plant Performance Report
April 2021

Digested Sludge: Total Monthly Volume (ML)	68.6

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Thu-01	305.9	0.0	244.1	0.0	0.0	11.3	0.0	232.8	232.8
Fri-02	308.8	0.0	240.1	0.0	0.0	10.3	0.0	229.8	229.8
Sat-03	307.4	0.0	237.9	0.0	0.0	10.7	0.0	227.2	227.2
Sun-04	318.4	0.0	240.8	0.0	0.0	10.3	0.0	230.5	230.5
Mon-05	324.4	0.0	248.2	0.0	0.0	10.8	0.0	237.4	237.4
Tue-06	321.7	0.0	248.2	0.0	0.0	10.4	0.0	237.8	237.8
Wed-07	312.2	0.0	247.4	0.0	0.0	10.7	0.0	236.7	236.7
Thu-08	315.2	0.0	247.2	0.0	0.0	10.8	0.0	236.4	236.4
Fri-09	311.9	0.0	246.8	0.0	0.0	12.1	0.0	234.7	234.7
Sat-10	359.6	0.0	257.6	0.0	0.0	12.2	0.0	245.4	245.4
Sun-11	408.2	0.0	285.7	0.0	0.0	12.1	0.0	273.6	273.6
Mon-12	325.4	0.0	266.3	0.0	0.0	12.1	0.0	254.2	254.2
Tue-13	303.2	0.0	251.5	0.0	0.0	11.6	0.0	239.9	239.9
Wed-14	295.2	0.0	241.0	0.0	0.0	11.0	0.0	230.0	230.0
Thu-15	296.3	0.0	247.4	0.0	0.0	11.4	0.0	236.0	236.0
Fri-16	293.6	0.0	246.4	0.0	0.0	11.5	0.0	234.9	234.9
Sat-17	302.6	0.0	241.2	0.0	0.0	11.7	0.0	229.5	229.5
Sun-18	442.5	0.0	303.0	12.2	0.0	11.3	0.0	279.5	279.5
Mon-19	291.4	0.0	254.5	0.0	0.0	10.0	0.0	244.5	244.5
Tue-20	288.0	0.0	245.8	0.0	0.0	9.0	0.0	236.8	236.8
Wed-21	297.2	0.0	246.7	0.0	0.0	8.7	0.0	238.0	238.0
Thu-22	290.5	0.0	242.9	0.0	0.0	8.5	0.0	234.4	234.4
Fri-23	289.2	0.0	247.5	0.0	0.0	7.0	0.0	240.5	240.5
Sat-24	301.8	0.0	242.9	0.0	0.0	6.4	0.0	236.5	236.5
Sun-25	304.0	0.0	245.0	0.0	0.0	7.1	0.0	237.9	237.9
Mon-26	302.8	0.0	248.8	0.0	0.0	6.5	0.0	242.3	242.3
Tue-27	289.9	0.0	244.0	0.0	0.0	7.8	0.0	236.2	236.2
Wed-28	298.0	0.0	245.6	0.0	0.0	6.5	0.0	239.1	239.1
Thu-29	297.3	0.0	246.1	0.0	0.0	6.5	0.0	239.6	239.6
Fri-30	291.8	0.0	245.6	0.0	0.0	6.4	0.0	239.2	239.2
Average	313.1	0.0	249.9	0.4	0.0	9.8	0.0	239.7	239.7
Minimum	288.0	0.0	237.9	0.0	0.0	6.4	0.0	227.2	227.2
Maximum	442.5	0.0	303.0	12.2	0.0	12.2	0.0	279.5	279.5
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,496	12	0	293	0	7,191	7,191

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10 FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEPS	TSS (mg/L): OUTFALL 10 FEC	TSS (mg/L): OUTFALL 10 FE
Thu-01	7.5			7.6	300				2.9	2.9
Fri-02	7.5			7.6	280				2.5	2.5
Sat-03	7.5			7.5	293				3.1	3.1
Sun-04	7.5			7.6	296				3.0	3.0
Mon-05	7.3			7.6	272				3.3	3.3
Tue-06	7.6			7.6	320				3.4	3.4
Wed-07	7.4			7.6	332				2.5	2.5
Thu-08	7.4			7.6	308				2.5	2.5
Fri-09	7.7			7.7	332				3.9	3.9
Sat-10	7.5			7.7	372				3.3	3.3
Sun-11	7.3			7.4	272				12.3	12.3
Mon-12	7.5			7.4	272				4.1	4.1
Tue-13	7.6			7.5	320				3.3	3.3
Wed-14	7.4			7.5	288				5.1	5.1
Thu-15	7.5			7.6	276				6.4	6.4
Fri-16	7.3			7.5	404				5.9	5.9
Sat-17	7.5			7.5	400				4.1	4.1
Sun-18	7.4	7.5		7.5	308	94			3.7	3.7
Mon-19	7.4			7.5	300				4.0	4.0
Tue-20	7.4			7.6	328				5.7	5.7
Wed-21	7.3			7.5	496				7.9	7.9
Thu-22	7.5			7.5	296				9.6	9.6
Fri-23	7.5			7.5	240				10.8	10.8
Sat-24	7.4			7.5	276				8.2	8.2
Sun-25	7.4			7.6	306				8.1	8.1
Mon-26	7.4			7.6	448				8.5	8.5
Tue-27	7.3			7.6	304				2.9	2.9
Wed-28	7.6			7.6	336				2.8	2.8
Thu-29	7.5			7.5	270				3.0	3.0
Fri-30	7.4			7.7	300				3.9	3.9
Average	7.4	7.5	---	7.5	318	94	---	---	5.0	5.0
Minimum	7.3	7.5	---	7.4	240	94	---	---	2.5	2.5
Maximum	7.7	7.5	---	7.7	496	94	---	---	12.3	12.3
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5: OUTFALL 30	BOD_5: OUTFALL 20	BOD_5: EPEPS	BOD_5: OUTFALL 10 FEC	BOD_5: OUTFALL 10 FE
Thu-01	254				2.0	2.0
Fri-02	305				3.0	3.0
Sat-03	269				2.0	2.0
Sun-04	302				3.0	3.0
Mon-05	264				2.0	2.0
Tue-06	284				< 2.0	2.0
Wed-07	302				2.0	2.0
Thu-08	261				2.0	2.0
Fri-09	323				3.0	3.0
Sat-10	363				3.0	3.0
Sun-11	278				7.0	7.0
Mon-12	220				3.0	3.0
Tue-13	328				3.0	3.0
Wed-14	379				3.0	3.0
Thu-15	310				3.0	3.0
Fri-16	294				3.0	3.0
Sat-17	307				3.0	3.0
Sun-18	303	142			2.0	2.0
Mon-19	329				3.0	3.0
Tue-20	339				2.0	2.0
Wed-21	358				4.0	4.0
Thu-22	356				5.0	5.0
Fri-23	349				4.0	4.0
Sat-24	322				5.0	5.0
Sun-25	268				4.0	4.0
Mon-26	313				5.0	5.0
Tue-27	354				4.0	4.0
Wed-28	314				2.0	2.0
Thu-29	305				3.0	3.0
Fri-30	217				2.0	2.0
Average	306	142	---	---	3.1	3.1
Minimum	217	142	---	---	< 2.0	2.0
Maximum	379	142	---	---	7.0	7.0
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEPS	TP (mg/L): OUTFALL 10 FEC	TP (mg/L): OUTFALL 10 FE
Thu-01	6.82				0.25	0.25
Fri-02	6.76				0.23	0.23
Sat-03	6.22				0.22	0.22
Sun-04	6.48				0.22	0.22
Mon-05	6.43				0.24	0.24
Tue-06	6.52				0.28	0.28
Wed-07	7.01				0.26	0.26
Thu-08	6.79				0.23	0.23
Fri-09	6.97				0.22	0.22
Sat-10	7.20				0.23	0.23
Sun-11	7.91				0.85	0.85
Mon-12	6.89				0.26	0.26
Tue-13	7.04				0.21	0.21
Wed-14	7.27				0.25	0.25
Thu-15	7.30				0.38	0.38
Fri-16	7.46				0.38	0.38
Sat-17	7.50				0.25	0.25
Sun-18	6.80	5.39			0.25	0.25
Mon-19	6.67				0.24	0.24
Tue-20	7.08				0.33	0.33
Wed-21	8.61				0.53	0.53
Thu-22	6.93				0.52	0.52
Fri-23	6.61				0.58	0.58
Sat-24	7.40				0.48	0.48
Sun-25	6.74				0.49	0.49
Mon-26	7.32				0.45	0.45
Tue-27	6.70				0.24	0.24
Wed-28	6.77				0.23	0.23
Thu-29	6.83				0.21	0.21
Fri-30	7.05				0.21	0.21
Average	7.00	5.39	---	---	0.32	0.32
Minimum	6.22	5.39	---	---	0.21	0.21
Maximum	8.6	5.39	---	---	0.85	0.85
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 30	NH3-N (mg/L): OUTFALL 20	NH3-N (mg/L): EPEPS	NH3-N (mg/L): OUTFALL 10 FEC	NH3-N (mg/L): OUTFALL 10 FE
Thu-01	33.2				2.36	2.36
Fri-02	33.9				2.58	2.58
Sat-03	33.8				2.33	2.33
Sun-04	34.4				2.04	2.04
Mon-05	33.1				2.69	2.69
Tue-06	35.0				1.65	1.65
Wed-07	36.7				2.15	2.15
Thu-08	37.3				2.02	2.02
Fri-09	36.3				1.95	1.95
Sat-10	37.7				2.50	2.50
Sun-11	31.1				6.20	6.20
Mon-12	31.1				5.45	5.45
Tue-13	39.9				4.77	4.77
Wed-14	30.0				4.15	4.15
Thu-15	38.9				3.99	3.99
Fri-16	28.0				2.83	2.83
Sat-17	40.2				2.41	2.41
Sun-18	26.6	25.7			4.68	4.68
Mon-19	37.8				4.68	4.68
Tue-20	37.3				5.42	5.42
Wed-21	36.1				4.89	4.89
Thu-22	38.8				5.16	5.16
Fri-23	37.6				4.73	4.73
Sat-24	39.4				5.13	5.13
Sun-25	27.6				4.27	4.27
Mon-26	36.6				5.11	5.11
Tue-27	36.2				5.14	5.14
Wed-28	35.2				4.54	4.54
Thu-29	69.8				3.98	3.98
Fri-30	34.5				3.87	3.87
Average	36.1	25.7	---	---	3.79	3.79
Minimum	26.6	25.7	---	---	1.65	1.65
Maximum	69.8	25.7	---	---	6.20	6.20
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10 FEC
Thu-01	51.2			4.00
Fri-02	53.9			4.10
Sat-03	49.7			3.50
Sun-04	48.8			3.50
Mon-05	49.7			4.50
Tue-06	52.8			3.40
Wed-07	55.3			4.10
Thu-08	55.3			3.60
Fri-09	58.2			3.80
Sat-10	59.5			3.80
Sun-11	64.4			9.40
Mon-12	57.6			7.90
Tue-13	58.7			6.20
Wed-14	59.5			6.60
Thu-15	54.6			5.90
Fri-16	61.6			4.90
Sat-17	62.6			4.60
Sun-18	47.3	42.6		6.30
Mon-19	56.5			7.90
Tue-20	54.7			7.20
Wed-21	59.7			7.30
Thu-22	57.8			7.00
Fri-23	56.9			7.90
Sat-24	56.9			7.90
Sun-25	56.6			7.50
Mon-26	57.3			6.90
Tue-27	48.9			6.20
Wed-28	53.4			5.90
Thu-29	50.6			5.60
Fri-30	54.1			5.70
Average	55.2	42.6	---	5.75
Minimum	47.3	42.6	---	3.40
Maximum	69.8	42.6	---	9.40
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10 FEC
Thu-01				8.25
Fri-02				8.14
Sat-03				8.41
Sun-04				8.93
Mon-05				7.62
Tue-06				6.42
Wed-07	0.04			7.75
Thu-08				7.10
Fri-09				7.86
Sat-10				7.33
Sun-11				6.17
Mon-12				7.56
Tue-13				10.5
Wed-14	0.06			9.24
Thu-15				11.3
Fri-16				10.6
Sat-17				11.3
Sun-18		0.10		9.51
Mon-19				10.2
Tue-20				9.78
Wed-21	0.03			9.18
Thu-22				7.54
Fri-23				7.37
Sat-24				6.20
Sun-25				5.73
Mon-26				5.64
Tue-27				5.26
Wed-28	< 0.01			5.15
Thu-29				5.27
Fri-30				5.70
Average	0.04	0.10	---	7.9
Minimum	< 0.01	0.10	---	5.14
Maximum	0.06	0.10	---	11.3
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10 FEC
Thu-01	90			95
Fri-02	83			94
Sat-03	77			89
Sun-04	81			88
Mon-05	85			85
Tue-06	98			91
Wed-07	87			96
Thu-08	84			98
Fri-09	82			93
Sat-10	104			91
Sun-11	162			142
Mon-12	87			142
Tue-13	86			107
Wed-14	90			100
Thu-15	84			98
Fri-16	83			95
Sat-17	77			92
Sun-18	107	196		100
Mon-19	83			93
Tue-20	87			91
Wed-21	84			89
Thu-22	82			91
Fri-23	76			92
Sat-24	76			88
Sun-25	76			83
Mon-26	73			85
Tue-27	89			84
Wed-28	90			92
Thu-29	84			94
Fri-30	83			91
Average	88	196	---	96
Minimum	73	196	---	83
Maximum	162	196	---	142
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW	*E. coli*: OUTFALL 30	*E. coli*: OUTFALL 20	*E. coli*: OUTFALL 10 FEC
Thu-01				8
Fri-02				10
Sat-03				4
Sun-04				9
Mon-05				15
Tue-06				14
Wed-07				12
Thu-08				10
Fri-09				11
Sat-10				15
Sun-11				72
Mon-12				95
Tue-13	1.3			17
Wed-14				12
Thu-15				25
Fri-16				15
Sat-17				17
Sun-18		1.2		16
Mon-19				25
Tue-20	1.6			13
Wed-21				30
Thu-22				9
Fri-23				15
Sat-24				10
Sun-25				15
Mon-26				8
Tue-27				3
Wed-28				4
Thu-29				4
Fri-30				8
Average	---	---	---	---
Minimum	1.3	1.2	---	3
Maximum	1.6	1.2	---	95
GeoMean	1.4	1.2	---	13
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
3	3	100%	62	62	100%

Report Comments

AEP Ref #

RAW Untreated Influent into the plant
INF Untreated wastewater from collection system
INFs Influent, screened at the Headworks Diversion Structure
PE Primary Effluent from conventional primaries
PE 30 Primary Effluent from conventional primaries discharged via Outfall 30
EPT Enhanced Primary Treatment
EPE Enhanced Primary Effluent
EPEPS Enhanced Primary Effluent Pump Station
FE Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 Combined Bypass (RAW + PE + EPE)
OUTFALL 30 Combined Bypass (INF + INFS + PE30 + EPE)
MPW Membrane Product Water (Effluent re-use water)
ML Megalitre (1,000,000 Litre)
MPN Most Probable Number
NR No Result
NS No Sample
INS Insufficient Sample
AEP Alberta Environment & Parks

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Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
May 2021

Digested Sludge: Total Monthly Volume (ML)	68.0

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Sat-01	301.3	0.0	239.3	0.0	0.0	6.6	0.0	232.7	232.7
Sun-02	302.0	0.0	240.9	0.0	0.0	6.5	0.0	234.4	234.4
Mon-03	296.0	0.0	249.8	0.0	0.0	6.7	0.0	243.1	243.1
Tue-04	301.4	0.0	241.3	0.0	0.0	7.5	0.0	233.8	233.8
Wed-05	300.8	0.0	247.5	0.0	0.0	7.6	0.0	239.9	239.9
Thu-06	300.7	0.0	246.5	0.0	0.0	6.8	0.0	239.7	239.7
Fri-07	1,051.2	0.0	271.8	24.5	0.0	6.8	0.0	240.5	240.5
Sat-08	1,129.6	0.0	635.2	330.0	0.0	6.4	0.0	298.8	298.8
Sun-09	403.5	0.0	291.9	4.9	0.0	6.6	0.0	280.4	280.4
Mon-10	311.2	0.0	272.3	0.0	0.0	6.6	0.0	265.7	265.7
Tue-11	623.3	0.0	286.5	25.6	0.0	7.2	0.0	253.7	253.7
Wed-12	309.3	0.0	249.4	0.0	0.0	6.7	0.0	242.7	242.7
Thu-13	324.2	0.0	257.6	0.0	0.0	6.6	0.0	251.0	251.0
Fri-14	333.7	0.0	259.4	0.0	0.0	6.5	0.0	252.9	252.9
Sat-15	300.8	0.0	251.3	0.0	0.0	6.5	0.0	244.8	244.8
Sun-16	302.3	0.0	252.9	0.0	0.0	6.8	0.0	246.1	246.1
Mon-17	515.7	0.0	276.1	14.4	0.0	5.9	0.0	255.8	255.8
Tue-18	1,692.7	36.0	771.2	453.1	0.0	7.1	0.0	311.0	311.0
Wed-19	1,200.3	0.0	630.9	320.4	0.0	7.7	0.0	302.8	302.8
Thu-20	448.7	0.0	344.1	15.4	0.0	5.6	0.0	323.1	323.1
Fri-21	365.9	0.0	309.6	0.0	0.0	6.7	0.0	302.9	302.9
Sat-22	319.3	0.0	277.2	0.0	0.0	5.8	0.0	271.4	271.4
Sun-23	308.5	0.0	268.5	0.0	0.0	6.5	0.0	262.0	262.0
Mon-24	341.2	0.0	280.3	0.0	0.0	6.5	0.0	273.8	273.8
Tue-25	317.0	0.0	278.5	0.0	0.0	6.4	0.0	272.1	272.1
Wed-26	310.9	0.0	263.4	0.0	0.0	6.7	0.0	256.7	256.7
Thu-27	305.7	0.0	280.3	0.0	0.0	6.0	0.0	274.3	274.3
Fri-28	542.5	0.0	287.7	14.4	0.0	5.8	0.0	267.5	267.5
Sat-29	303.0	0.0	258.1	0.0	0.0	6.6	0.0	251.5	251.5
Sun-30	303.4	0.0	259.0	0.0	0.0	6.6	0.0	252.4	252.4
Mon-31	301.5	0.0	271.2	0.0	0.0	6.5	0.0	264.7	264.7
Average	466.7	1.2	308.1	38.8	0.0	6.6	0.0	262.7	262.7
Minimum	296.0	0.0	239.3	0.0	0.0	5.6	0.0	232.7	232.7
Maximum	1692.7	36.0	771.2	453.1	0.0	7.7	0.0	323.1	323.1
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	36	9,550	1203	0	205	0	8,142	8,142

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10 FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEEPS	TSS (mg/L): OUTFALL 10 FEC	TSS (mg/L): OUTFALL 10 FE
Sat-01	7.4			7.6	204				3.3	3.3
Sun-02	7.4			7.6	420				3.5	3.5
Mon-03	7.3			7.6	300				3.7	3.7
Tue-04	7.4			7.6	320				3.4	3.4
Wed-05	7.4			7.6	432				3.8	3.8
Thu-06	7.4			7.6	348				3.5	3.5
Fri-07	7.4	7.4		7.7	572	251			3.7	3.7
Sat-08	7.3	7.4		7.4	324	113			8.4	8.4
Sun-09	7.3	7.4		7.4	264	53			10.2	10.2
Mon-10	7.5			7.5	316				4.3	4.3
Tue-11	7.4	7.6		7.6	364	108			2.6	2.6
Wed-12	7.4			7.6	272				2.3	2.3
Thu-13	7.4			7.6	380				2.7	2.7
Fri-14	7.5			7.7	368				3.7	3.7
Sat-15	7.5			7.6	320				3.9	3.9
Sun-16	7.5			7.7	316				5.1	5.1
Mon-17	7.4	7.5		7.5	420	72			5.2	5.2
Tue-18	7.3	7.3		7.5	456	202			4.7	4.7
Wed-19	7.5	7.5		7.2	325	46			2.4	2.4
Thu-20	7.5	7.5		7.5	252	22			2.7	2.7
Fri-21	7.6			7.6	244				2.2	2.2
Sat-22	7.6			7.6	276				2.8	2.8
Sun-23	7.5			7.6	226				3.4	3.4
Mon-24	7.5			7.6	276				3.2	3.2
Tue-25	7.5			7.6	267				3.9	3.9
Wed-26	7.5			7.6	256				2.3	2.3
Thu-27	7.5			7.6	312				2.4	2.4
Fri-28	7.4	7.5		7.6	344	63			2.4	2.4
Sat-29	7.5			7.5	252				2.4	2.4
Sun-30	7.5			7.6	288				2.6	2.6
Mon-31	7.4			7.6	312				2.5	2.5
Average	7.4	7.5	---	7.6	323	103	---	---	3.7	3.7
Minimum	7.3	7.3	---	7.2	204	22	---	---	2.2	2.2
Maximum	7.6	7.6	---	7.7	572	251	---	---	10.2	10.2
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5/cBOD_5 (mg/L): OUTFALL 30	BOD_5/cBOD_5 (mg/L): OUTFALL 20	BOD_5/cBOD_5 (mg/L): EPEPS	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FEC: BOD_5	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FEC: cBOD_5	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FE: BOD_5	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FE: cBOD_5
Sat-01	216				2.0	2.0		
Sun-02	332				3.0	3.0		
Mon-03	324				3.0	3.0		
Tue-04	354				2.0	2.0		
Wed-05	322				2.0	2.0		
Thu-06	331				< 2.0	2.0		
Fri-07	495	275			2.0	2.0		
Sat-08	169	91			3.0	3.0		
Sun-09	229	115			3.0	3.0		
Mon-10	308				2.0	2.0		
Tue-11	314	135			< 2.0	2.0		
Wed-12	299				< 2.0	2.0		
Thu-13	327				2.0	2.0		
Fri-14	350				3.0	3.0		
Sat-15	314				3.0	3.0		
Sun-16	333				3.0	3.0		
Mon-17	321	199			3.0	3.0		
Tue-18	205	107			2.0	2.0		
Wed-19	173	45			< 2.0	2.0		
Thu-20	204	71			< 2.0	2.0		
Fri-21	233				< 2.0	2.0		
Sat-22	242				< 2.0	2.0		
Sun-23	232				< 2.0	2.0		
Mon-24	253				2.0	2.0		
Tue-25	245				< 2.0	2.0		
Wed-26	194				< 2.0	2.0		
Thu-27	286				< 2.0	2.0		
Fri-28	246	143			< 2.0	2.0		
Sat-29	289				< 2.0	2.0		
Sun-30	202				< 2.0	2.0		
Mon-31	241				< 2.0	2.0		
Average	277	131	---	---	2.3	2.3		
Minimum	169	45	---	---	< 2.0	2.0		
Maximum	495	275	---	---	3.0	3.0		
GeoMean	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEEPS	TP (mg/L): OUTFALL 10 FEC	TP (mg/L): OUTFALL 10 FE
Sat-01	5.89				0.21	0.21
Sun-02	7.88				0.22	0.22
Mon-03	6.88				0.26	0.26
Tue-04	7.94				0.20	0.20
Wed-05	7.64				0.24	0.24
Thu-06	8.03				0.27	0.27
Fri-07	7.09	7.29			0.24	0.24
Sat-08	3.95				0.36	0.36
Sun-09	5.57	3.48			0.42	0.42
Mon-10	6.71				0.23	0.23
Tue-11	6.81	5.99			0.21	0.21
Wed-12	7.34				0.16	0.16
Thu-13	7.30				0.24	0.24
Fri-14	8.38				0.26	0.26
Sat-15	7.35				0.29	0.29
Sun-16	7.15				0.31	0.31
Mon-17	7.27	5.35			0.31	0.31
Tue-18	4.87	3.26			0.26	0.26
Wed-19	2.04	1.59			0.15	0.15
Thu-20	4.59	2.08			0.13	0.13
Fri-21	5.54				0.26	0.26
Sat-22	5.69				0.18	0.18
Sun-23	5.5				0.18	0.18
Mon-24	5.56				0.18	0.18
Tue-25	6.24				0.18	0.18
Wed-26	6.26				0.17	0.17
Thu-27	6.90				0.20	0.20
Fri-28	7.10	5.25			0.23	0.23
Sat-29	7.13				0.23	0.23
Sun-30	7.02				0.22	0.22
Mon-31	7.08				0.22	0.22
Average	6.47	4.29	---	---	0.23	0.23
Minimum	2.04	1.59	---	---	0.13	0.13
Maximum	8.4	7.29	---	---	0.42	0.42
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 30	NH3-N (mg/L): OUTFALL 20	NH3-N (mg/L): EPEEPS	NH3-N (mg/L): OUTFALL 10 FEC	NH3-N (mg/L): OUTFALL 10 FE
Sat-01	36.4				3.47	3.47
Sun-02	39.9				3.66	3.66
Mon-03	36.5				3.79	3.79
Tue-04	38.1				2.65	2.65
Wed-05	37.4				3.05	3.05
Thu-06	35.4				3.24	3.24
Fri-07	31.7	38.7			2.56	2.56
Sat-08	14.6	15.4			1.52	1.52
Sun-09	30.2	27.1			2.92	2.92
Mon-10	32.2				5.59	5.59
Tue-11	31.7	33.5			5.23	5.23
Wed-12	33.0				2.05	2.05
Thu-13	36.1				2.83	2.83
Fri-14	23.7				3.24	3.24
Sat-15	37.4				3.04	3.04
Sun-16	31.4				2.46	2.46
Mon-17	33.5	42.6			1.15	1.15
Tue-18	13.6	16.8			0.66	0.66
Wed-19	14.0	20.0			0.21	0.21
Thu-20	24.9	25.6			2.12	2.12
Fri-21	27.9				4.71	4.71
Sat-22	31.6				2.33	2.33
Sun-23	31.8				1.54	1.54
Mon-24	31.7				0.71	0.71
Tue-25	33.2				0.65	0.65
Wed-26	32.8				0.39	0.39
Thu-27	31.3				0.43	0.43
Fri-28	32.8	31.6			0.71	0.71
Sat-29	33.8				0.59	0.59
Sun-30	33.1				0.55	0.55
Mon-31	33.7				0.32	0.32
Average	31.1	27.9	---	---	2.21	2.21
Minimum	13.6	15.4	---	---	0.21	0.21
Maximum	39.9	42.6	---	---	5.59	5.59
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10 FEC
Sat-01	47.4			5.50
Sun-02	64.0			5.50
Mon-03	57.9			5.30
Tue-04	56.7			4.50
Wed-05	60.7			5.10
Thu-06	58.4			4.90
Fri-07	55.8	54.8		4.60
Sat-08	30.1			3.20
Sun-09	49.1	35.4		4.80
Mon-10	53.5			7.50
Tue-11	55.6	40.2		6.60
Wed-12	51.3			3.80
Thu-13	52.2			3.70
Fri-14	60.1			4.20
Sat-15	53.5			4.20
Sun-16	55.6			4.20
Mon-17	50.7	42.6		3.00
Tue-18	28.6	21.5		2.10
Wed-19	20.8	21.2		1.10
Thu-20	37.2	30.8		3.40
Fri-21	44.6			6.40
Sat-22	48.8			3.90
Sun-23	47.1			3.10
Mon-24	48.2			2.60
Tue-25	53.1			2.90
Wed-26	52.7			2.30
Thu-27	56.5			2.70
Fri-28	56.3	51.3		2.60
Sat-29	62.3			2.40
Sun-30	60.3			2.20
Mon-31	61.2			2.10
Average	51.3	37.2	---	3.88
Minimum	20.8	21.2	---	1.10
Maximum	64.0	54.8	---	7.50
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10 FEC
Sat-01				5.38
Sun-02				6.50
Mon-03				6.03
Tue-04				5.80
Wed-05	0.02			6.24
Thu-06				5.94
Fri-07		0.36		6.03
Sat-08		0.53		4.26
Sun-09		0.54		4.78
Mon-10				5.80
Tue-11		0.15		6.47
Wed-12	< 0.01			7.43
Thu-13				8.00
Fri-14				8.21
Sat-15				8.56
Sun-16				9.45
Mon-17		0.19		8.57
Tue-18		0.40		6.08
Wed-19	< 0.01	1.83		3.92
Thu-20		1.98		7.35
Fri-21				8.34
Sat-22				9.34
Sun-23				10.3
Mon-24				11.6
Tue-25				11.5
Wed-26	< 0.01			11.6
Thu-27				12.6
Fri-28		0.24		11.7
Sat-29				11.7
Sun-30				13.0
Mon-31				12.1
Average	0.01	0.69	---	8.2
Minimum	< 0.01	0.15	---	3.92
Maximum	0.02	1.98	---	13.0
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10 FEC
Sat-01	78			89
Sun-02	73			82
Mon-03	78			77
Tue-04	80			85
Wed-05	83			89
Thu-06	85			92
Fri-07	83	102		94
Sat-08	55	57		83
Sun-09	75	58		66
Mon-10	69			76
Tue-11	79	84		83
Wed-12	80			87
Thu-13	81			88
Fri-14	87			87
Sat-15	80			90
Sun-16	84			84
Mon-17	81	88		85
Tue-18	43	46		85
Wed-19	56	59		53
Thu-20	78	68		73
Fri-21	87			92
Sat-22	86			103
Sun-23	85			96
Mon-24	85			94
Tue-25	86			92
Wed-26	90			94
Thu-27	85			98
Fri-28	85	93		97
Sat-29	79			93
Sun-30	77			89
Mon-31	86			87
Average	78	73	---	87
Minimum	43	46	---	53
Maximum	90	102	---	103
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW X10^6	*E. coli* (Counts/100 mL): OUTFALL 30 X10^6	*E. coli* (Counts/100 mL): OUTFALL 20 X10^6	*E. coli* (Counts/100 mL): OUTFALL 10 FEC
Sat-01				9
Sun-02				2
Mon-03				4
Tue-04				6
Wed-05				2
Thu-06	2.2			7
Fri-07		1.8		6
Sat-08		0.9		7
Sun-09		1.1		6
Mon-10				9
Tue-11		1.4		2
Wed-12				6
Thu-13				2
Fri-14				8
Sat-15				2
Sun-16				6
Mon-17	1.1	1.0		11
Tue-18		1.1		12
Wed-19		0.4		3
Thu-20		1.2		8
Fri-21				17
Sat-22				27
Sun-23				13
Mon-24				9
Tue-25				14
Wed-26				4
Thu-27				16
Fri-28		1.3		11
Sat-29				32
Sun-30				6
Mon-31				12
Average	---	---	---	---
Minimum	1.1	0.4	---	2
Maximum	2.2	1.8	---	32
GeoMean	1.6	1.1	---	7
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
77	77	100%	139	139	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Senior Manager, Operations

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Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
June 2021

Digested Sludge: Total Monthly Volume (ML)	67.8

Volume of Flow (ML) and Liquid Stream Quality

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Effluent Non UV Disinfected OUTFALL 20	Effluent Non UV Disinfected MPW	Effluent UV Disinfected EPEPS	UV Disinfected OUTFALL 10 FEC	UV Disinfected OUTFALL 10 FE	pH@25°C RAW	pH@25°C OUTFALL 30	pH@25°C OUTFALL 20	pH@25°C OUTFALL 10 FEC	TSS (mg/L) RAW	TSS (mg/L) OUTFALL 30	TSS (mg/L) OUTFALL 20	TSS (mg/L) EPEPS	TSS (mg/L) OUTFALL 10 FEC	TSS (mg/L) OUTFALL 10 FE	BOD_5/$cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$
Tue-01	316.3	0.0	278.0	0.0	0.0	5.4	0.0	272.6	272.6	7.4			7.6	276				3.1	3.1	247				2.0	2.0
Wed-02	308.9	0.0	278.7	0.0	0.0	6.6	0.0	272.1	272.1	7.4			7.6	316				3.5	3.5	300				< 2.0	2.0
Thu-03	304.9	0.0	275.6	0.0	0.0	7.3	0.0	268.3	268.3	7.4			7.6	328				3.7	3.7	296				2.0	2.0
Fri-04	453.6	0.0	292.8	9.3	0.0	8.0	0.0	275.5	275.5	7.5	7.7		7.7	320	111			3.2	3.2	304	160			< 2.0	2.0
Sat-05	349.4	0.0	265.6	0.0	0.0	8.2	0.0	257.4	257.4	7.6			7.7	316				3.2	3.2	259				2.0	2.0
Sun-06	333.3	0.0	264.1	0.0	0.0	9.2	0.0	254.9	254.9	7.5			7.6	264				3.9	3.9	268				2.0	2.0
Mon-07	323.5	0.0	270.9	0.0	0.0	9.5	0.0	261.4	261.4	7.5			7.6	316				2.0	2.0	308				3.0	3.0
Tue-08	578.3	0.0	282.7	12.6	0.0	9.4	0.0	260.7	260.7	7.6	7.6		7.6	440	94			6.1	6.1	341	177			2.0	2.0
Wed-09	619.2	0.0	307.0	35.1	0.0	8.7	0.0	263.2	263.2	7.5	7.4		7.7	308	46			3.4	3.4	272	142			2.0	2.0
Thu-10	1,428.1	0.0	473.9	189.1	0.0	9.8	0.0	275.0	275.0	7.4	7.4		7.6	356	91			3.8	3.8	226	83			2.0	2.0
Fri-11	480.3	0.0	317.0	7.1	0.0	10.1	0.0	299.8	299.8	7.4	7.5		7.6	260	39			2.8	2.8	253	76			< 2.0	2.0
Sat-12	334.7	0.0	271.2	0.0	0.0	8.4	0.0	262.8	262.8	7.5			7.7	243				2.6	2.6	267				3.0	3.0
Sun-13	333.9	0.0	269.7	0.0	0.0	9.8	0.0	259.9	259.9	7.4			7.5	252				2.3	2.3	304				2.0	2.0
Mon-14	500.9	0.0	321.0	11.5	0.0	9.7	0.0	299.8	299.8	7.3	7.6		7.6	240	77			3.6	3.6	294	111			2.0	2.0
Tue-15	384.4	0.0	286.6	0.0	0.0	11.3	0.0	275.3	275.3	7.4			7.5	260				3.1	3.1	284				2.0	2.0
Wed-16	327.0	0.0	271.8	0.0	0.0	12.8	0.0	259.0	259.0	7.5			7.6	268				2.2	2.2	316				2.0	2.0
Thu-17	326.2	0.0	266.9	0.0	0.0	11.3	0.0	255.6	255.6	7.6			7.6	288				2.8	2.8	247				< 2.0	2.0
Fri-18	355.8	0.0	270.0	0.0	0.0	12.6	0.0	257.4	257.4	7.5			7.6	320				3.5	3.5	280				< 2.0	2.0
Sat-19	362.4	0.0	273.2	0.0	0.0	11.9	0.0	261.3	261.3	7.8			7.7	272				3.2	3.2	251				2.0	2.0
Sun-20	325.9	0.0	261.7	0.0	0.0	13.2	0.0	248.5	248.5	7.5			7.6	257				3.4	3.4	263				2.0	2.0
Mon-21	314.9	0.0	276.1	0.0	0.0	11.9	0.0	264.2	264.2	7.5			7.6	236				2.8	2.8	226				< 2.0	2.0
Tue-22	328.9	0.0	273.6	0.0	0.0	11.7	0.0	261.9	261.9	7.5			7.5	280				2.5	2.5	298				< 2.0	2.0
Wed-23	374.0	0.0	271.4	0.0	0.0	11.7	0.0	259.7	259.7	7.3			7.5	280				3.1	3.1	268				2.0	2.0
Thu-24	306.8	0.0	269.2	0.0	0.0	11.1	0.0	258.1	258.1	7.5			7.6	268				2.9	2.9	287				< 2.0	2.0
Fri-25	306.1	0.0	272.6	0.0	0.0	12.5	0.0	260.1	260.1	7.6			7.6	324				3.2	3.2	305				2.0	2.0
Sat-26	313.4	0.0	261.1	0.0	0.0	11.3	0.0	249.8	249.8	7.5			7.6	252				2.4	2.4	236				2.0	2.0
Sun-27	327.4	0.0	263.4	0.0	0.0	11.1	0.0	252.3	252.3	7.6			7.6	300				3.3	3.3	292				2.0	2.0
Mon-28	328.4	0.0	277.5	0.0	0.0	11.0	0.0	266.5	266.5	7.4			7.6	276				3.2	3.2	307				2.0	2.0
Tue-29	316.3	0.0	277.4	0.0	0.0	10.2	0.0	267.2	267.2	7.5			7.7	254				3.6	3.6	271				2.0	2.0
Wed-30	318.5	0.0	275.9	0.0	0.0	10.6	0.0	265.3	265.3	7.5			7.7	257				4.0	4.0	251				3.0	3.0
Average	399.4	0.0	283.9	8.8	0.0	10.2	0.0	264.9	264.9	7.5	7.6	---	7.6	288	76	---	---	3.2	3.2	277	125	---	---	2.1	2.1
Minimum	304.9	0.0	261.1	0.0	0.0	5.4	0.0	248.5	248.5	7.3	7.4	---	7.5	236	39	---	---	2.0	2.0	226	76	---	---	< 2.0	2.0
Maximum	1,428.1	0.0	473.9	189.1	0.0	13.2	0.0	299.8	299.8	7.8	7.7	---	7.7	440	111	---	---	6.1	6.1	341	177	---	---	3.0	3.0
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,517	265	0	306	0	7,946	7,946	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

DATE	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Tue-01	7.09				0.24	0.24	33.0				0.18	0.18	58.6			2.1				11.8	84			95				12
Wed-02	7.07				0.24	0.24	31.6				0.94	0.94	57.4			3.0	< 0.01			11.4	85			96				12
Thu-03	7.19				0.25	0.25	31.1				1.21	1.21	58.1			3.1				9.4	83			95				16
Fri-04	7.32	6.74			0.25	0.25	30.0	44.2			0.19	0.19	61.8	67.8		2.0		0.22		11.1	81	101		97		6.5		8
Sat-05	6.93				0.25	0.25	33.8				0.30	0.30	58.6			2.0				10.9	83			94				10
Sun-06	7.27				0.22	0.22	33.8				0.41	0.41	57.0			2.0				12.9	77			90				11
Mon-07	7.38				0.23	0.23	34.0				0.30	0.30	57.0			1.8				12.6	81			89				6
Tue-08	7.56	5.80			0.21	0.21	31.7	38.7			0.13	0.13	50.6	54.4		1.8		0.14		13.1	78	88		94		1.8		8
Wed-09	6.65	4.65			0.23	0.23	29.0	32.2			0.15	0.15	49.7	47.5		1.7	< 0.01	0.02		11.6	76	85		87		2.8		6
Thu-10	4.53	2.96			0.21	0.21	11.6	20.6			0.08	0.08	36.7	30.1		1.7		0.41		10.3	57	60		81		1.8		8
Fri-11	5.28	2.47			0.18	0.18	25.6	22.0			0.22	0.22	45.8	27.0		1.7		0.39		6.9	62	43		62		14.7		3
Sat-12	5.72				0.20	0.20	29.0				0.28	0.28	46.1			1.9				10.6	66			76				5
Sun-13	5.98				0.21	0.21	27.5				0.25	0.25	52.5			1.7				11.4	66			75				4
Mon-14	5.75	3.61			0.21	0.21	28.2	32.2			0.18	0.18	47.0	34.5		1.8		0.03		9.7	72	75		78		1.5		120
Tue-15	6.50				0.22	0.22	30.2				0.07	0.07	50.3			1.5				10.3	73			82	1.4			7
Wed-16	6.38				0.21	0.21	32.8				0.16	0.16	49.0			1.9	< 0.01			11.4	76			85				10
Thu-17	6.81				0.23	0.23	33.4				0.11	0.11	53.8			1.8				13.1	80			88				3
Fri-18	6.73				0.22	0.22	33.0				0.27	0.27	51.9			2.0				14.0	76			94				4
Sat-19	6.51				0.21	0.21	31.2				0.36	0.36	46.8			2.1				12.3	74			86				6
Sun-20	6.95				0.20	0.20	32.7				0.43	0.43	57.0			2.1				12.9	67			81				6
Mon-21	7.21				0.21	0.21	31.8				0.32	0.32	56.4			2.0				12.5	73			83				10
Tue-22	6.88				0.20	0.20	31.4				0.20	0.20	54.3			1.8				11.7	79			90	1.9			5
Wed-23	6.60				0.24	0.24	30.9				0.22	0.22	51.2			1.6	0.03			10.9	82			92				6
Thu-24	6.85				0.25	0.25	32.0				0.13	0.13	57.4			1.6				11.7	83			91				7
Fri-25	6.57				0.25	0.25	30.8				0.10	0.10	51.8			1.8				12.6	79			89				5
Sat-26	6.51				0.23	0.23	31.2				0.13	0.13	51.2			1.6				11.7	74			88				7
Sun-27	6.34				0.23	0.23	38.2				0.21	0.21	49.6			1.6				12.1	74			84				5
Mon-28	8.74				0.22	0.22	25.0				0.17	0.17	72.0			1.4				11.0	77			82				8
Tue-29	6.29				0.24	0.24	29.7				0.12	0.12	50.7			1.4				10.7	76			87				3
Wed-30	6.32				0.27	0.27	28.9				0.08	0.08	49.8			1.4	0.02			10.2	74			87				6
Average	6.66	4.37	---	---	0.23	0.23	30.4	31.7	---	---	0.26	0.26	53.0	43.6	---	1.86	0.02	0.20	---	11.4	75	75	---	87	---	---	---	---
Minimum	4.53	2.47	---	---	0.18	0.18	11.6	20.6	---	---	0.07	0.07	36.7	27.0	---	1.40	< 0.01	0.02	---	6.89	57	43	---	62	1.4	1.5	---	3
Maximum	8.7	6.74	---	---	0.27	0.27	38.2	44.2	---	---	1.21	1.21	72.0	67.8	---	3.10	0.03	0.41	---	14.0	85	101	---	97	1.9	14.7	---	120
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.6	3.3	---	7
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
25	25	100%	164	164	100%

Report Comments

AEP Ref #

RAW — Untreated Influent into the plant
INF — Untreated wastewater from collection system
INFs — Influent, screened at the Headworks Diversion Structure
PE — Primary Effluent from conventional primaries
PE 30 — Primary Effluent from conventional primaries discharged via Outfall 30
EPT — Enhanced Primary Treatment
EPE — Enhanced Primary Effluent
EPEPS — Enhanced Primary Effluent Pump Station
FE — Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC — Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 — UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 — Combined Bypass (RAW + PE + EPE)
OUTFALL 30 — Combined Bypass (INF + INFS + PE30 + EPE)
MPW — Membrane Product Water (Effluent re-use water)
ML — Megalitre (1,000,000 Litre)
MPN — Most Probable Number
NR — No Result
NS — No Sample
INS — Insufficient Sample
AEP — Alberta Environment & Parks

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
July 2021

Digested Sludge: Total Monthly Volume (ML)	67.8

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent, Non UV Disinfected: OUTFALL 30	Effluent, Non UV Disinfected: OUTFALL 20	Effluent, Non UV Disinfected: MPW	Effluent, UV Disinfected: EPEPS	Effluent, UV Disinfected: OUTFALL 10 FEC	Effluent, UV Disinfected: OUTFALL 10 FE
Thu-01	323.4	0.0	268.3	0.0	0.0	10.6	0.0	257.7	257.7
Fri-02	319.1	0.0	271.4	0.0	0.0	10.7	0.0	260.7	260.7
Sat-03	318.2	0.0	260.4	0.0	0.0	12.1	0.0	248.3	248.3
Sun-04	341.5	0.0	259.8	0.0	0.0	12.2	0.0	247.6	247.6
Mon-05	302.2	0.0	265.2	0.0	0.0	12.3	0.0	252.9	252.9
Tue-06	779.9	0.0	346.2	37.3	0.0	12.0	0.0	296.9	296.9
Wed-07	323.2	0.0	272.3	0.0	0.0	11.6	0.0	260.7	260.7
Thu-08	315.5	0.0	272.0	0.0	0.0	11.1	0.0	260.9	260.9
Fri-09	450.0	0.0	273.3	0.0	0.0	10.8	0.0	262.5	262.5
Sat-10	379.8	0.0	271.3	0.0	0.0	11.9	0.0	259.4	259.4
Sun-11	305.3	0.0	254.7	0.0	0.0	11.7	0.0	243.0	243.0
Mon-12	310.2	0.0	268.5	0.0	0.0	11.5	0.0	257.0	257.0
Tue-13	307.8	0.0	267.2	0.0	0.0	11.7	0.0	255.5	255.5
Wed-14	311.7	0.0	268.1	0.0	0.0	11.6	0.0	256.5	256.5
Thu-15	308.1	0.0	268.6	0.0	0.0	11.1	0.0	257.5	257.5
Fri-16	300.2	0.0	261.7	0.0	0.0	11.6	0.0	250.1	250.1
Sat-17	291.5	0.0	262.2	0.0	0.0	11.3	0.0	250.9	250.9
Sun-18	354.4	0.0	263.8	0.0	0.0	11.5	0.0	252.3	252.3
Mon-19	294.2	0.0	253.9	0.0	0.0	11.8	0.0	242.1	242.1
Tue-20	293.3	0.0	252.4	0.0	0.0	11.9	0.0	240.5	240.5
Wed-21	1,876.8	5.0	285.9	29.1	0.2	11.5	0.0	245.1	245.1
Thu-22	1,476.4	2.0	480.1	171.6	0.5	11.3	0.0	296.7	296.7
Fri-23	347.0	0.0	278.0	0.0	0.0	10.5	0.0	267.5	267.5
Sat-24	311.8	0.0	252.6	0.0	0.0	10.5	0.0	242.1	242.1
Sun-25	316.9	0.0	251.9	0.0	0.0	10.6	0.0	241.3	241.3
Mon-26	312.8	0.0	268.8	0.0	0.0	10.9	0.0	257.9	257.9
Tue-27	308.6	0.0	259.6	0.0	0.0	10.9	0.0	248.7	248.7
Wed-28	309.3	0.0	258.4	0.0	0.0	10.8	0.0	247.6	247.6
Thu-29	309.7	0.0	261.9	0.0	0.0	11.0	0.0	250.9	250.9
Fri-30	310.4	0.0	264.7	0.0	0.0	11.3	0.0	253.4	253.4
Sat 31	303.1	0.0	251.0	0.0	0.0	10.9	0.0	240.1	240.1
Average	423.0	0.2	274.0	7.7	0.0	11.3	0.0	255.0	255.0
Minimum	291.5	0.0	251.0	0.0	0.0	10.5	0.0	240.1	240.1
Maximum	1,876.8	5.0	480.1	171.6	0.5	12.3	0.0	296.9	296.9
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	7	8,494	238	1	351	0	7,904	7,904

Liquid Stream Quality

DATE	pH@25°C RAW	pH OUTFALL 30	pH OUTFALL 20	pH OUTFALL 10 FEC	TSS (mg/L) RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE
Thu-01	7.5			7.6	284				4.1	4.1
Fri-02	7.5			7.6	260				3.0	3.0
Sat-03	7.4			7.6	304				10.9	10.9
Sun-04	7.5			7.6	316				6.3	6.3
Mon-05	7.5			7.5	340				4.1	4.1
Tue-06	7.3	7.2		7.6	304	79			3.7	3.7
Wed-07	7.5			7.6	276				5.0	5.0
Thu-08	7.5			7.6	248				3.7	3.7
Fri-09	7.4			7.5	276				4.4	4.4
Sat-10	7.6			7.5	254				4.5	4.5
Sun-11	7.5			7.7	272				7.9	7.9
Mon-12	7.5			7.6	260				4.9	4.9
Tue-13	7.5			7.5	292				6.1	6.1
Wed-14	7.4			7.5	254				3.5	3.5
Thu-15	7.4			7.6	308				4.1	4.1
Fri-16	7.5			7.7	283				3.7	3.7
Sat-17	7.5			7.5	380				4.6	4.6
Sun-18	7.4			7.6	384				7.0	7.0
Mon-19	7.5			7.5	348				11.0	11.0
Tue-20	7.4			7.6	317				6.8	6.8
Wed-21	7.4	7.7	6.9	7.5	352	383	2740		5.2	5.2
Thu-22	7.3	7.4	7.0	7.4	568	98	303		5.5	5.5
Fri-23	7.5			7.4	356				4.1	4.1
Sat-24	7.4			7.6	272				4.1	4.1
Sun-25	7.5			7.6	266				5.8	5.8
Mon-26	7.5			7.6	284				5.9	5.9
Tue-27	7.5			7.6	264				5.8	5.8
Wed-28	7.6			7.6	296				5.9	5.9
Thu-29	7.4			7.5	240				6.1	6.1
Fri-30	7.5			7.5	264				6.1	6.1
Sat 31	7.4			7.5	248				6.1	6.1
Average	7.4	7.4	6.9	7.6	302	187	1522	---	5.5	5.5
Minimum	7.3	7.2	6.9	7.4	240	79	303	---	3.0	3.0
Maximum	7.6	7.7	7.0	7.7	568	383	2740	---	11.0	11.0
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	$BOD_5/cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE
Thu-01	225				2	2	6.29				0.26	0.26
Fri-02	185				< 2	2	8.22				0.22	0.22
Sat-03	254				3	3	6.46				0.31	0.31
Sun-04	278				3	3	6.63				0.26	0.26
Mon-05	292				< 2	2	8.54				0.27	0.27
Tue-06	326	150			< 2	2	6.53	3.30			0.24	0.24
Wed-07	260				3	3	6.96				0.34	0.34
Thu-08	208				2	2	5.03				0.24	0.24
Fri-09	253				3	3	6.16				0.23	0.23
Sat-10	280				2	2	6.58				0.24	0.24
Sun-11	288				3	3	6.48				0.24	0.24
Mon-12	281				3	3	8.34				0.30	0.30
Tue-13	301				3	3	6.47				0.33	0.33
Wed-14	312				3	3	6.51				0.28	0.28
Thu-15	269				2	2	6.83				0.25	0.25
Fri-16	308				2	2	6.54				0.27	0.27
Sat-17	335				2	2	7.05				0.30	0.30
Sun-18	287				3	3	6.42				0.38	0.38
Mon-19	302				4	4	6.80				0.51	0.51
Tue-20	291				3	3	0.60				0.41	0.41
Wed-21	334	282	178		3	3	7.46	7.61	3.50		0.28	0.28
Thu-22	248	86	102		3	3	5.59	2.86	2.51		0.31	0.31
Fri-23	230				3	3	5.4				0.28	0.28
Sat-24	251				3	3	5.90				0.27	0.27
Sun-25	222				3	3	6.12				0.32	0.32
Mon-26	310				3	3	6.23				0.30	0.30
Tue-27	253				3	3	6.32				0.34	0.34
Wed-28	289				3	3	8.06				0.34	0.34
Thu-29	296				3	3	6.61				0.36	0.36
Fri-30	234				3	3	6.79				0.38	0.38
Sat 31	302				3	3	6.61				0.37	0.37
Average	274	173	140	---	3	3	6.47	4.59	3.01	---	0.30	0.30
Minimum	185	86	102	---	< 2	2	0.60	2.86	2.51	---	0.22	0.22
Maximum	335	282	178	---	4	4	8.5	7.61	3.50	---	0.51	0.51
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC
Thu-01	28.1				0.12	0.12	48.2			1.6
Fri-02	24.9				0.17	0.17	59.9			1.8
Sat-03	29.0				0.18	0.18	47.4			2.3
Sun-04	32.4				0.17	0.17	54.1			2.0
Mon-05	26.3				0.17	0.17	63.3			1.6
Tue-06	23.5	21.7			0.14	0.14	40.2	29.3		2.0
Wed-07	29.6				0.20	0.20	52.4			2.1
Thu-08	29.7				0.19	0.19	34.7			2.0
Fri-09	30.3				0.08	0.08	51.0			2.0
Sat-10	27.8				0.17	0.17	47.0			2.1
Sun-11	30.2				0.20	0.20	53.8			1.9
Mon-12	28.9				0.13	0.13	66.7			1.8
Tue-13	30.4				0.08	0.08	48.2			1.9
Wed-14	33.6				0.10	0.10	48.6			1.6
Thu-15	29.1				0.06	0.06	49.2			1.6
Fri-16	31.1				0.10	0.10	48.8			1.6
Sat-17	30.8				0.12	0.12	45.7			1.9
Sun-18	32.8				0.48	0.48	55.4			2.4
Mon-19	30.8				0.23	0.23	52.5			2.3
Tue-20	29.7				0.22	0.22	4.4			2.1
Wed-21	28.1	29.9	10.2		0.76	0.76	50.2	53.1	21.6	2.3
Thu-22	18.4	22.6	9.9		0.45	0.45	34.5	26.6	15.9	2.5
Fri-23	30.8				0.74	0.74	40.4			2.2
Sat-24	31.7				1.03	1.03	38.8			2.8
Sun-25	31.4				0.84	0.84	50.1			2.8
Mon-26	29.7				1.24	1.24	50.1			3.4
Tue-27	30.0				0.92	0.92	50.8			2.5
Wed-28	30.9				0.71	0.71	58.3			2.5
Thu-29	30.8				0.80	0.80	44.5			2.5
Fri-30	29.2				1.08	1.08	49.5			2.9
Sat 31	30.8				1.00	1.00	49.3			2.7
Average	29.4	24.7	10.1	---	0.42	0.42	48.0	36.3	18.8	2.2
Minimum	18.4	21.7	9.9	---	0.06	0.06	4.4	26.6	15.9	1.6
Maximum	33.6	29.9	10.2	---	1.24	1.24	66.7	53.1	21.6	3.4
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Thu-01				10.0	79			85.4				2
Fri-02				11.8	76			83.3				3
Sat-03				11.2	74			85.0				8
Sun-04				13.2	73			83.2				4
Mon-05				12.5	79			82.1				32
Tue-06		0.52		9.77	68	61		83.2		4		4
Wed-07	< 0.01			10.3	75			89.8				18
Thu-08				11.4	72			90.6	2			22
Fri-09				11.8	70			88.3			< 1	12
Sat-10				13.1	66			86.4				6
Sun-11				12.3	65			80.6				4
Mon-12				12.7	69			89.0				7
Tue-13				11.3	68			85.6				14
Wed-14	0.06			11.0	66			83.8				11
Thu-15				10.2	80			81.9				19
Fri-16				9.9	72			87.8				13
Sat-17				10.9	71			84.4				17
Sun-18				10.7	71			80.8				16
Mon-19				11.7	76			79.8				22
Tue-20				8.32	70			89.3				18
Wed-21	0.02	1.25	0.37	8.87	63	58	29	81.7		4	1	7
Thu-22		0.37	0.43	5.95	44	50	28	73.4		1	1	10
Fri-23				8.41	62			64.1				26
Sat-24				10.4	61			79.4				9
Sun-25				11.4	56			76.8				18
Mon-26				10.2	63			75.4				13
Tue-27				10.2	62			77.8				19
Wed-28	0.04			10.7	66			82.8	2			16
Thu-29				10.8	70			72.6				14
Fri-30				11.3	71			80.6				17
Sat 31				11.1	62			79.2				10
Average	0.03	0.71	0.40	10.8	68	56	29	82.1	---	---	---	---
Minimum	< 0.01	0.37	0.37	5.95	44	50	28	64.1	2	1	< 1	2
Maximum	0.06	1.25	0.43	13.2	80	61	29	90.6	2	4	1	32
GeoMean	---	---	---	---	---	---	---	---	2	3	1	11
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
17	17	100%	181	181	100%

RAW Untreated Influent into the plant
INF Untreated wastewater from collection system
INFs Influent, screened at the Headworks Diversion Structure
PE Primary Effluent from conventional primaries
PE 30 Primary Effluent from conventional primaries discharged via Outfall 30
EPT Enhanced Primary Treatment
EPE Enhanced Primary Effluent
EPEPS Enhanced Primary Effluent Pump Station
FE Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 Combined Bypass (RAW + PE + EPE)
OUTFALL 30 Combined Bypass (INF + INFS + PE30 + EPE)
MPW Membrane Product Water (Effluent re-use water)
ML Megalitre (1,000,000 Litre)
MPN Most Probable Number
NR No Result
NS No Sample
INS Insufficient Sample
AEP Alberta Environment & Parks

Report Comments

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

AEP Ref #

Gold Bar Wastewater Treatment Plant
Plant Performance Report
August 2021

Digested Sludge: Total Monthly Volume (ML)	66.5

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Sun-01	298.3	0.0	244.9	0.0	0.0	10.8	0.0	234.1	234.1
Mon-02	304.0	0.0	250.3	0.0	0.0	11.2	0.0	239.1	239.1
Tue-03	418.0	0.0	267.7	0.0	0.0	10.3	0.0	257.4	257.4
Wed-04	398.4	0.0	268.8	0.0	0.0	11.4	0.0	257.4	257.4
Thu-05	309.0	0.0	262.9	0.0	0.0	10.9	0.0	252.0	252.0
Fri-06	302.6	0.0	249.9	0.0	0.0	10.9	0.0	239.0	239.0
Sat-07	1,826.1	7.0	457.2	187.2	0.3	11.1	0.0	258.6	258.6
Sun-08	336.7	0.0	282.5	0.0	0.0	9.2	0.0	273.3	273.3
Mon-09	327.0	0.0	269.9	0.0	0.0	10.6	0.0	259.3	259.3
Tue-10	312.1	0.0	257.5	0.0	0.0	11.2	0.0	246.3	246.3
Wed-11	295.3	0.0	252.8	0.0	0.0	10.4	0.0	242.4	242.4
Thu-12	284.1	0.0	257.4	0.0	0.0	11.4	0.0	246.0	246.0
Fri-13	342.1	0.0	264.2	0.0	0.0	11.4	0.0	252.8	252.8
Sat-14	300.0	0.0	253.4	0.0	0.0	11.1	0.0	242.3	242.3
Sun-15	298.2	0.0	250.0	0.0	0.0	11.3	0.0	238.7	238.7
Mon-16	324.5	0.0	272.2	0.0	0.0	11.0	0.0	261.2	261.2
Tue-17	285.6	0.0	253.3	0.0	0.0	11.3	0.0	242.0	242.0
Wed-18	297.3	0.0	256.6	0.0	0.0	10.8	0.0	245.8	245.8
Thu-19	281.5	0.0	253.2	0.0	0.0	11.2	0.0	242.0	242.0
Fri-20	314.0	0.0	258.8	0.0	0.0	11.2	0.0	247.6	247.6
Sat-21	278.1	0.0	247.2	0.0	0.0	11.4	0.0	235.8	235.8
Sun-22	333.4	0.0	248.2	0.0	0.0	10.6	0.0	237.6	237.6
Mon-23	1,027.8	0.0	555.2	202.9	0.0	10.5	0.0	341.8	341.8
Tue-24	645.9	0.0	330.1	17.7	0.0	10.4	0.0	302.0	302.0
Wed-25	316.0	0.0	264.8	0.0	0.0	10.5	0.0	254.3	254.3
Thu-26	313.8	0.0	264.0	0.0	0.0	10.3	0.0	253.7	253.7
Fri-27	302.6	0.0	258.6	0.0	0.0	10.4	0.0	248.2	248.2
Sat-28	317.2	0.0	256.3	0.0	0.0	10.3	0.0	246.0	246.0
Sun-29	317.8	0.0	256.9	0.0	0.0	10.7	0.0	246.2	246.2
Mon-30	320.6	0.0	265.9	0.0	0.0	3.2	0.0	262.7	262.7
Tue 31	316.7	0.0	258.9	0.0	0.0	2.6	0.0	256.3	256.3
Average	398.2	0.2	277.1	13.2	0.0	10.3	0.0	253.6	253.6
Minimum	278.1	0.0	244.9	0.0	0.0	2.6	0.0	234.1	234.1
Maximum	1,826.1	7.0	555.2	202.9	0.3	11.4	0.0	341.8	341.8
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	7	8,590	408	0	320	0	7,862	7,862

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10: FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEEPS	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE
Sun-01	7.5			7.6	304				6.8	6.8
Mon-02	7.5			7.6	276				9.0	9.0
Tue-03	7.5			7.6	316				9.4	9.4
Wed-04	7.4			7.6	296				8.2	8.2
Thu-05	7.4			7.6	300				7.4	7.4
Fri-06	7.6			7.5	280				6.4	6.4
Sat-07	7.3	7.3	7.0	7.5	564	125	408		6.6	6.6
Sun-08	7.3			7.4	284				8.5	8.5
Mon-09	7.5			7.5	272				13.9	13.9
Tue-10	7.4			7.6	264				6.9	6.9
Wed-11	7.4			7.5	270				6.2	6.2
Thu-12	7.4			7.5	251				6.1	6.1
Fri-13	7.6			7.6	272				7.0	7.0
Sat-14	7.5			7.5	236				5.9	5.9
Sun-15	7.5			7.5	244				7.4	7.4
Mon-16	7.4			7.5	304				5.1	5.1
Tue-17	7.5			7.6	284				5.4	5.4
Wed-18	7.5			7.5	248				3.9	3.9
Thu-19	7.5			7.6	303				4.9	4.9
Fri-20	7.4			7.6	300				5.5	5.5
Sat-21	7.5			7.5	268				5.2	5.2
Sun-22	7.5			7.6	292				6.7	6.7
Mon-23	7.3	7.3		7.4	264	26			5.1	5.1
Tue-24	7.4	7.7		7.4	312	22			4.2	4.2
Wed-25	7.4			7.6	276				4.4	4.4
Thu-26	7.4			7.8	288				4.2	4.2
Fri-27	7.5			7.6	340				4.0	4.0
Sat-28	7.5			7.5	244				3.5	3.5
Sun-29	7.5			7.6	288				4.1	4.1
Mon-30	7.5			7.5	308				5.6	5.6
Tue 31	7.4			7.6	292				5.4	5.4
Average	7.5	7.4	7.0	7.5	292	58	408	---	6.2	6.2
Minimum	7.3	7.3	7.0	7.4	236	22	408	---	3.5	3.5
Maximum	7.6	7.7	7.0	7.8	564	125	408	---	13.9	13.9
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5/cBOD_5 (mg/L): OUTFALL 30	BOD_5/cBOD_5 (mg/L): OUTFALL 20	BOD_5/cBOD_5 (mg/L): EPEEPS	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FEC	BOD_5/cBOD_5 (mg/L): OUTFALL 10: FE
Sun-01	293				3	3
Mon-02	239				3	3
Tue-03	310				4	4
Wed-04	259				5	5
Thu-05	231				4	4
Fri-06	297				3	3
Sat-07	318	97	135		3	3
Sun-08	283				3	3
Mon-09	268				3	3
Tue-10	195				3	3
Wed-11	292				3	3
Thu-12	330				3	3
Fri-13	316				4	4
Sat-14	228				3	3
Sun-15	300				4	4
Mon-16	285				3	3
Tue-17	286				3	3
Wed-18	275				3	3
Thu-19	428				3	3
Fri-20	290				3	3
Sat-21	280				3	3
Sun-22	274				3	3
Mon-23	185	60			3	3
Tue-24	242	53			3	3
Wed-25	296				2	2
Thu-26	251				3	3
Fri-27	318				3	3
Sat-28	308				3	3
Sun-29	348				3	3
Mon-30	291				3	3
Tue 31	342				3	3
Average	286	70	135	---	3	3
Minimum	185	53	135	---	2	2
Maximum	428	97	135	---	5	5
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEEPS	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE
Sun-01	6.74				0.40	0.40
Mon-02	6.51				0.47	0.47
Tue-03	6.69				0.58	0.58
Wed-04	6.52				0.89	0.89
Thu-05	7.09				0.44	0.44
Fri-06	7.29				0.48	0.48
Sat-07	6.91	3.94	2.76		0.46	0.46
Sun-08	6.23				0.40	0.40
Mon-09	6.24				0.71	0.71
Tue-10	6.34				0.41	0.41
Wed-11	6.39				0.38	0.38
Thu-12	6.10				0.39	0.39
Fri-13	6.17				0.47	0.47
Sat-14	5.63				0.40	0.40
Sun-15	6.32				0.48	0.48
Mon-16	6.13				0.40	0.40
Tue-17	6.48				0.34	0.34
Wed-18	6.79				0.33	0.33
Thu-19	6.93				0.37	0.37
Fri-20	7.04				0.37	0.37
Sat-21	6.64				0.33	0.33
Sun-22	6.61				0.29	0.29
Mon-23	3.96	1.69			0.36	0.36
Tue-24	6.03	0.65			0.28	0.28
Wed-25	6.34				0.24	0.24
Thu-26	6.78				0.27	0.27
Fri-27	6.63				0.28	0.28
Sat-28	6.43				0.26	0.26
Sun-29	6.54				0.30	0.30
Mon-30	7.05				0.31	0.31
Tue 31	6.97				0.32	0.32
Average	6.47	2.09	2.76	---	0.40	0.40
Minimum	3.96	0.65	2.76	---	0.24	0.24
Maximum	7.3	3.94	2.76	---	0.89	0.89
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH_3-N (mg/L): RAW	NH_3-N (mg/L): OUTFALL 30	NH_3-N (mg/L): OUTFALL 20	NH_3-N (mg/L): EPEEPS	NH_3-N (mg/L): OUTFALL 10: FEC	NH_3-N (mg/L): OUTFALL 10: FE
Sun-01	28.7				0.96	0.96
Mon-02	31.2				1.44	1.44
Tue-03	30.5				2.19	2.19
Wed-04	30.0				3.89	3.89
Thu-05	60.1				1.35	1.35
Fri-06	30.7				1.39	1.39
Sat-07	17.5	23.8	11.9		0.47	0.47
Sun-08	30.0				0.64	0.64
Mon-09	31.6				1.34	1.34
Tue-10	30.2				0.74	0.74
Wed-11	31.5				0.15	0.15
Thu-12	30.2				0.37	0.37
Fri-13	29.0				1.61	1.61
Sat-14	28.8				2.38	2.38
Sun-15	30.4				0.81	0.81
Mon-16	28.7				0.42	0.42
Tue-17	31.0				0.18	0.18
Wed-18	31.0				0.33	0.33
Thu-19	32.5				0.23	0.23
Fri-20	34.1				0.37	0.37
Sat-21	27.2				0.33	0.33
Sun-22	36.6				0.48	0.48
Mon-23	17.0	22.9			0.17	0.17
Tue-24	19.3	24.1			0.42	0.42
Wed-25	33.4				0.64	0.64
Thu-26	27.5				0.45	0.45
Fri-27	33.2				0.40	0.40
Sat-28	32.9				0.82	0.82
Sun-29	33.6				1.52	1.52
Mon-30	34.8				1.19	1.19
Tue 31	34.3				0.59	0.59
Average	30.9	23.6	11.9	---	0.91	0.91
Minimum	17.0	22.9	11.9	---	0.15	0.15
Maximum	60.1	24.1	11.9	---	3.89	3.89
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10: FEC
Sun-01	47.0			2.4
Mon-02	50.7			3.8
Tue-03	52.2			4.6
Wed-04	49.5			6.6
Thu-05	54.5			3.4
Fri-06	54.5			3.3
Sat-07	44.3	34.1	15.0	2.3
Sun-08	45.4			2.5
Mon-09	52.5			3.7
Tue-10	49.9			2.5
Wed-11	46.9			1.7
Thu-12	46.8			3.4
Fri-13	45.7			1.9
Sat-14	39.5			4.0
Sun-15	43.8			2.2
Mon-16	46.8			2.3
Tue-17	54.6			2.1
Wed-18	50.2			1.9
Thu-19	46.8			1.8
Fri-20	57.2			2.1
Sat-21	53.6			2.0
Sun-22	54.8			2.4
Mon-23	28.0	29.3		1.7
Tue-24	41.9	28.0		1.7
Wed-25	47.8			2.3
Thu-26	49.8			2.2
Fri-27	56.9			3.4
Sat-28	52.0			2.5
Sun-29	70			3.2
Mon-30	60.9			3.2
Tue 31	59.8			2.6
Average	49.6	30.5	15.0	2.7
Minimum	28.0	28.0	15.0	1.7
Maximum	60.9	34.1	15.0	6.6
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_2+NO_3 (mg/L): RAW	NO_2+NO_3 (mg/L): OUTFALL 30	NO_2+NO_3 (mg/L): OUTFALL 20	NO_2+NO_3 (mg/L): OUTFALL 10: FEC
Sun-01				11.5
Mon-02				12.2
Tue-03				11.8
Wed-04	< 0.01			8.9
Thu-05				11.2
Fri-06				11.1
Sat-07		0.35	0.47	9.67
Sun-08				9.62
Mon-09				11.2
Tue-10				11.4
Wed-11	< 0.01			11.0
Thu-12				11.1
Fri-13				10.5
Sat-14				11.1
Sun-15				13.6
Mon-16				12.4
Tue-17				11.5
Wed-18	< 0.01			13.9
Thu-19				12.0
Fri-20				12.4
Sat-21				12.2
Sun-22				12.6
Mon-23		0.29		8.3
Tue-24		0.35		7.4
Wed-25	< 0.01			10.1
Thu-26				10.8
Fri-27				9.5
Sat-28				10.2
Sun-29				10.9
Mon-30				11.4
Tue 31				11.0
Average	0.01	0.33	0.47	11.0
Minimum	< 0.01	0.29	0.47	7.38
Maximum	0.01	0.35	0.47	13.9
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10: FEC
Sun-01	63			77.7
Mon-02	67			71.3
Tue-03	58			89.5
Wed-04	68			77.2
Thu-05	68			80.5
Fri-06	72			81.1
Sat-07	46	48.5	31.2	73.2
Sun-08	66			64.8
Mon-09	72			81.3
Tue-10	76			90.1
Wed-11	80			83.4
Thu-12	74			84.6
Fri-13	70			80.4
Sat-14	69			80.3
Sun-15	69			74.6
Mon-16	70			74.2
Tue-17	73			78.6
Wed-18	72			85.3
Thu-19	70			90.8
Fri-20	71			88.5
Sat-21	73			85.2
Sun-22	71			84.6
Mon-23	44	51.0		66.2
Tue-24	65	61.2		59.7
Wed-25	73			77.9
Thu-26	74			82.5
Fri-27	72			85.0
Sat-28	71			85.8
Sun-29	70			81.0
Mon-30	75			80.5
Tue 31	74			91.2
Average	69	53.6	31.2	80.2
Minimum	44	48.5	31.2	59.7
Maximum	80	61.2	31.2	91.2
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW	*E. coli*: OUTFALL 30	*E. coli*: OUTFALL 20	*E. coli*: OUTFALL 10: FEC
Sun-01				10
Mon-02				20
Tue-03				30
Wed-04				68
Thu-05				23
Fri-06				15
Sat-07		1.1	1	20
Sun-08				17
Mon-09				16
Tue-10				8
Wed-11				12
Thu-12				15
Fri-13	2			8
Sat-14				10
Sun-15				8
Mon-16				22
Tue-17				34
Wed-18				16
Thu-19				11
Fri-20				11
Sat-21				18
Sun-22				14
Mon-23		0.7		18
Tue-24		0.05		27
Wed-25	2.8			16
Thu-26				10
Fri-27				11
Sat-28				5
Sun-29				8
Mon-30				12
Tue 31				12
Average	---	---	---	---
Minimum	2.0	0.0	1	5
Maximum	2.8	1.1	1	68
GeoMean	2.4	0.3	1	15
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
32	32	100%	213	213	100%

Report Comments

	Variance to 24h raw composite sample noted for August 2 (30h) and August 3 (18h). Sample not lost, monitoring requirements still met

AEP Ref #

RAW Untreated Influent into the plant
INF Untreated wastewater from collection system
INFs Influent, screened at the Headworks Diversion Structure
PE Primary Effluent from conventional primaries
PE 30 Primary Effluent from conventional primaries discharged via Outfall 30
EPT Enhanced Primary Treatment
EPE Enhanced Primary Effluent
EPEEPS Enhanced Primary Effluent Pump Station
FE Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 Combined Bypass (RAW + PE + EPE)
OUTFALL 30 Combined Bypass (INF + INFS + PE30 + EPE)
MPW Membrane Product Water (Effluent re-use water)
ML Megalitre (1,000,000 Litre)
MPN Most Probable Number
NR No Result
NS No Sample
INS Insufficient Sample
AEP Alberta Environment & Parks

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
September 2021

Digested Sludge: Total Monthly Volume (ML)	68.3

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent	Effluent				
			Non UV Disinfected			UV Disinfected	
		INFs	RAW	OUTFALL 30	OUTFALL 20	MPW	EPEEPS	OUTFALL 10
								FEC	FE
Wed-01	630.7	0.0	321.5	26.6	0.0	11.3	0.0	283.6	283.6
Thu-02	569.9	0.0	297.0	11.1	0.0	11.2	0.0	274.7	274.7
Fri-03	302.1	0.0	260.9	0.0	0.0	11.3	0.0	249.6	249.6
Sat-04	299.3	0.0	251.2	0.0	0.0	11.0	0.0	240.2	240.2
Sun-05	303.5	0.0	245.6	0.0	0.0	11.1	0.0	234.5	234.5
Mon-06	345.3	0.0	257.8	0.0	0.0	11.3	0.0	246.5	246.5
Tue-07	328.5	0.0	263.5	0.0	0.0	11.4	0.0	252.1	252.1
Wed-08	299.7	0.0	256.7	0.0	0.0	11.4	0.0	245.3	245.3
Thu-09	459.0	0.0	257.2	0.0	0.0	11.5	0.0	245.7	245.7
Fri-10	579.4	0.0	314.9	35.3	0.0	11.4	0.0	268.2	268.2
Sat-11	458.6	0.0	289.5	6.8	0.0	11.3	0.0	271.4	271.4
Sun-12	1,108.5	0.0	351.9	80.6	0.0	11.2	0.0	260.1	260.1
Mon-13	358.3	0.0	284.6	0.0	0.0	11.4	0.0	273.2	273.2
Tue-14	307.5	0.0	260.2	0.0	0.0	11.9	0.0	248.3	248.3
Wed-15	299.0	0.0	260.1	0.0	0.0	13.0	0.0	247.1	247.1
Thu-16	294.4	0.0	255.6	0.0	0.0	12.2	0.0	243.4	243.4
Fri-17	334.1	0.0	256.3	0.0	0.0	11.2	0.0	245.1	245.1
Sat-18	355.2	0.0	250.0	0.0	0.0	11.3	0.0	238.7	238.7
Sun-19	557.2	0.0	283.2	12.6	0.0	11.6	0.0	259.0	259.0
Mon-20	319.9	0.0	260.0	0.0	0.0	11.3	0.0	248.7	248.7
Tue-21	321.4	0.0	261.2	0.0	0.0	11.0	0.0	250.2	250.2
Wed-22	529.2	0.0	265.8	14.7	0.0	11.4	0.0	239.7	239.7
Thu-23	392.7	0.0	252.7	2.0	0.0	11.2	0.0	239.5	239.5
Fri-24	311.3	0.0	251.6	0.0	0.0	10.8	0.0	240.8	240.8
Sat-25	328.7	0.0	246.7	0.0	0.0	10.8	0.0	235.9	235.9
Sun-26	355.8	0.0	253.7	0.0	0.0	10.8	0.0	242.9	242.9
Mon-27	354.9	0.0	259.3	0.0	0.0	11.1	0.0	248.2	248.2
Tue-28	373.2	0.0	255.9	0.0	0.0	11.2	0.0	244.7	244.7
Wed-29	338.6	0.0	254.9	0.0	0.0	11.3	0.0	243.6	243.6
Thu-30	328.9	0.0	254.6	0.0	0.0	10.8	0.0	243.8	243.8
Average	404.8	0.0	267.8	6.3	0.0	11.3	0.0	250.2	250.2
Minimum	294.4	0.0	245.6	0.0	0.0	10.8	0.0	234.5	234.5
Maximum	1,108.5	0.0	351.9	80.6	0.0	13.0	0.0	283.6	283.6
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,034	190	0	340	0	7,505	7,505

Liquid Stream Quality

DATE	pH@25°C				TSS (mg/L)					BOD$_5$/cBOD$_5$ (mg/L)						TP (mg/L)					NH3-N (mg/L)					TKN (mg/L)				NO$_3$+NO$_2$ (mg/L)				Chloride (mg/L)				*E. coli* (Counts/100 mL)			
	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPEEPS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPEEPS	OUTFALL 10		RAW	OUTFALL 30	OUTFALL 20	EPEEPS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	EPEEPS	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10
				FEC					FEC					FEC	FE					FEC	FE					FEC	FE					FEC					FEC					FEC
										BOD$_5$	BOD$_5$	BOD$_5$	BOD$_5$	cBOD$_5$	cBOD$_5$																														
Wed-01	7.3	7.6		7.5	320	72			5.8	358	144			3	3	6.59	4.56			0.37	0.37	31.0	34.2			0.97	0.97	47.1	48.1		2.80	< 0.01	0.17		10.6	69	83		85		1.7		13
Thu-02	7.5	7.7		7.5	340	51			5.2	277	78			3	3	6.77	2.60			0.32	0.32	33.0	27.8			0.49	0.49	57.2	34.7		2.30		0.21		9.21	74	62		77		0.5		16
Fri-03	7.3			7.4	280				4.4	298				3	3	6.76				0.33	0.33	35.0				0.37	0.37	57.4			2.30				12.6	75			86				20
Sat-04	7.4			7.5	260				4.3	386				3	3	6.67				0.33	0.33	28.8				0.29	0.29	54.9			2.20				13.1	68			89				12
Sun-05	7.5			7.5	224				4.4	219				3	3	6.06				0.31	0.31	35.1				0.30	0.30	51.2			2.10				14.1	69			84				16
Mon-06	7.4			7.5	288				4.3	289				2	2	6.27				0.32	0.32	36.1				0.62	0.62	52.7			2.50				14.8	72			84				15
Tue-07	7.3			7.5	252				6.1	306				4	4	6.22				0.45	0.45	34.8				0.55	0.55	50.8			2.20				13.7	76			81				22
Wed-08	7.4			7.5	296				7.1	304				3	3	7.86				0.52	0.52	36.4				0.13	0.13	58.0			2.50	< 0.01			13.9	78			91				16
Thu-09	7.4			7.6	160				6.8	226				3	3	6.65				0.52	0.52	39.0				0.12	0.12	58.8			2.40				13.9	80			96	2.6			330
Fri-10	7.5	7.5		7.4	384	62			6.5	278	130			3	3	7.62	3.91			0.47	0.47	34.6	33.8			0.21	0.21	61.1	41.1		2.20		0.04		11.8	76	72		91		1.8		20
Sat-11	7.5	7.8		7.4	224	66			7.4	272	173			4	4	6.17	5.45			0.42	0.42	33.1	38.3			0.28	0.28	54.3	49.7		2.50		0.04		11.9	67	74		87		2.2		8
Sun-12	7.4	7.6		7.4	368	57			5.2	249	89			4	4	6.11	3.72			0.43	0.43	27.1	33.4			0.16	0.16	48.7	38.0		1.90		0.09		11.7	55	57		74		1.6		30
Mon-13	7.5			7.5	372				6.2	316				4	4	7.29				0.36	0.36	35.6				0.23	0.23	57.9			1.90				11.2	72			68				45
Tue-14	7.4			7.5	312				5.0	275				3	3	6.89				0.31	0.31	40.5				0.31	0.31	58.7			2.00				13.2	78			85				12
Wed-15	7.6			7.6	288				3.9	274				3	3	6.87				0.26	0.26	36.8				0.28	0.28	56.8			1.60	< 0.01			14.4	74			89				7
Thu-16	7.5			7.6	291				4.6	349				< 2	2	7.28				0.29	0.29	39.7				0.36	0.36	60.3			2.00				14.6	77			87				3
Fri-17	7.5			7.6	320				4.1	334				3	3	6.72				0.28	0.28	39.3				1.10	1.10	52.9			2.60				14.6	76			86				6
Sat-18	7.3			7.5	324				4.1	296				3	3	7.05				0.26	0.26	43.3				0.62	0.62	54.3			2.40				14.4	73			88				5
Sun-19	7.5	7.7		7.5	280	66			4.9	258	151			3	3	6.82	5.22			0.28	0.28	34.8	42.9			0.52	0.52	53.1	55.8		2.50		0.05		13.6	67	73		82		1.1		6
Mon-20	7.4			7.5	480				5.0	339				3	3	8.19				0.28	0.28	40.6				0.52	0.52	64.7			2.20				13.5	76			90				2
Tue-21	7.4			7.5	268				4.6	317				3	3	7.35				0.32	0.32	39.4				0.40	0.40	60.9			2.40				14.2	76			92	4.5			8
Wed-22	7.5	7.7		7.5	332	74			5.3	305	156			4	4	6.73	7.04			0.32	0.32	36.1	43.6			0.47	0.47	54.3	53.0		2.10	< 0.01	0.22		14.7	77	96		89		1.9		6
Thu-23	7.4	7.8		7.5	296	34			4.7	277	99			3	3	6.82	4.40			0.30	0.30	36.2	38.4			0.54	0.54	52.4	43.3		2.20		0.11		14.0	72	82		87		1.6		6
Fri-24	7.5			7.5	308				4.7	292				3	3	7.12				0.31	0.31	32.7				0.61	0.61	53.4			2.20				14.6	67			92				3
Sat-25	7.5			7.6	257				4.6	240				3	3	6.74				0.30	0.30	33.4				0.42	0.42	47.0			2.00				14.6	67			82				1
Sun-26	7.5			7.5	312				4.5	287				3	3	6.69				0.34	0.34	35.5				0.63	0.63	55.8			2.20				15.4	139			84				3
Mon-27	7.6			7.6	264				4.9	281				4	4	6.36				0.32	0.32	37.6				0.64	0.64	53.1			2.40				14.2	72			81				5
Tue-28	7.4			7.4	392				4.8	307				3	3	7.26				0.30	0.30	36.5				0.28	0.28	61.2			1.80				14.2	76			89				7
Wed-29	7.2			7.2	616				4.8	247				3	3	7.25				0.33	0.33	35.8				0.22	0.22	60.6			1.90	0.01			18.4	75			89				4
Thu-30	7.5			7.2	564				6.8	314				3	3	7.90				0.36	0.36	37.5				0.16	0.16	65.0			2.20				18.3	70			90				4
Average	7.4	7.7	---	7.5	322	60	---	---	5.2	292	128	---	---	3	3	6.90	4.61	---	---	0.34	0.34	35.8	36.6	---	---	0.43	0.43	55.8	45.5	---	2.22	0.01	0.12	---	13.8	75	75	---	86	---	---	---	---
Minimum	7.3	7.5	---	7.2	160	34	---	---	3.9	219	78	---	---	< 2	2	6.06	2.60	---	---	0.26	0.26	27.1	27.8	---	---	0.12	0.12	47.0	34.7	---	1.60	< 0.01	0.04	---	9.21	55	57	---	68	2.6	0.5	---	1
Maximum	7.5	7.8	---	7.6	616	74	---	---	7.4	386	173	---	---	4	4	8.19	7.04	---	---	0.52	0.52	43.3	43.6	---	---	1.10	1.10	65.0	55.8	---	2.80	0.01	0.22	---	18.4	139	96	---	96	4.5	2.2	---	330
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	7,505	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
24	24	100%	237	237	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
October 2021

Digested Sludge: Total Monthly Volume (ML)	72.3

Volume of Flow (ML) / Liquid Stream Quality — pH

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Non UV Disinfected OUTFALL 20	Non UV Disinfected MPW	UV Disinfected EPEPS	UV Disinfected OUTFALL 10 FEC	UV Disinfected OUTFALL 10 FE	pH@25°C RAW	pH OUTFALL 30	pH OUTFALL 20	pH OUTFALL 10 FEC
Fri-01	318.8	0.0	256.0	0.0	0.0	10.7	0.0	245.3	245.3	7.5			7.3
Sat-02	352.9	0.0	243.8	0.0	0.0	10.8	0.0	233.0	233.0	7.5			7.2
Sun-03	460.0	0.0	247.1	0.0	0.0	11.6	0.0	235.5	235.5	7.5			7.3
Mon-04	351.2	0.0	263.1	0.0	0.0	11.4	0.0	251.7	251.7	7.4			7.4
Tue-05	349.8	0.0	254.2	0.0	0.0	11.2	0.0	243.0	243.0	7.5			7.4
Wed-06	315.7	0.0	250.1	0.0	0.0	11.6	0.0	238.5	238.5	7.5			7.4
Thu-07	338.8	0.0	249.9	0.0	0.0	11.1	0.0	238.8	238.8	7.4			7.5
Fri-08	331.3	0.0	252.5	0.0	0.0	11.1	0.0	241.4	241.4	7.6			7.4
Sat-09	330.9	0.0	242.5	0.0	0.0	11.1	0.0	231.4	231.4	7.5			7.4
Sun-10	345.8	0.0	243.3	0.0	0.0	11.0	0.0	232.3	232.3	7.5			7.6
Mon-11	410.5	0.0	249.9	0.0	0.0	11.0	0.0	238.9	238.9	7.5			7.5
Tue-12	406.0	0.0	247.8	0.0	0.0	10.7	0.0	237.1	237.1	7.6			7.7
Wed-13	344.3	0.0	246.3	0.0	0.0	10.6	0.0	235.7	235.7	7.5			8.0
Thu-14	337.2	0.0	245.9	0.0	0.0	10.9	0.0	235.0	235.0	7.4			7.5
Fri-15	335.1	0.0	246.6	0.0	0.0	11.9	0.0	234.7	234.7	7.6			7.6
Sat-16	380.1	0.0	241.2	0.0	0.0	12.0	0.0	229.2	229.2	7.4			7.5
Sun-17	353.5	0.0	243.8	0.0	0.0	12.5	0.0	231.3	231.3	7.6			7.5
Mon-18	334.8	0.0	245.5	0.0	0.0	12.9	0.0	232.6	232.6	7.6			7.9
Tue-19	334.7	0.0	243.8	0.0	0.0	6.7	0.0	237.1	237.1	7.6			7.9
Wed-20	330.4	0.0	245.9	0.0	0.0	4.1	0.0	241.8	241.8	7.4			7.6
Thu-21	336.7	0.0	243.6	0.0	0.0	6.6	0.0	237.0	237.0	7.5			7.6
Fri-22	330.9	0.0	245.3	0.0	0.0	6.3	0.0	239.0	239.0	7.5			7.5
Sat-23	825.5	0.0	480.0	185.9	0.0	10.0	0.0	284.1	284.1	7.3	7.2		7.5
Sun-24	436.9	0.0	296.1	3.1	0.0	10.8	0.0	282.2	282.2	7.6	7.7		7.5
Mon-25	360.5	0.0	261.1	0.0	0.0	7.2	0.0	253.9	253.9	7.5			7.6
Tue-26	341.0	0.0	251.6	0.0	0.0	7.4	0.0	244.2	244.2	7.6			7.6
Wed-27	337.5	0.0	246.5	0.0	0.0	6.9	0.0	239.6	239.6	7.4			7.5
Thu-28	335.1	0.0	247.0	0.0	0.0	8.8	0.0	238.2	238.2	7.8			7.6
Fri-29	335.5	0.0	249.2	0.0	0.0	11.4	0.0	237.8	237.8	7.5			7.5
Sat-30	360.6	0.0	246.6	0.0	0.0	11.3	0.0	235.3	235.3	7.6			7.5
Sun 31	360.2	0.0	246.5	0.0	0.0	11.4	0.0	235.1	235.1	7.6			7.5
Average	368.5	0.0	257.2	6.1	0.0	10.1	0.0	241.0	241.0	7.5	7.5	---	7.5
Minimum	315.7	0.0	241.2	0.0	0.0	4.1	0.0	229.2	229.2	7.3	7.2	---	7.2
Maximum	825.5	0.0	480.0	185.9	0.0	12.9	0.0	284.1	284.1	7.8	7.7	---	8.0
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,973	189	0	313	0	7,471	7,471	---	---	---	---

Liquid Stream Quality — TSS, BOD₅/cBOD₅, TP

DATE	TSS (mg/L) RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE	BOD_5/$cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE
Fri-01	500				6.6	6.6	289				3.0	3.0	11.00				0.40	0.40
Sat-02	340				7.5	7.5	229				3.0	3.0	7.60				0.35	0.35
Sun-03	332				4.7	4.7	302				3.0	3.0	7.38				0.30	0.30
Mon-04	524				4.4	4.4	253				3.0	3.0	9.06				0.26	0.26
Tue-05	496				7.7	7.7	312				3.0	3.0	9.75				0.31	0.31
Wed-06	364				7.6	7.6	288				3.0	3.0	8.03				0.29	0.29
Thu-07	256				4.2	4.2	253				3.0	3.0	9.29				0.25	0.25
Fri-08	312				4.1	4.1	304				2.0	2.0	11.40				0.29	0.29
Sat-09	208				2.8	2.8	209				2.0	2.0	7.67				0.25	0.25
Sun-10	308				3.0	3.0	228				< 2.0	2.0	7.31				0.23	0.23
Mon-11	276				2.5	2.5	280				2.0	2.0	7.19				0.24	0.24
Tue-12	364				2.5	2.5	419				3.0	3.0	7.90				0.21	0.21
Wed-13	356				4.4	4.4	305				3.0	3.0	7.61				0.23	0.23
Thu-14	284				3.2	3.2	255				3.0	3.0	7.13				0.24	0.24
Fri-15	148				2.2	2.2	219				2.0	2.0	6.22				0.21	0.21
Sat-16	320				2.4	2.4	310				2.0	2.0	7.54				0.19	0.19
Sun-17	292				2.4	2.4	269				2.0	2.0	6.89				0.18	0.18
Mon-18	348				2.7	2.7	325				2.0	2.0	7.16				0.18	0.18
Tue-19	256				2.3	2.3	306				2.0	2.0	6.98				0.17	0.17
Wed-20	316				2.5	2.5	300				2.0	2.0	7.52				0.17	0.17
Thu-21	280				1.7	1.7	388				< 2.0	2.0	7.90				0.20	0.20
Fri-22	308				1.7	1.7	357				< 2.0	2.0	7.52				0.19	0.19
Sat-23	332	80			2.6	2.6	264	106			2.0	2.0	4.76	3.11			0.17	0.17
Sun-24	234	54			2.9	2.9	242	114			2.0	2.0	5.69	2.96			0.18	0.18
Mon-25	352				3.0	3.0	292				< 2.0	2.0	6.58				0.14	0.14
Tue-26	280				2.9	2.9	321				< 2.0	2.0	8.06				0.15	0.15
Wed-27	311				2.7	2.7	320				2.0	2.0	7.70				0.17	0.17
Thu-28	274				2.2	2.2	305				2.0	2.0	9.07				0.19	0.19
Fri-29	268				2.7	2.7	289				2.0	2.0	10.40				0.22	0.22
Sat-30	376				2.9	2.9	395				2.0	2.0	11.50				0.23	0.23
Sun 31	291				4.6	4.6	300				3.0	3.0	9.38				0.25	0.25
Average	320	67	---	---	3.5	3.5	294	110	---	---	2.4	2.4	8.04	3.04	---	---	0.23	0.23
Minimum	148	54	---	---	1.7	1.7	209	106	---	---	< 2.0	2.0	4.76	2.96	---	---	0.14	0.14
Maximum	524	80	---	---	7.7	7.7	419	114	---	---	3.0	3.0	11.5	3.11	---	---	0.40	0.40
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Liquid Stream Quality — NH3-N, TKN, NO₂+NO₃, Chloride, E. coli

DATE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Fri-01	46.1				0.43	0.43	69.9			2.10				15.7	76.2			85.8				5
Sat-02	39.0				0.26	0.26	59.3			2.00				12.4	65.2			78.8				4
Sun-03	31.6				0.14	0.14	56.8			1.60				8.21	73.4			76.9				1
Mon-04	42.0				0.40	0.40	65.0			2.10				8.93	71.8			73.7				3
Tue-05	44.9				0.68	0.68	70.9			2.70				11.2	78.5			80.1				13
Wed-06	41.1				0.50	0.50	63.0			2.40	< 0.01			8.81	75.3			81.1				6
Thu-07	29.1				0.44	0.44	59.2			2.20				7.91	77.7			78.9				9
Fri-08	47.1				0.78	0.78	76.9			2.30				9.82	77.0			81.2				1
Sat-09	27.5				0.39	0.39	54.6			1.90				8.31	71.3			77.7				2
Sun-10	38.9				0.24	0.24	55.5			1.60				7.20	74.1			77.2				1
Mon-11	38.9				0.45	0.45	58.0			1.70				7.35	64.7			75.0				2
Tue-12	37.9				0.27	0.27	61.3			1.50				7.70	78.6			73.8				2
Wed-13	37.0				0.14	0.14	56.4			1.80	< 0.01			8.74	73.7			80.9				4
Thu-14	32.1				0.16	0.16	54.8			1.30				7.37	75.0			79.8				1
Fri-15	31.8				0.21	0.21	52.6			1.50				7.56	78.8			81.6				< 1
Sat-16	31.4				0.28	0.28	55.8			1.80				7.85	74.1			81.9				2
Sun-17	36.6				0.37	0.37	59.0			1.70				7.94	66.5			73.5				1
Mon-18	34.4				0.31	0.31	53.8			1.70				7.50	52.3			68.0				2
Tue-19	38.4				0.26	0.26	54.8			1.60				6.42	76.7			77.7	2.7			1
Wed-20	38.3				0.18	0.18	60.0			1.60	0.03			7.06	76.2			77.3				1
Thu-21	35.7				0.13	0.13	57.7			1.40				6.91	82.4			80.9				2
Fri-22	32.2				0.16	0.16	58.1			1.50				7.04	80.0			83.1	2.2			2
Sat-23	15.7	17.3			0.08	0.08	36.2	23.6		1.50		0.30		4.69	42.4	41.2		73.9		0.1		2
Sun-24	24.9	22.4			0.58	0.58	53.4	28.8		1.80		0.08		4.14	57.1	51.9		51.7		1.0		6
Mon-25	32.9				0.79	0.79	50.2			2.30				5.50	70.4			67.5				9
Tue-26	35.8				0.55	0.55	50.3			1.90				5.94	77.0			80.3				4
Wed-27	45.2				1.28	1.28	56.5			2.60	0.02			8.10	78.3			87.1				2
Thu-28	44.2				1.00	1.00	65.9			2.50				9.90	80.7			86.5				3
Fri-29	45.2				1.25	1.25	62.5			2.70				12.7	91.2			88.4				5
Sat-30	50.3				1.90	1.90	74.1			3.20				12.0	82.0			93.5				5
Sun 31	49.2				2.84	2.84	68.6			4.60				12.2	71.2			78.3				2
Average	37.3	19.9	---	---	0.56	0.56	59.1	26.2	---	2.04	0.02	0.19	---	8.49	73.2	46.6	---	78.5	---	---	---	---
Minimum	15.7	17.3	---	---	0.08	0.08	36.2	23.6	---	1.30	< 0.01	0.08	---	4.14	42.4	41.2	---	51.7	2.2	0.1	---	< 1
Maximum	50.3	22.4	---	---	2.84	2.84	76.9	28.8	---	4.60	0.03	0.30	---	15.7	91.2	51.9	---	93.5	2.7	1.0	---	13
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.4	0.3	---	3
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
17	17	100%	254	254	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
November 2021

Digested Sludge: Total Monthly Volume (ML)	70.8

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEPS	Effluent: UV Disinfected: OUTFALL 10 FEC	Effluent: UV Disinfected: OUTFALL 10 FE
Mon-01	350.5	0.0	251.2	0.0	0.0	11.7	0.0	239.5	239.5
Tue-02	353.8	0.0	250.5	0.0	0.0	11.6	0.0	238.9	238.9
Wed-03	352.0	0.0	252.0	0.0	0.0	12.8	0.0	239.2	239.2
Thu-04	348.9	0.0	249.1	0.0	0.0	12.8	0.0	236.3	236.3
Fri-05	342.2	0.0	247.6	0.0	0.0	12.9	0.0	234.7	234.7
Sat-06	380.5	0.0	245.1	0.0	0.0	12.1	0.0	233.0	233.0
Sun-07	407.9	0.0	256.1	0.0	0.0	12.2	0.0	243.9	243.9
Mon-08	368.9	0.0	246.7	0.0	0.0	11.7	0.0	235.0	235.0
Tue-09	362.0	0.0	243.1	0.0	0.0	12.0	0.0	231.1	231.1
Wed-10	402.9	0.0	245.1	0.0	0.0	11.9	0.0	233.2	233.2
Thu-11	406.3	0.0	240.3	0.0	0.0	12.3	0.0	228.0	228.0
Fri-12	341.8	0.0	246.7	0.0	0.0	12.2	0.0	234.5	234.5
Sat-13	385.2	0.0	239.5	0.0	0.0	12.0	0.0	227.5	227.5
Sun-14	358.9	0.0	246.0	0.0	0.0	12.0	0.0	234.0	234.0
Mon-15	358.8	0.0	254.0	0.0	0.0	10.7	0.0	243.3	243.3
Tue-16	350.6	0.0	247.3	0.0	0.0	11.0	0.0	236.3	236.3
Wed-17	370.9	0.0	244.9	0.0	0.0	11.1	0.0	233.8	233.8
Thu-18	355.4	0.0	245.9	0.0	0.0	11.0	0.0	234.9	234.9
Fri-19	337.2	0.0	246.1	0.0	0.0	11.0	0.0	235.1	235.1
Sat-20	346.6	0.0	241.1	0.0	0.0	11.1	0.0	230.0	230.0
Sun-21	356.1	0.0	245.0	0.0	0.0	11.0	0.0	234.0	234.0
Mon-22	337.4	0.0	249.0	0.0	0.0	10.8	0.0	238.2	238.2
Tue-23	340.9	0.0	237.2	0.0	0.0	11.2	0.0	226.0	226.0
Wed-24	340.5	0.0	245.5	0.0	0.0	11.3	0.0	234.2	234.2
Thu-25	353.3	0.0	250.5	0.0	0.0	11.2	0.0	239.3	239.3
Fri-26	364.5	0.0	259.6	0.0	0.0	11.3	0.0	248.3	248.3
Sat-27	349.3	0.0	245.0	0.0	0.0	11.4	0.0	233.6	233.6
Sun-28	374.4	0.0	250.5	0.0	0.0	11.3	0.0	239.2	239.2
Mon-29	360.1	0.0	253.4	0.0	0.0	11.7	0.0	241.7	241.7
Tue-30	341.7	0.0	247.4	0.0	0.0	12.0	0.0	235.4	235.4
Average	360.0	0.0	247.4	0.0	0.0	11.6	0.0	235.7	235.7
Minimum	337.2	0.0	237.2	0.0	0.0	10.7	0.0	226.0	226.0
Maximum	407.9	0.0	259.6	0.0	0.0	12.9	0.0	248.3	248.3
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,421	0	0	349	0	7,072	7,072

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10 FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEPS	TSS (mg/L): OUTFALL 10 FEC	TSS (mg/L): OUTFALL 10 FE
Mon-01	7.6			7.5	336				3.6	3.6
Tue-02	7.5			7.5	332				3.2	3.2
Wed-03	7.5			7.5	252				3.7	3.7
Thu-04	7.5			7.5	288				3.7	3.7
Fri-05	7.5			7.5	312				3.0	3.0
Sat-06	7.5			7.5	308				4.1	4.1
Sun-07	7.5			7.6	260				3.2	3.2
Mon-08	7.6			7.6	288				4.1	4.1
Tue-09	7.4			7.5	368				3.0	3.0
Wed-10	7.5			7.6	256				4.0	4.0
Thu-11	7.5			7.5	260				5.1	5.1
Fri-12	7.5			7.5	404				4.5	4.5
Sat-13	7.6			7.5	275				4.4	4.4
Sun-14	7.5			7.5	340				4.2	4.2
Mon-15	7.5			7.6	306				3.7	3.7
Tue-16	7.5			7.6	274				4.1	4.1
Wed-17	7.6			7.6	280				4.3	4.3
Thu-18	7.6			7.5	292				3.6	3.6
Fri-19	7.5			7.7	276				3.8	3.8
Sat-20	7.5			7.6	284				4.0	4.0
Sun-21	7.5			7.7	308				4.4	4.4
Mon-22	7.6			7.5	268				4.0	4.0
Tue-23	7.5			7.6	280				4.0	4.0
Wed-24	7.4			7.5	264				3.8	3.8
Thu-25	7.5			7.5	375				4.9	4.9
Fri-26	7.6			7.6	340				5.4	5.4
Sat-27	7.5			7.5	276				5.3	5.3
Sun-28	7.4			7.5	283				4.6	4.6
Mon-29	7.5			7.5	277				3.8	3.8
Tue-30	7.5			7.6	283				4.1	4.1
Average	7.5	---	---	7.6	298	---	---	---	4.1	4.1
Minimum	7.4	---	---	7.5	252	---	---	---	3.0	3.0
Maximum	7.6	---	---	7.7	404	---	---	---	5.4	5.4
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/cBOD_5 (mg/L): RAW	BOD_5/cBOD_5 (mg/L): OUTFALL 30	BOD_5/cBOD_5 (mg/L): OUTFALL 20	BOD_5/cBOD_5 (mg/L): EPEPS	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FEC	BOD_5/cBOD_5 (mg/L): OUTFALL 10 FE
Mon-01	332				3	3
Tue-02	337				2	2
Wed-03	250				2	2
Thu-04	264				2	2
Fri-05	334				2	2
Sat-06	333				3	3
Sun-07	335				3	3
Mon-08	334				3	3
Tue-09	363				3	3
Wed-10	328				3	3
Thu-11	296				3	3
Fri-12	326				4	4
Sat-13	301				3	3
Sun-14	285				3	3
Mon-15	310				3	3
Tue-16	309				3	3
Wed-17	360				3	3
Thu-18	347				4	4
Fri-19	308				2	2
Sat-20	320				3	3
Sun-21	330				2	2
Mon-22	334				3	3
Tue-23	317				3	3
Wed-24	294				2	2
Thu-25	383				3	3
Fri-26	333				3	3
Sat-27	319				3	3
Sun-28	326				3	3
Mon-29	280				3	3
Tue-30	291				3	3
Average	319	---	---	---	3	3
Minimum	250	---	---	---	2	2
Maximum	383	---	---	---	4	4
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEPS	TP (mg/L): OUTFALL 10 FEC	TP (mg/L): OUTFALL 10 FE
Mon-01	10.4				0.24	0.24
Tue-02	9.87				0.24	0.24
Wed-03	8.78				0.24	0.24
Thu-04	9.26				0.24	0.24
Fri-05	8.14				0.27	0.27
Sat-06	8.46				0.30	0.30
Sun-07	8.35				0.30	0.30
Mon-08	7.42				0.31	0.31
Tue-09	8.94				0.30	0.30
Wed-10	8.97				0.33	0.33
Thu-11	8.36				0.34	0.34
Fri-12	9.27				0.33	0.33
Sat-13	7.78				0.30	0.30
Sun-14	7.64				0.28	0.28
Mon-15	7.65				0.14	0.14
Tue-16	7.92				0.25	0.25
Wed-17	7.54				0.26	0.26
Thu-18	7.57				0.25	0.25
Fri-19	7.45				0.28	0.28
Sat-20	7.47				0.28	0.28
Sun-21	6.59				0.26	0.26
Mon-22	7.06				0.16	0.16
Tue-23	7.14				0.26	0.26
Wed-24	7.11				0.29	0.29
Thu-25	7.96				0.30	0.30
Fri-26	8.25				0.32	0.32
Sat-27	9.71				0.35	0.35
Sun-28	8.38				0.33	0.33
Mon-29	8.85				0.24	0.24
Tue-30	9.20				0.29	0.29
Average	8.25	---	---	---	0.28	0.28
Minimum	6.59	---	---	---	0.14	0.14
Maximum	10.4	---	---	---	0.35	0.35
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 30	NH3-N (mg/L): OUTFALL 20	NH3-N (mg/L): EPEPS	NH3-N (mg/L): OUTFALL 10 FEC	NH3-N (mg/L): OUTFALL 10 FE
Mon-01	50.4				1.90	1.90
Tue-02	46.2				1.49	1.49
Wed-03	42.6				0.82	0.82
Thu-04	43.0				0.65	0.65
Fri-05	40.4				0.35	0.35
Sat-06	42.0				0.51	0.51
Sun-07	36.1				0.90	0.90
Mon-08	37.1				0.62	0.62
Tue-09	33.2				0.30	0.30
Wed-10	44.5				1.03	1.03
Thu-11	42.6				1.97	1.97
Fri-12	41.4				1.87	1.87
Sat-13	32.8				1.35	1.35
Sun-14	33.1				1.00	1.00
Mon-15	38.4				1.04	1.04
Tue-16	40.4				1.11	1.11
Wed-17	39.0				1.03	1.03
Thu-18	37.0				0.94	0.94
Fri-19	36.6				0.81	0.81
Sat-20	48.2				0.84	0.84
Sun-21	31.7				0.94	0.94
Mon-22	36.5				0.98	0.98
Tue-23	37.9				0.52	0.52
Wed-24	38.7				0.75	0.75
Thu-25	37.6				1.84	1.84
Fri-26	39.3				1.91	1.91
Sat-27	40.8				2.35	2.35
Sun-28	41.8				2.49	2.49
Mon-29	40.5				2.68	2.68
Tue-30	43.6				2.27	2.27
Average	39.8	---	---	---	1.24	1.24
Minimum	31.7	---	---	---	0.30	0.30
Maximum	50.4	---	---	---	2.68	2.68
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10 FEC
Mon-01	73.8			4.10
Tue-02	74.6			2.80
Wed-03	67.2			2.50
Thu-04	61.8			2.70
Fri-05	63.4			1.80
Sat-06	65.7			2.30
Sun-07	63.4			2.70
Mon-08	63.3			2.40
Tue-09	70.2			2.00
Wed-10	68.2			3.00
Thu-11	68.1			4.10
Fri-12	66.9			4.00
Sat-13	63.0			3.10
Sun-14	60.2			2.70
Mon-15	58.9			0.80
Tue-16	59.5			2.80
Wed-17	58.3			2.80
Thu-18	54.5			2.50
Fri-19	50.7			2.30
Sat-20	52.1			2.50
Sun-21	55.1			2.30
Mon-22	57.9			1.20
Tue-23	56.8			1.80
Wed-24	54.8			1.90
Thu-25	50.7			3.60
Fri-26	56.8			3.40
Sat-27	75.2			3.90
Sun-28	63.9			4.20
Mon-29	63.7			3.30
Tue-30	65.8			4.00
Average	62.2	---	---	2.78
Minimum	50.7	---	---	0.80
Maximum	75.2	---	---	4.20
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10 FEC
Mon-01				12.5
Tue-02				11.0
Wed-03	< 0.01			10.9
Thu-04				11.8
Fri-05				11.5
Sat-06				9.89
Sun-07				9.16
Mon-08				7.98
Tue-09				8.42
Wed-10	< 0.01			9.34
Thu-11				8.33
Fri-12				8.34
Sat-13				8.02
Sun-14				7.36
Mon-15				7.00
Tue-16				8.49
Wed-17	< 0.01			9.70
Thu-18				9.14
Fri-19				9.44
Sat-20				9.36
Sun-21				9.07
Mon-22				8.42
Tue-23				8.26
Wed-24	0.04			7.97
Thu-25				6.54
Fri-26				8.12
Sat-27				9.10
Sun-28				9.29
Mon-29				9.68
Tue-30				9.86
Average	0.02	---	---	9.1
Minimum	< 0.01	---	---	6.54
Maximum	0.04	---	---	12.5
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10 FEC
Mon-01	74.3			72.0
Tue-02	75.8			77.0
Wed-03	74.6			76.7
Thu-04	72.6			77.3
Fri-05	80.8			78.7
Sat-06	65.1			78.7
Sun-07	74.4			71.5
Mon-08	68.6			69.7
Tue-09	77.8			75.5
Wed-10	82.0			83.2
Thu-11	72.2			85.4
Fri-12	80.1			79.1
Sat-13	71.5			83.6
Sun-14	69.7			75.3
Mon-15	122			74.8
Tue-16	156			151
Wed-17	113			143
Thu-18	121			135
Fri-19	132			130
Sat-20	98.0			142
Sun-21	93.6			104
Mon-22	122			104
Tue-23	106			128
Wed-24	191			136
Thu-25	141			101
Fri-26	159			147
Sat-27	102			160
Sun-28	111			109
Mon-29	98.9			108
Tue-30	101			106
Average	100	---	---	102
Minimum	65.1	---	---	69.7
Maximum	191	---	---	160
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW X10^6	*E. coli* (Counts/100 mL): OUTFALL 30 X10^6	*E. coli* (Counts/100 mL): OUTFALL 20 X10^6	*E. coli* (Counts/100 mL): OUTFALL 10 FEC
Mon-01				7
Tue-02				2
Wed-03	6.3			7
Thu-04				2
Fri-05				1
Sat-06				4
Sun-07				7
Mon-08				12
Tue-09				6
Wed-10				4
Thu-11				12
Fri-12				6
Sat-13				35
Sun-14				4
Mon-15				2
Tue-16				8
Wed-17				4
Thu-18				12
Fri-19	1.7			1
Sat-20				3
Sun-21				4
Mon-22				3
Tue-23				5
Wed-24				2
Thu-25				10
Fri-26				2
Sat-27				4
Sun-28				6
Mon-29				2
Tue-30				7
Average	---	---	---	---
Minimum	1.7	---	---	1
Maximum	6.3	---	---	35
GeoMean	3.3	---	---	4
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	254	254	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
	Alberta Environment & Parks

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Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Gold Bar Wastewater Treatment Plant
Plant Performance Report
December 2021

Digested Sludge: Total Monthly Volume (ML)	65.6

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Wed-01	343.7	0.0	257.8	0.0	0.0	12.4	0.0	245.4	245.4
Thu-02	342.4	0.0	252.1	0.0	0.0	11.7	0.0	240.4	240.4
Fri-03	334.9	0.0	250.1	0.0	0.0	11.1	0.0	239.0	239.0
Sat-04	360.0	0.0	249.0	0.0	0.0	11.2	0.0	237.8	237.8
Sun-05	367.4	0.0	250.3	0.0	0.0	11.3	0.0	239.0	239.0
Mon-06	350.6	0.0	255.0	0.0	0.0	11.7	0.0	243.3	243.3
Tue-07	344.7	0.0	248.8	0.0	0.0	11.9	0.0	236.9	236.9
Wed-08	484.0	0.0	287.0	17.2	0.0	12.1	0.0	257.7	257.7
Thu-09	349.4	0.0	251.0	0.0	0.0	10.2	0.0	240.8	240.8
Fri-10	337.5	0.0	251.8	0.0	0.0	10.9	0.0	240.9	240.9
Sat-11	360.8	0.0	248.7	0.0	0.0	11.1	0.0	237.6	237.6
Sun-12	362.2	0.0	247.7	0.0	0.0	11.2	0.0	236.5	236.5
Mon-13	346.2	0.0	254.3	0.0	0.0	11.9	0.0	242.4	242.4
Tue-14	344.8	0.0	250.2	0.0	0.0	12.0	0.0	238.2	238.2
Wed-15	345.4	0.0	253.1	0.0	0.0	11.0	0.0	242.1	242.1
Thu-16	337.3	0.0	251.3	0.0	0.0	11.8	0.0	239.5	239.5
Fri-17	348.8	0.0	253.3	0.0	0.0	11.1	0.0	242.2	242.2
Sat-18	359.1	0.0	251.4	0.0	0.0	11.4	0.0	240.0	240.0
Sun-19	356.1	0.0	248.1	0.0	0.0	12.2	0.0	235.9	235.9
Mon-20	367.1	0.0	245.8	0.0	0.0	12.0	0.0	233.8	233.8
Tue-21	338.6	0.0	243.7	0.0	0.0	12.2	0.0	231.5	231.5
Wed-22	336.3	0.0	249.6	0.0	0.0	12.5	0.0	237.1	237.1
Thu-23	352.7	0.0	254.3	0.0	0.0	12.2	0.0	242.1	242.1
Fri-24	369.9	0.0	256.1	0.0	0.0	12.4	0.0	243.7	243.7
Sat-25	339.7	0.0	232.7	0.0	0.0	11.8	0.0	220.9	220.9
Sun-26	341.3	0.0	231.9	0.0	0.0	12.1	0.0	219.8	219.8
Mon-27	357.8	0.0	243.5	0.0	0.0	11.9	0.0	231.6	231.6
Tue-28	347.7	0.0	248.0	0.0	0.0	11.8	0.0	236.2	236.2
Wed-29	352.3	0.0	251.0	0.0	0.0	11.6	0.0	239.4	239.4
Thu-30	352.4	0.0	252.5	0.0	0.0	11.6	0.0	240.9	240.9
Fri 31	368.6	0.0	256.2	0.0	0.0	11.1	0.0	245.1	245.1
Average	354.8	0.0	250.8	0.6	0.0	11.7	0.0	238.6	238.6
Minimum	334.9	0.0	231.9	0.0	0.0	10.2	0.0	219.8	219.8
Maximum	484.0	0.0	287.0	17.2	0.0	12.5	0.0	257.7	257.7
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,776	17	0	361	0	7,398	7,398

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10: FEC
Wed-01	7.5			7.5
Thu-02	7.5			7.4
Fri-03	7.5			7.5
Sat-04	7.4			7.5
Sun-05	7.5			7.6
Mon-06	7.4			7.5
Tue-07	7.5			7.5
Wed-08	7.4	7.5		7.2
Thu-09	7.6			7.4
Fri-10	7.6			7.4
Sat-11	7.5			7.5
Sun-12	7.6			7.5
Mon-13	7.4			7.5
Tue-14	7.4			7.5
Wed-15	7.6			7.5
Thu-16	7.4			7.5
Fri-17	7.4			7.5
Sat-18	7.5			7.6
Sun-19	7.5			7.5
Mon-20	7.5			7.5
Tue-21	7.5			7.6
Wed-22	7.6			7.6
Thu-23	7.4			7.6
Fri-24	7.4			7.5
Sat-25	7.6			7.7
Sun-26	7.6			7.5
Mon-27	7.6			7.5
Tue-28	7.6			7.5
Wed-29	7.5			7.6
Thu-30	7.5			7.5
Fri 31	7.5			7.5
Average	7.5	7.5	---	7.5
Minimum	7.4	7.5	---	7.2
Maximum	7.6	7.5	---	7.7
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEPS	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE
Wed-01	257				3.7	3.7
Thu-02	432				3.3	3.3
Fri-03	312				4.5	4.5
Sat-04	337				5.6	5.6
Sun-05	260				4.0	4.0
Mon-06	297				5.4	5.4
Tue-07	311				5.2	5.2
Wed-08	288	50			6.6	6.6
Thu-09	296				5.4	5.4
Fri-10	296				5.6	5.6
Sat-11	284				4.2	4.2
Sun-12	304				4.8	4.8
Mon-13	296				5.5	5.5
Tue-14	276				5.5	5.5
Wed-15	364				5.4	5.4
Thu-16	304				4.5	4.5
Fri-17	308				4.7	4.7
Sat-18	312				5.6	5.6
Sun-19	300				4.9	4.9
Mon-20	317				5.2	5.2
Tue-21	308				5.2	5.2
Wed-22	295				5.0	5.0
Thu-23	264				4.3	4.3
Fri-24	272				4.9	4.9
Sat-25	184				4.5	4.5
Sun-26	416				4.5	4.5
Mon-27	284				5.3	5.3
Tue-28	320				14.0	14.0
Wed-29	348				12.3	12.3
Thu-30	343				4.8	4.8
Fri 31	308				6.1	6.1
Average	306	50	---	---	5.5	5.5
Minimum	184	50	---	---	3.3	3.3
Maximum	432	50	---	---	14.0	14.0
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L): RAW	BOD_5/$cBOD_5$ (mg/L): OUTFALL 30	BOD_5/$cBOD_5$ (mg/L): OUTFALL 20	BOD_5/$cBOD_5$ (mg/L): EPEPS	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FEC	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FE
Wed-01	262				3.0	3.0
Thu-02	341				3.0	3.0
Fri-03	299				3.0	3.0
Sat-04	331				3.0	3.0
Sun-05	342				3.0	3.0
Mon-06	331				3.0	3.0
Tue-07	310				3.0	3.0
Wed-08	268	114			3.0	3.0
Thu-09	377				3.0	3.0
Fri-10	289				3.0	3.0
Sat-11	271				3.0	3.0
Sun-12	336				3.0	3.0
Mon-13	363				3.0	3.0
Tue-14	303				3.0	3.0
Wed-15	309				3.0	3.0
Thu-16	321				3.0	3.0
Fri-17	344				3.0	3.0
Sat-18	326				3.0	3.0
Sun-19	317				3.0	3.0
Mon-20	389				3.0	3.0
Tue-21	300				3.0	3.0
Wed-22	304				4.0	4.0
Thu-23	320				3.0	3.0
Fri-24	368				3.0	3.0
Sat-25	305				3.0	3.0
Sun-26	340				3.0	3.0
Mon-27	368				3.0	3.0
Tue-28	339				5.0	5.0
Wed-29	314				5.0	5.0
Thu-30	354				3.0	3.0
Fri 31	321				3.0	3.0
Average	325	114	---	---	3.2	3.2
Minimum	262	114	---	---	3.0	3.0
Maximum	389	114	---	---	5.0	5.0
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPEPS	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE
Wed-01	8.78				0.29	0.29
Thu-02	9.46				0.27	0.27
Fri-03	9.13				0.29	0.29
Sat-04	9.05				0.32	0.32
Sun-05	8.50				0.32	0.32
Mon-06	8.56				0.31	0.31
Tue-07	8.86				0.33	0.33
Wed-08	8.61	4.97			0.35	0.35
Thu-09	9.78				0.36	0.36
Fri-10	9.62				0.34	0.34
Sat-11	9.16				0.34	0.34
Sun-12	9.63				0.32	0.32
Mon-13	10.30				0.33	0.33
Tue-14	9.91				0.33	0.33
Wed-15	9.94				0.37	0.37
Thu-16	9.68				0.35	0.35
Fri-17	9.15				0.37	0.37
Sat-18	9.03				0.56	0.56
Sun-19	8.82				0.33	0.33
Mon-20	9.82				0.32	0.32
Tue-21	10.20				0.40	0.40
Wed-22	9.78				0.35	0.35
Thu-23	10.0				0.37	0.37
Fri-24	9.46				0.35	0.35
Sat-25	9.64				0.33	0.33
Sun-26	11.60				0.31	0.31
Mon-27	9.33				0.37	0.37
Tue-28	8.65				0.78	0.78
Wed-29	9.44				0.64	0.64
Thu-30	9.19				0.35	0.35
Fri 31	8.80				0.41	0.41
Average	9.42	4.97	---	---	0.37	0.37
Minimum	8.50	4.97	---	---	0.27	0.27
Maximum	11.6	4.97	---	---	0.78	0.78
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NHS-N (mg/L): RAW	NHS-N (mg/L): OUTFALL 30	NHS-N (mg/L): OUTFALL 20	NHS-N (mg/L): EPEPS	NHS-N (mg/L): OUTFALL 10: FEC	NHS-N (mg/L): OUTFALL 10: FE
Wed-01	41.2				3.93	3.93
Thu-02	44.1				2.52	2.52
Fri-03	45.5				3.28	3.28
Sat-04	46.3				3.54	3.54
Sun-05	44.9				3.72	3.72
Mon-06	44.7				3.31	3.31
Tue-07	44.3				3.41	3.41
Wed-08	33.5	2.1			1.30	1.30
Thu-09	47.5				1.64	1.64
Fri-10	47.1				2.54	2.54
Sat-11	45.3				2.61	2.61
Sun-12	48.8				3.05	3.05
Mon-13	46.6				3.99	3.99
Tue-14	31.4				3.13	3.13
Wed-15	47.0				3.92	3.92
Thu-16	42.6				2.28	2.28
Fri-17	39.3				2.54	2.54
Sat-18	44.7				1.72	1.72
Sun-19	43.0				2.47	2.47
Mon-20	42.5				1.68	1.68
Tue-21	46.0				2.47	2.47
Wed-22	46.4				1.55	1.55
Thu-23	44.3				1.83	1.83
Fri-24	45.2				2.68	2.68
Sat-25	45.8				2.99	2.99
Sun-26	52.1				4.75	4.75
Mon-27	46.7				4.75	4.75
Tue-28	46.5				3.87	3.87
Wed-29	45.8				2.61	2.61
Thu-30	42.1				2.56	2.56
Fri 31	43.1				2.81	2.81
Average	44.3	2.1	---	---	2.76	2.76
Minimum	31.4	2.1	---	---	0.72	0.72
Maximum	52.1	2.1	---	---	4.75	4.75
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10: FEC
Wed-01	65.7			6.10
Thu-02	68.0			4.40
Fri-03	62.7			5.20
Sat-04	62.9			5.70
Sun-05	63.3			5.40
Mon-06	60.7			5.90
Tue-07	67.1			5.40
Wed-08	59.0	52.3		2.90
Thu-09	72.8			3.80
Fri-10	66.9			4.50
Sat-11	68.9			4.70
Sun-12	65.3			5.70
Mon-13	75.5			6.00
Tue-14	74.3			6.30
Wed-15	69.1			5.70
Thu-16	66.0			4.20
Fri-17	62.4			4.10
Sat-18	64.6			4.20
Sun-19	61.5			4.30
Mon-20	65.0			4.60
Tue-21	67.0			4.20
Wed-22	72.6			4.00
Thu-23	67.6			4.00
Fri-24	69.2			4.80
Sat-25	64.0			4.90
Sun-26	77.7			5.00
Mon-27	68.3			6.10
Tue-28	64.9			7.50
Wed-29	71.6			5.90
Thu-30	61.1			5.10
Fri 31	67.4			4.70
Average	66.9	52.3	---	5.01
Minimum	59.0	52.3	---	2.90
Maximum	77.7	52.3	---	7.50
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 30	NO_3+NO_2 (mg/L): OUTFALL 20	NO_3+NO_2 (mg/L): OUTFALL 10: FEC
Wed-01	0.01			9.62
Thu-02				9.71
Fri-03				11.7
Sat-04				11.4
Sun-05				10.4
Mon-06				10.6
Tue-07				11.00
Wed-08	< 0.07	0.04		10.90
Thu-09				10.6
Fri-10				12.40
Sat-11				13.0
Sun-12				12.3
Mon-13				12.1
Tue-14				11.90
Wed-15	0.02			10.30
Thu-16				8.1
Fri-17				9.9
Sat-18				8.1
Sun-19				9.1
Mon-20				9.0
Tue-21				8.4
Wed-22	< 0.01			8.7
Thu-23				9.0
Fri-24				8.8
Sat-25				9.5
Sun-26				11.3
Mon-27				11.0
Tue-28				9.0
Wed-29	0.07			9.20
Thu-30				8.37
Fri 31				8.52
Average	0.04	0.04	---	10.2
Minimum	< 0.01	0.04	---	8.09
Maximum	0.07	0.04	---	13.0
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10: FEC
Wed-01	123			104
Thu-02	134			171
Fri-03	105			131
Sat-04	95			114
Sun-05	87			97
Mon-06	97			91
Tue-07	103			100
Wed-08	534	980		258
Thu-09	130			360
Fri-10	118			169
Sat-11	112			132
Sun-12	128			130
Mon-13	116			130
Tue-14	114			121
Wed-15	111			120
Thu-16	112			112
Fri-17	106			117
Sat-18	88			103
Sun-19	86			96
Mon-20	105			100
Tue-21	120			116
Wed-22	158			138
Thu-23	142			157
Fri-24	110			141
Sat-25	84			110
Sun-26	78			92
Mon-27	83			83
Tue-28	83			85
Wed-29	97			89
Thu-30	85			93
Fri 31	82			92
Average	120	980	---	127
Minimum	78	980	---	83
Maximum	534	980	---	360
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RAW	*E. coli*: OUTFALL 30	*E. coli*: OUTFALL 20	*E. coli*: OUTFALL 10: FEC
	X10^5	X10^6	X10^6	FEC
Wed-01				2
Thu-02				2
Fri-03				2
Sat-04				2
Sun-05				2
Mon-06				6
Tue-07				4
Wed-08		0.2		3
Thu-09				5
Fri-10				2
Sat-11				1
Sun-12				3
Mon-13				4
Tue-14				3
Wed-15	2.0			2
Thu-16				3
Fri-17				2
Sat-18				3
Sun-19				3
Mon-20				2
Tue-21	0.7			4
Wed-22				7
Thu-23				5
Fri-24				1
Sat-25				< 1
Sun-26				2
Mon-27				6
Tue-28				2
Wed-29				3
Thu-30				4
Fri 31				2
Average	---	---	---	---
Minimum	0.7	0.2	---	< 1
Maximum	2.0	0.2	---	7
GeoMean	1.2	0.2	---	3
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
5	5	100%	259	259	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Appendix B – WWTP Chemicals

2021 Secondary Alum Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	37	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	125	0	0	0
4	0	0	0	0	0	0	0	445	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	3513	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	513	0	0	0	0	0	0	0
9	0	0	3104	0	1205	0	0	0	461	0	0	0
10	0	0	7002	0	0	0	0	0	0	0	0	0
11	0	0	12595	545	0	0	0	0	0	0	0	0
12	0	0	16851	0	0	0	0	0	0	0	0	0
13	0	0	18434	0	0	0	0	0	0	0	0	0
14	0	0	15820	0	0	0	0	0	0	0	0	0
15	0	0	2072	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	361	0	0	0	1	0	0	0	0	0	0
22	0	3774	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	197	0	0	0	0	0	0	0	0
25	0	8779	453	1055	0	0	0	0	0	0	0	0
26	0	2847	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0		0	0	0	0	0	0	0	0	0	0
30	0		0	126	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Total (kg)	**0**	**15,761**	**79,843**	**1,923**	**1,755**	**1**	**0**	**445**	**586**	**0**	**0**	**0**

2021 EPT Alum Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	0	0	0	2257	0	0	0
2	0	0	0	0	0	0	0	0	1094	0	0	0
3	0	0	3601	0	0	0	0	0	0	0	0	0
4	0	0	2942	0	0	1522	0	0	0	0	0	0
5	0	0	6071	0	0	0	0	0	0	0	0	0
6	0	0	187	0	0	0	3894	0	0	0	0	0
7	0	0	4075	0	1587	0	0	7368	0	0	0	0
8	0	0	0	0	14084	1378	0	0	0	0	0	3002
9	0	0	0	0	1401	3037	0	0	0	0	0	0
10	0	0	0	0	0	7498	0	0	3860	0	0	0
11	0	0	0	0	1561	1259	0	0	1011	0	0	0
12	0	0	4254	0	0	0	0	0	5512	0	0	0
13	0	0	5596	0	0	0	0	0	0	0	0	0
14	0	0	4002	0	0	1440	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	2643	0	0	0	0	0	0	0
18	0	0	0	1979	9398	0	0	0	0	0	0	0
19	0	0	0	0	17169	0	0	0	2476	0	0	0
20	0	0	0	0	1755	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1157	0	0	0	0	0
22	0	4717	0	0	0	0	8705	0	1385	0	0	0
23	0	0	0	0	0	0	0	21768	450	10941	0	0
24	0	0	2189	0	0	0	0	4156	0	948	0	0
25	0	0	0	0	0	0	0	0	0	960	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	2632	0	0	0	0	0	0	0
29	0		0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Total (kg)	**0**	**4,717**	**32,918**	**1,979**	**52,230**	**16,134**	**13,756**	**33,292**	**18,045**	**12,850**	**0**	**3,002**

2021 EPT Polymer Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	0	0	0	4	0	0	0
2	0	0	0	0	0	0	0	0	2	0	0	0
3	0	0	7	0	0	0	0	49	0	0	0	0
4	0	0	8	0	0	3	0	11	0	0	0	0
5	0	0	17	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	7	0	0	0	0	0
7	0	0	11	0	2	0	0	19	0	0	0	0
8	0	0	0	0	36	4	0	0	0	0	0	6
9	0	0	0	0	3	11	0	0	0	0	0	0
10	0	0	0	0	0	191	0	0	8	0	0	0
11	0	0	0	0	4	3	0	0	3	0	0	0
12	0	0	9	0	0	0	0	0	16	0	0	0
13	0	0	15	0	0	0	0	0	0	0	0	0
14	0	0	11	0	0	4	8	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	5	0	0	0	0	0	0	0
18	0	0	0	3	102	0	0	0	0	0	0	0
19	0	0	0	0	140	0	0	0	5	0	0	0
20	0	0	0	0	5	0	0	4	0	0	0	0
21	0	0	0	0	0	0	2	0	0	0	0	0
22	0	9	0	0	0	0	19	0	4	0	0	0
23	0	0	0	0	0	0	0	59	1	107	0	0
24	0	0	4	0	0	0	0	12	0	4	0	0
25	0	0	0	0	0	0	0	0	0	7	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	5	0	0	0	0	0	0	0
29	0		0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	55	0	0	0	0	0
31	0		0		0		0	0		0		0
Total (kg)	**0**	**9**	**82**	**3**	**302**	**216**	**90**	**155**	**42**	**118**	**0**	**6**

2021 DAF Polymer Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	19	30	36	36	32	36	25	29	37	33	38	25
2	18	33	37	31	33	36	24	28	35	40	34	24
3	18	32	35	30	40	27	25	25	29	34	36	24
4	20	27	31	28	42	29	23	27	34	29	34	27
5	21	23	25	30	41	30	23	27	40	19	35	26
6	19	21	22	28	44	29	21	27	42	33	40	27
7	20	21	24	27	38	29	24	20	44	19	40	25
8	17	22	36	28	28	30	24	17	19	23	37	24
9	15	24	20	27	29	29	23	19	34	34	32	29
10	16	23	4	30	38	25	25	22	35	41	33	30
11	30	24	17	34	38	21	24	29	35	37	30	30
12	34	25	31	31	41	24	24	29	37	42	33	32
13	30	27	32	26	45	26	25	30	36	37	31	32
14	31	28	31	26	41	23	26	30	36	34	33	33
15	24	28	24	30	36	25	24	30	40	34	33	26
16	27	28	22	31	36	27	56	33	40	34	32	28
17	27	29	25	36	38	25	32	35	41	39	30	25
18	27	22	31	40	35	26	32	35	41	39	30	27
19	23	24	33	33	28	26	31	32	45	38	31	29
20	21	32	32	13	24	29	31	34	53	37	31	28
21	21	36	30	41	23	29	32	33	49	38	32	29
22	23	34	29	42	26	29	30	31	32	37	36	28
23	24	28	24	32	28	29	30	28	20	37	38	23
24	22	28	19	33	37	27	33	33	23	36	37	26
25	20	15	20	41	38	24	31	43	30	38	33	28
26	19	47	22	46	41	24	29	37	28	38	30	25
27	25	49	29	32	42	24	30	36	30	38	28	24
28	26	37	36	30	42	23	30	33	31	39	27	24
29	23		36	27	42	23	30	25	31	41	24	25
30	24		23	34	44	24	30	27	30	39	25	29
31	24		40		40		29	33		38		31
Total (kg)	**708**	**797**	**856**	**953**	**1,131**	**808**	**876**	**917**	**1,057**	**1,095**	**983**	**843**

2021 Membrane Bleach Usage (L as delivered 16% sodium hypochlorite solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	643	356	296	453	438	286	410	613	695	801	586	443
2	477	485	337	352	194	426	326	625	550	740	689	538
3	637	535	174	469	550	439	469	498	489	632	766	356
4	520	568	543	484	472	354	371	349	630	535	785	442
5	521	604	368	307	361	444	433	577	578	645	688	327
6	644	539	427	378	289	619	486	607	562	551	725	404
7	573	265	420	472	737	448	471	459	561	575	701	470
8	399	339	416	185	206	514	331	307	853	632	627	434
9	477	487	338	466	269	477	479	520	591	607	675	488
10	353	344	448	444	261	406	392	611	750	458	719	609
11	464	624	358	205	251	369	425	555	773	681	642	443
12	569	358	354	374	459	510	417	470	565	511	720	580
13	638	346	296	453	378	359	656	431	739	547	640	493
14	447	395	300	199	160	481	441	437	766	561	559	622
15	518	326	324	469	366	619	426	570	868	554	652	461
16	462	311	516	602	517	588	725	420	681	500	799	633
17	567	363	389	283	417	544	487	688	531	658	787	490
18	486	337	445	397	389	661	440	548	311	576	763	609
19	486	270	398	458	504	488	742	610	452	348	719	592
20	407	353	564	167	213	645	536	683	458	493	728	490
21	559	258	513	378	323	594	624	426	497	481	571	607
22	566	217	420	435	560	554	443	515	386	364	624	718
23	459	292	305	246	468	549	478	349	716	535	511	534
24	502	374	235	292	504	603	502	420	373	611	673	594
25	376	324	414	245	482	569	657	265	396	527	431	411
26	336	323	387	186	366	557	459	381	674	529	558	265
27	516	273	233	256	705	458	494	560	355	460	431	285
28	428	291	504	575	486	354	659	323	728	452	532	294
29	382		320	232	424	283	558	560	663	609	481	385
30	481		299	405	434	592	466	51	727	383	579	416
31	416		409		548		606	72		410		367
Total (kg)	**15,313**	**10,555**	**11,747**	**10,868**	**12,732**	**14,793**	**15,411**	**14,500**	**17,918**	**16,968**	**19,361**	**14,798**

2021 Ostara Magnesium Chloride Usage (L as delivered 30% magnesium chloride solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	5413	5552	5944	6055	0	0	0
2	0	0	0	0	0	5378	5589	5739	6260	0	0	0
3	0	0	0	0	0	5228	5295	6276	6198	0	0	0
4	0	0	0	0	0	5172	5213	5343	6089	0	0	0
5	0	0	0	0	0	5113	5562	5919	6194	0	0	0
6	0	0	0	0	0	5304	5530	5859	6050	0	0	0
7	0	0	0	0	0	5167	6271	5850	6115	0	0	0
8	0	0	0	0	0	5094	6124	5986	6044	0	0	0
9	0	0	0	0	0	5248	6058	3174	6178	0	0	0
10	0	0	0	0	0	5306	5802	0	6227	0	0	0
11	0	0	0	0	0	5438	6187	0	6025	0	0	0
12	0	0	0	0	0	5442	5832	0	6002	0	0	0
13	0	0	0	0	0	5423	5531	0	6214	0	0	0
14	0	0	0	0	0	5275	6333	0	6918	0	0	0
15	0	0	0	0	0	4393	6128	0	7290	0	0	0
16	0	0	0	0	0	5328	6070	2395	6337	0	0	0
17	0	0	0	0	0	5091	6010	5866	6224	0	0	0
18	0	0	0	0	3381	5506	6001	5774	6229	0	0	0
19	0	0	0	0	4694	5208	4593	5732	6177	0	0	0
20	0	0	0	0	4615	5078	2645	5767	3370	0	0	0
21	0	0	0	0	4580	5195	6054	5663	3289	0	0	0
22	0	0	0	0	4297	5193	5870	5927	6432	0	0	0
23	0	0	0	0	4375	4616	6504	5580	6328	0	0	0
24	0	0	0	0	4736	5233	5757	5597	6743	0	0	0
25	0	0	0	0	3967	5398	6259	6265	6692	0	0	0
26	0	0	0	0	4720	5451	2953	5730	6930	0	0	0
27	0	0	0	0	4432	5162	3493	3977	6811	0	0	0
28	0	0	0	0	5003	5520	6212	6074	6542	0	0	0
29	0		0	0	5158	5321	5236	6059	6592	0	0	0
30	0		0	0	5198	5523	5919	6125	2308	0	0	0
31	0		0		5142		6328	5470		0		0
Total (kg)	**0**	**0**	**0**	**0**	**64,298**	**157,215**	**172,912**	**138,089**	**180,862**	**0**	**0**	**0**

2021 Ostara Caustic Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	422	535	625	562	0	0	0
2	0	0	0	0	0	481	604	621	403	0	0	0
3	0	0	0	0	0	399	481	580	573	0	0	0
4	0	0	0	0	0	416	500	608	606	0	0	0
5	0	0	0	0	0	523	655	559	582	0	0	0
6	0	0	0	0	0	492	409	416	653	0	0	0
7	0	0	0	0	0	486	889	470	640	0	0	0
8	0	0	0	0	0	315	727	338	619	0	0	0
9	0	0	0	0	0	406	641	264	641	0	0	0
10	0	0	0	0	0	465	685	0	634	0	0	0
11	0	0	0	0	0	463	699	0	607	0	0	0
12	0	0	0	0	0	572	711	0	589	0	0	0
13	0	0	0	0	0	449	646	0	670	0	0	0
14	0	0	0	0	0	491	544	0	726	0	0	0
15	0	0	0	0	0	336	669	0	686	0	0	0
16	0	0	0	0	0	524	593	99	683	0	0	0
17	0	0	0	0	0	399	590	413	689	0	0	0
18	0	0	0	0	208	514	626	417	591	0	0	0
19	0	0	0	0	355	389	462	342	695	0	0	0
20	0	0	0	0	277	386	302	414	469	0	0	0
21	0	0	0	0	230	535	675	398	315	0	0	0
22	0	0	0	0	221	371	710	315	792	0	0	0
23	0	0	0	0	216	372	786	434	796	0	0	0
24	0	0	0	0	224	563	748	495	847	0	0	0
25	0	0	0	0	252	583	797	576	1023	0	0	0
26	0	0	0	0	172	669	340	509	1047	0	0	0
27	0	0	0	0	232	409	585	321	1049	0	0	0
28	0	0	0	0	333	733	792	562	1175	0	0	0
29	0		0	0	350	607	514	485	1094	0	0	0
30	0		0	0	358	518	723	528	334	0	0	0
31	0		0		380		858	514		0		0
Total (kg)	**0**	**0**	**0**	**0**	**3,808**	**14,286**	**19,498**	**11,301**	**20,791**	**0**	**0**	**0**

Appendix C – Operations Monthly Reports

Gold Bar Wastewater Treatment Plant
10977 50 Street
Edmonton AB T6A 2E9
Canada
epcor.com

Approval 639-03-06
Gold Bar Waste Water Treatment Plant Operations Monthly Summary

2021

SENIOR MANAGER, OPERATIONS **MANAGER, OPERATIONS**	• **ALFREDO SUAREZ** • **KEN GROSSELL (LEVEL IV)**
LEVEL IV OPERATORS	• **TOM KWAN** • **DIEGO ESPINOSA** • **JANAKA LEKAMWASAM** • **MIKE NUNES** • **JODY PENNER**

January

- **0 secondary bypass events**
- **Supernatant on Jan 5th**
- **Drain Secondary 9 to replace broken flight Jan 6th**
- **Supernatant off to Capital Region Jan 7th**
- **Secondary 9 back in service Jan 9th**
- **Voltus shutdowns Jan 10th, 16th, & 26th**
- **Pre-screen 4 back in service/chain replaced Jan 12th**
- **Dewatered Secondary 3 for drive chain replacement Jan 13th**
- **Secondary 3 back in service Jan 14th**
- **Supernatant off Jan 18th**
- **Supernatant on Jan 25th, Capital Region set to 0.2 ML**
- **PMs complete on Blower 6 Jan 24th**
- **Fermenter Scrubber bleach pump 65314 tube replaced Jan 25th**
- **Blower 4 outboard bearing alarm Jan 27th – Maintenance confirmed vibration and it is accurate to reading**
- **Capital Region supernatant set to 0.4 ML**
- **Outfall 30 level transmitter reading high due to frost Jan 29th – Herman Nelson heater installed**
- **Broken shear pin Secondary 3 (Cell 2) Jan 29th**
- **Total dead duck count for Jan: 1**

February

- **1 secondary bypass event – Feb 22nd**
- **2 Voltus power shutdowns Feb 21st & 22nd**
- **Supernatant off to Capital Region Feb 1st**
- **Fermenter 1/2 sump pump replacement complete Feb 1st**
- **Supernatant off to Gold Bar Feb 2nd**
- **Secondary 9 RAS backup pump failed Feb 6th**
- **EPT H_2S detection I/O failure Feb 7th**
- **East Scrubber bleach pump PDP-65316 repaired Feb 7th**
- **Outfall 30 frozen including sump pump – adding heat Feb 8th**
- **Fermenter 1 TPS pump 28432 flushed and locked out for repair Feb 8th**
- **Bleach transfer line cracked – using totes at membrane Feb 9th – repaired Feb 12th**
- **Secondary 3 drive chain missing (Cell 3) Feb 9th**
- **Secondary 1 (Cell 3) drive chain broken Feb 9th**
- **Drained Secondary 3 to replace drive chain Feb 10th**
- **Secondary 3 back in service Feb 11th**
- **Prescreen 5 jammed Feb 16th – back in service Feb 17th**
- **PE sampler failed – no power Feb 17th**
- **Raw backup sampler plugged – cleaned out Feb 18th**
- **Outfall 20 frozen – adding heat Feb 19th**
- **Hydraulic uplift on secondary clarifiers Feb 21st – high flows**
- **Hydraulic uplift on secondary clarifiers Feb 25th – high flows**
- **UV outage Feb 24th & 25th**
- **Bio 7 (Cell 8) diffuser header broke off – Feb 27th**
- **Total dead duck count for Feb: 49**

March

- **8 secondary bypass events – Mar 3rd, 4th, 5th, 7th, 12th, 13th, 14th, & 24th**
- **Channel 3, Grit Tank 6 & 7, and EPT 9 & 10 back in service Mar 1st**
- **Screen 1 O/S for repair Mar 1st**
- **Fermenter Scrubber bleach pump 65314 tube repaired Mar 2nd**
- **Grit Tank 1 emptied for cleaning Mar 2nd**
- **Fermenter 1 TPS pump 28432 restored – duty pump Mar 3rd**
- **Rupture disk for north blend tank blew Mar 4th**
- **Solids shutdown – flush line with FE to lagoons Mar 4th**
- **Bio 7 dewatered to repair air line Mar 7th**
- **Bio 7 air line repaired – back in service Mar 9th**
- **Bios 1-5 and 6-8 in winter mode Mar 10th**
- **Supernatant on Mar 15th**
- **West Scrubber offline for 3 hours for flange repair Mar 15th**
- **TPS pump 28507 for Fermenter 2 broken bolt – repaired Mar 16th**
- **EPT 10 breaking shear pins – O/S Mar 18th**
- **Secondary 9 O/S and drained for FE line repair Mar 22nd – back in service Mar 25th**
- **Voltus shutdowns Mar 22nd & 28th**

- **Solids shutdown for 3 hours Mar 30th**
- **Total dead duck count for Mar: 5**

April

- **1 secondary bypass event – Apr 18th**
- **EPT 9 west collector drive shear pin breaking Apr 1st**
- **Bios 1-8 in winter mode Apr 1st**
- **West PE channel O/S dewatered for inspection Apr 3rd**
- **Voltus shutdown Apr 4th & 6th**
- **Loop 4 glycol leak, loop drained for repair Apr 9th**
- **Drain Secondary Clarifier 1 for chain/flight repair Apr 11th**
- **EPT 9/10 dewatered for repair Apr 13th**
- **Secondary 1 back in service Apr 16th**
- **GRF 2 trucks in to test new grit pumps Apr 16th & 21st**
- **Secondary 10 O/S for chain replacement Apr 18th**
- **Solids shutdown April 20th**
- **Bios 1-8 back in summer mode Apr 24th**

May

- **6 Secondary Bypass Events – May 7th – 9th, 11th, 17th, 18th, 18th – 20th, & 28th**
- **GRF – 3 trucks**
- **Thinning Sec 10 for chain replacement – May 2nd**
- **Fermenter Scrubber shutdown – 2 hrs – May 3rd**
- **Supernatant return increase to 2.2 MLD – May 4th**
- **Dig 3 mixer off – bearing issue – May 5th**
- **Ostara startup flow 2.6 MLD – May 6th**
- **Supernatant return increase to 2.8 MLD – May 7th**
- **Pre-screen 5 plugged – back in service same day – May 8th**
- **Primary 6 broken cross collector chain – May 8th**
- **East Scrubber bleach pump 65315 tube failure – May 11th**
- **Fermenter 4 filling with FE to start commissioning – May 11th**
- **Filling EPT 9/10 May 12th – back in service May 13th**
- **GRF plugged after 2nd truck – May 13th**
- **Primary 5/6 dewatered – May 15th**
- **Fermenter Scrubber bleach pump 65314 tube failure – May 16th**
- **Broken potable water line in UV building – fixed same day – May 18th**
- **Sec 10 back in full service – May 24th**
- **Supernatant return to 3.7 MLD – May 25th**
- **Primary 5/6 back in full service – May 26th**
- **Primary 7/8 O/S for influent gate inspection/repair – May 26th**
- **Membrane product water line superchlorination – May 27th**
- **2 Voltus shutdowns – May 26th & 27th**

June

- **5 Secondary Bypass Events June 4th, 8th, 9th, 10th – 11th, & 14th.**

- **Prim 7 back in service after influent channel gate repair – June 1st**
- **Boiler house 1 shutdown for seasonal work – June 1st**
- **Sec 3 O/S for projects – June 1st**
- **Train C check valve replaced – back to Operations – June 6th**
- **Product water pump 26632 check valve replaced – back to Operations – June 6th**
- **Temp VFD installed for bio 11 influent pump – June 7th**
- **Capital Region flow set to 0.7 ML from 0.5 ML – June 8th**
- **EPT poly line plugged – June 12th**
- **South blend tank rupture disk replaced – June 15th**
- **Prim 3 O/S for chain/flight repair – June 16th**
- **Flushed EPT poly lines with mineral oil and replaced liquid poly – June 17th**
- **GRF incline auger broke – June 18th**
- **Prim 3 back in service – June 17th**
- **Sec 8 shear pin failure – replaced – June 18th**
- **Pre treatment screen 3 sprocket issue – June 19th**
- **Pre treatment screen 3 sprocket repaired – June 22nd**
- **Prim 4 chain out of time – prim lowered to repair – June 22nd**
- **Sec 11 bio influent pump VFD replaced – June 25th**
- **Broken shear pin sec 4 – cell 4 – 4 failures, needs new hub – June26th**
- **Ferm 1 west TPS pump broken shear pin – running with 3 pistons – June 28th**
- **Grit 4/5 prescreen horizontal conveyor belts replaced – June 28th**
- **Prim 8 filling/ back in service – June 28th**
- **Broken belts on carbon scrubber/ replaced June 29th**
- **2 Trucks to GRF – June18th**

July

- **3 Secondary bypass event – July 6th, July 21st-22nd, July 22nd.**
- **3 Voltus shutdowns – July 7th, 18th & 21st.**
- **Ferm caustic pump PDP-65322 repaired – July 4th**
- **Solids shutdown for 2 hours to inspect check valve for dig 1 – July 6th**
- **Fermenter 1 O/S for TPS pumps repair – July 7th**
- **Water main break by dig ½ & prim ½ - July 9th**
- **Prim 7 O/S for inspection – July 10th**
- **Capital region supernatant increase from 0.6 ML to 0.8 ML – July 13th**
- **Dig 3 dye testing started – July 14th**
- **Sec 5 O/S for weir coating warrant work – July 16th**
- **1 vac truck to GRF – July 16th**
- **U.V. power shutdown for transformer switch – July 19th**
- **Dig 3 mixer 48673 seal leaking – shut off – July 20th – back in service July 21st**
- **Sec Bypass gates 2735/36 communication failure-running gates in manual – July 22nd.**
- **Ferm scrubber bleach pump 65313 tube failure – July 26th**
- **GRF 1 truck – July 28th**
- **Ostara power failure – July 29th**
- **Grit tank 6 west auger leaking – July 29th**

- **EPT poly plugged – July 30th**

August

- **3 Secondary Bypass Events – Sept 7th, 23rd, 23rd – 24th.**
- **1 Main Plant Bypass Event Aug 7th**
- **Broke shear pin – sec 4 – cell 4 – Aug 1st**
- **EPT Poly Plugged – Aug 3rd**
- **North blend tank rupture disk failed – Aug 4th**
- **West scrubber recirc pump replaced – Aug 4th**
- **Power Outage – Aug 4th**
- **Fermenter bleach pump tube failure – Aug 6th**
- **Sec 5 back in service – Aug 8th**
- **West and EPT scrubber shutdown for 8 hours – Aug 9th**
- **RAS 11 failure – using RAS 10 for sec 11 – Aug 10th**
- **Broken shear pin sec 4 – Cell 4 – Aug 18th**
- **RAS 7 motor replaced – Aug 20th**
- **Grit 5 incline auger seized – Aug 20th**
- **Outfall 10 sampler failed – backup sampler working – Aug 20th**
- **Primary 7 back in service Aug 27th**
- **Supernatant pump failure – Aug 27th**
- **Sec 6 draining for chain tightening/inspection – Aug 28th**
- **Membrane shutdown – Aug 30th**

September

- **6 Secondary Bypass Events – Sept 2nd, 9th – 10th ,11th, 12th, 19th, & 22nd.**
- **10 Trucks to GRF**
- **Voltus shutdown – Sept 1st & 17th**
- **Outfall 20 heat trace complete – Sept 2nd**
- **Sec 6 back in service after inspection – Sept 4th**
- **Primary 5 O/S for inspection – Sept 6th**
- **10 loads of alum delivered to EPT before diversion structure shutdown**
- **Odor complaint – Sept 7th**
- **Sec 5 O/S for RAS discharge valve replacement – Sept 9th, back in service Sept 9th**
- **U.V. Channel lead rotation – channel 1 now lag 3 for ecoli troubleshooting – Sept 15th**
- **Bio 8 recycle pump replaced – Sept 16th**
- **4 totes of bleach delivered to prepare for bleach storage tank gasket replacement – Sept 18th**
- **Power bump, loss of some equipment – Sept 18th**
- **Sec 7 O/S for chain tightening – Sept 20th**
- **Boiler house 1 running 1 boiler for building heat – Sept 21st**
- **Sec 7 back in service – Sept 23rd**
- **Primary 5 in service – Sept 24th**
- **Primary 6 O/S for chain replacement – Sept 26th**

- **Influent channel 2, grit 4/5 O/S and drained for pre-screen inspection – Sept 28th**
- **K102 O/S for inspection – Sept 28th**
- **Recycle pump for bio 2 VFD failure – running temporary VFD – Sept 29th**
- **K102 purged and back to Operations – Sept 30th**

October

- **1 secondary Bypass event Oct 23rd – 24th**
- **7 trucks to the GRF**
- **1 Voltus shutdown – Oct 24th**
- **Changed to backup waste pump for sec 10 – Oct 1st**
- **Dig 7 recirc pump seal leaking – Oct 1st**
- **Channel 2, grit tank 4/5 back in service – Oct 1st**
- **Channel 3, grit tank 6/7 O/S until end of Feb for diversion structure work – Oct 1st**
- **East/West bleach storage tanks gaskets replaced – oct 1st**
- **Tube failure ferm bleach pump PDP 65313 – Oct 4th**
- **East primary influent channel drained for inspection – Oct 4th**
- **Raw auto sampler failed – using backup sampler – Oct 5th**
- **Sec 10 cell 1 shear pin failed – Oct 5th**
- **EPT Poly delivered to poly room – Oct 5th**
- **Ferm bleach pump tube failure PDP 65314 – Oct 7th**
- **EPT Poly mineral oil flush complete – Oct 7th**
- **Broken shear pin DAF 1 – Oct 10th**
- **Primary 5 drained to inspect influent gate leakage – Oct 11th**
- **Drained sec 4 down 4ft for equalization valve replacement between sec ¾ - Oct 14th**
- **Outfall 10 south sampler failed – using north sampler for results – Oct 14th**
- **East primary influent channel, primary 7/8 back to Operations – Oct 14th**
- **No fence line monitoring completed – Oct 15th**
- **Sec 10 – cell 5 shear pin failed – Oct 17th**
- **Sec 8 – cell 3 shear pin failed – Oct 17th**
- **Suncor line repaired – Oct 23rd – failed again Oct 24th**
- **Plant power feed running off of Kennedale – Oct 25th**
- **Suncor repair completed again, back in service – Oct 28th**

November

- **0 Secondary Bypass Events**
- **1 Voltus Shutdown Nov 15th**
- **1 Dead Duck reported at U.V. screen**
- **Grit tank 6/7 LOTO for cleaning and inspection – Nov 1st**
- **RAS backup sampler plugged – Nov 2nd**
- **GRF O/S and winterized**
- **East scrubber caustic pump 65323 small leak – Nov 3rd**
- **Supernatant pumps tripped off – plugged check valve – Nov 6th**
- **F.E. backup sampler not counting # of samples but still sampling – Nov 9th**

- **Fermenter scrubber shutdown for projects – 10 hrs – Nov 9th**
- **Fermenter 1 TPS pump 28432 LOTO for Maintenance to repair – Nov 9th**
- **South spencer blower LOTO for Maintenance – Nov 9th**
- **East scrubber sump pumps plugged – using submersible – Nov 10th**
- **Fermenter bleach pump 65314 tube failure – Nov 12th**
- **P.E. sampler plugged – Nov 15th**
- **East scrubber off line for projects – 9 hours – Nov 18th**
- **Boiler house 2 utility water line froze – thawed hose and restarted feed – Nov 21st**
- **Acid clean and Cloverbar pump house – Nov 22nd**
- **Boiler 6 off line for cleaning and inspection – Nov 22nd**
- **U.V. channel 1 bulbs replaced – set as lag 2 channel – Nov 23rd**
- **Primary 5/6 full and back in service – Nov 24th**
- **Primary 7/8 O/S as it is not needed – Nov 24th**
- **Carbon scrubber 6/7 grit building shut off due to cold intake air temp – running on hand – Nov 24th**
- **Unplanned power outage from Hardisty feed – on Kennedale until 1:45 p.m. – switched back to Hardisty feed – Nov 25th**
- **Supernatant back on line after acid clean – Nov 26th**
- **North poly system plugged – using south poly system – Nov 26th**
- **East scrubber sump pump piping blew apart – using submersible pump – Nov 27th**
- **Ferm bleach pump 65313 tube failure – Nov 28th**
- **Pre-screen 4 bypassed due to scraper bar coming off of support – Nov 28th (fixed Nov 29th)**
- **Moving cassettes from train 5 to train 7 – Nov 29th**
- **Prim 8 cross collector shear pin failed – replaced – Nov 29th**
- **Blower 5 shutdown – un explained surge alarm came in – guide vanes 71% open – Nov 30th**

December

- **1 Secondary Bypass Event – Dec 8th**
- **2 Voltus shutdown – Dec 14th & Dec 27th**
- **13 Dead ducks found at U.V. total for Dec**
- **Transformer 18001 replaced/back in service/ blower ¼ tested – Dec 1st**
- **East scrubber sump pumps failed/broken pipes – using submersible – Dec 3rd**
- **West scrubber caustic pump tube replaced – Dec 6th**
- **Grit 6/7 carbon scrubber tripped due to low air temp, running on hand – Dec 6th**
- **Potable water line leak from projects flushing – samples taken outfall 20 _ Dec 7th**
- **Screens 7/8 O/S for mechanical inspection – Dec 7th**
- **VFA line to bio 6 control valve leaking – Dec 8th – repaired Dec 9th**
- **Raw sampler plugged – backup working – Dec 9th**
- **RAS 2 pump volute replaced/ hole in volute – Dec 9th**
- **Ferm bleach pump tube failure – Dec 12th**
- **West potable water line back to Ops from projects – Dec 14th**
- **East scrubber caustic pump 65322 tube failure – Dec 19th**

- **Dig 6 losing heat/low flow on recirc pump – planning for acid clean – Dec 19th**
- **Started seeding bio 3/ back to Operations – Dec 22nd**
- **Outfall 30 level transmitter high reading/possible ice – heater being installed – Dec 22nd.**
- **Sec 1 cell 3 & 5 flights out of alignment/broken chain – Dec 27th**
- **Screen 5 scrapper bar spring fell off – Dec 28th – back in service Dec 29th**
- **Prim 8 cross collector drive chain broke – repaired Dec 28th**
- **Screen 1 chain loose – repaired Dec 29th**
- **Sec 7 cell 2 chain broke – flights damaged – Dec 29th**

Appendix D – Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
January 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
January 1, 2021	9.51	670.5	0.47	4.2	9.50	700.3	4.55	0.1	9.50	682.3	5.08	0.0	9.50	699.7	1.7	210.0	21.1	-0.21	-0.14	0.1	0.0	384.1	
January 2, 2021	9.50	670.1	0.52	4.5	9.50	699.7	4.50	0.2	9.50	691.5	4.54	0.0	9.50	700.5	1.7	257.5	20.8	-0.21	-0.14	0.1	0.0	290.0	
January 3, 2021	9.50	670.3	0.39	3.5	9.50	699.9	4.61	0.2	9.50	686.2	4.11	0.3	9.50	699.6	1.3	87.4	20.2	-0.23	-0.15	0.1	0.0	211.0	
January 4, 2021	9.50	670.2	0.40	4.0	9.50	700.3	4.35	0.1	9.50	689.3	4.11	0.2	9.50	700.0	1.2	90.8	20.5	-0.22	-0.14	0.1	0.0	204.2	
January 5, 2021	9.50	669.6	0.48	4.0	9.51	700.0	4.14	0.0	9.50	690.5	4.30	0.0	9.50	695.7	1.6	195.3	20.4	-0.22	-0.14	0.1	0.0	284.6	0
January 6, 2021	9.49	670.2	0.45	3.4	9.50	700.8	4.27	0.1	9.50	706.7	2.84	0.0	9.50	668.9	1.1	99.9	20.4	-0.22	-0.14	0.1	0.0	308.6	
January 7, 2021	9.50	671.1	0.56	3.3	9.50	699.0	4.31	0.2	9.50	681.9	1.54	0.1	9.50	700.2	1.8	258.5	20.3	-0.22	-0.13	0.1	0.0	565.4	
January 8, 2021	9.51	670.8	0.36	1.3	9.50	700.0	4.69	0.1	9.50	705.1	0.68	0.8	9.51	700.5	1.2	155.7	20.2	-0.21	-0.13	0.1	0.0	308.1	
January 9, 2021	9.50	670.0	0.46	0.0	9.50	699.4	5.22	0.2	9.49	717.5	0.86	0.1	9.50	700.0	1.3	135.7	20.2	-0.22	-0.14	0.1	0.0	347.1	
January 10, 2021	9.49	669.2	0.52	0.0	9.50	699.8	5.53	0.2	9.51	715.0	0.91	0.2	9.50	699.9	1.3	154.4	20.2	-0.21	-0.13	0.1	0.0	412.7	
January 11, 2021	9.50	670.2	0.48	0.0	9.50	700.3	5.56	0.2	9.50	695.1	0.93	0.4	9.50	701.0	1.3	136.6	20.6	-0.21	-0.14	0.1	0.0	297.6	
January 12, 2021	9.51	670.2	0.51	0.0	9.50	700.3	5.32	0.2	9.50	696.7	1.74	0.1	9.50	699.8	1.5	190.9	20.6	-0.22	-0.14	0.1	0.0	241.6	
January 13, 2021	9.50	670.1	0.51	0.0	9.50	700.1	5.19	0.3	9.50	695.7	10.32	3.8	9.50	700.3	1.4	147.1	20.2	-0.21	-0.14	0.1	0.0	268.9	0
January 14, 2021	9.51	673.5	0.44	0.0	9.51	703.4	4.97	0.2	9.52	714.4	0.24	15.9	9.50	710.4	1.0	92.1	20.4	-0.22	-0.14	0.1	0.0	281.2	
January 15, 2021	9.50	669.7	0.30	0.0	9.50	700.0	4.33	0.3	9.50	690.3	0.28	49.0	9.50	699.4	1.3	146.6	20.3	-0.22	-0.14	0.1	0.0	256.8	
January 16, 2021	9.50	669.6	0.25	0.0	9.50	699.7	4.69	0.4	9.50	691.1	0.28	40.7	9.50	699.7	1.3	135.4	20.3	-0.23	-0.14	0.1	0.0	296.6	
January 17, 2021	9.50	669.9	0.22	0.0	9.51	700.2	4.80	0.4	9.50	700.6	0.23	68.2	9.50	700.5	1.3	133.6	19.9	-0.21	-0.14	0.1	0.0	232.2	
January 18, 2021	9.50	670.5	0.19	0.0	9.50	700.1	4.28	0.4	9.50	707.7	0.15	29.2	9.50	700.4	0.9	78.9	20.1	0.17	-0.37	0.1	0.0	235.1	
January 19, 2021	9.50	669.3	0.37	0.0	9.50	700.2	4.55	0.4	9.50	696.8	0.20	57.1	9.50	699.6	1.2	150.9	20.4	0.18	-0.37	0.1	0.0	296.0	0
January 20, 2021	9.50	670.6	0.39	0.0	9.50	700.1	4.18	0.4	9.50	699.7	0.20	60.4	9.50	699.9	1.2	170.6	19.9	0.17	-0.37	0.1	0.0	406.1	
January 21, 2021	9.50	670.3	0.33	0.0	9.50	700.5	4.02	0.4	9.50	696.4	0.17	36.9	9.50	700.6	1.0	92.9	20.3	0.18	-0.37	0.1	0.0	202.0	
January 22, 2021	9.50	670.2	0.47	0.0	9.51	700.1	3.96	0.5	9.50	707.3	0.15	38.9	9.50	700.4	1.2	164.4	20.3	0.18	-0.37	0.0	0.0	290.3	
January 23, 2021	9.51	669.8	0.37	1.1	9.50	700.0	3.57	0.4	9.50	715.9	0.15	48.2	9.50	700.0	1.3	233.2	20.6	-0.09	-0.15	0.1	0.0	267.2	
January 24, 2021	9.50	669.9	0.39	3.0	9.50	700.2	3.35	0.4	9.50	703.6	0.19	68.2	9.50	700.1	1.4	335.6	22.1	-0.34	0.03	0.1	0.0	386.7	
January 25, 2021	9.46	670.7	0.22	1.7	9.49	699.9	3.14	0.4	9.50	699.3	0.14	61.4	9.50	699.8	1.2	223.1	22.5	-0.34	0.04	0.1	0.0	302.1	
January 26, 2021	9.50	677.9	0.22	1.8	9.50	700.4	3.11	0.5	9.50	702.1	0.07	45.1	9.50	700.1	1.2	219.1	22.4	-0.34	0.03	0.2	0.0	230.1	
January 27, 2021	9.51	670.7	0.26	2.1	9.50	699.9	3.06	0.4	9.50	704.0	0.02	32.5	9.50	700.5	1.2	202.0	22.0	-0.34	0.02	0.1	0.0	204.6	0
January 28, 2021	9.50	670.7	0.09	0.5	9.50	695.0	2.77	0.3	9.49	720.2	0.01	17.9	9.50	701.7	0.9	127.0	22.2	-0.34	0.02	0.1	0.0	161.8	
January 29, 2021	9.48	678.2	0.10	1.6	9.50	701.5	3.02	0.5	9.50	701.7	0.01	13.4	9.50	699.8	1.1	218.8	22.1	-0.33	0.02	0.1	0.0	223.0	
January 30, 2021	9.51	670.5	0.10	0.1	9.50	700.1	2.70	0.4	9.50	697.3	0.02	10.5	9.50	700.1	1.2	240.7	21.8	-0.34	0.01	0.1	0.0	234.0	
January 31, 2021	9.50	669.8	0.12	0.3	9.50	700.0	2.69	0.3	9.50	698.8	0.00	8.6	9.50	700.3	1.0	139.3	21.9	-0.34	0.02	0.1	0.0	172.1	
Avg	9.50	670.8	0.35	1.3	9.50	700.0	4.17	0.3	9.50	700.0	1.43	22.8	9.50	699.3	1.3	168.5	20.8	-0.18	-0.13	0.1	0.0	283.9	0
Min	9.46	669.2	0.09	0.0	9.49	695.0	2.69	0.0	9.49	681.9	0.00	0.0	9.50	668.9	0.9	78.9	19.9	-0.34	-0.37	0.0	0.0	161.8	0
Max	9.51	678.2	0.56	4.5	9.51	703.4	5.56	0.5	9.52	720.2	10.32	68.2	9.51	710.4	1.8	335.6	22.5	0.18	0.04	0.2	0.0	565.4	0

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
February 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
February 1, 2021	9.50	670.4	0.13	0.2	9.50	699.8	2.72	0.4	9.50	704.1	0.00	7.7	9.50	700.2	0.9	141.5	21.9	-0.34	0.02	0.1	0.0	131.1	
February 2, 2021	9.50	669.4	0.29	0.3	9.50	699.7	2.96	0.4	9.50	701.8	0.00	8.6	9.50	700.1	1.0	141.4	21.8	-0.34	0.02	0.1	0.0	242.0	
February 3, 2021	9.50	670.3	0.42	0.2	9.50	699.8	3.27	0.5	9.50	701.3	0.00	11.9	9.50	700.2	1.1	217.7	21.9	-0.34	0.03	0.1	0.0	237.0	0
February 4, 2021	9.50	669.8	0.32	0.0	9.50	698.4	3.15	0.5	9.50	699.0	0.00	7.9	9.50	700.0	1.0	161.8	22.2	-0.34	0.02	0.1	0.0	123.8	
February 5, 2021	9.50	670.2	0.34	0.5	9.50	700.6	2.89	0.5	9.50	700.1	0.00	10.4	9.50	700.4	1.1	265.6	22.3	-0.34	0.03	0.1	0.0	164.8	
February 6, 2021	9.49	672.4	0.17	0.5	9.50	699.7	2.83	0.5	9.50	706.3	0.00	5.9	9.50	700.3	1.1	259.0	22.8	-0.34	0.03	0.1	0.0	326.9	
February 7, 2021	9.51	672.4	0.18	1.8	9.50	700.1	2.53	0.4	9.50	699.6	0.10	6.2	9.50	700.2	1.1	477.3	22.1	-0.34	0.03	0.1	0.0	337.4	
February 8, 2021	9.52	671.3	0.09	0.2	9.50	699.8	2.48	0.3	9.50	706.8	0.00	4.1	9.50	700.7	1.0	406.4	22.5	-0.34	0.02	0.1	0.0	293.9	
February 9, 2021	9.50	669.7	0.20	0.1	9.51	701.3	1.45	0.1	9.50	703.8	0.19	3.8	9.50	700.6	1.2	233.5	22.4	-0.35	0.02	0.1	0.0	298.2	
February 10, 2021	9.54	672.8	0.25	0.6	9.55	701.0	0.38	0.0	9.51	707.4	0.00	2.5	9.50	710.0	1.4	18.5	22.7	-0.35	0.02	0.1	0.0	255.8	0
February 11, 2021	9.49	670.1	0.35	1.9	9.55	700.1	0.29	0.0	9.50	706.1	0.00	1.6	9.50	700.5	0.9	40.5	22.9	-0.34	0.01	0.1	0.0	319.0	
February 12, 2021	9.50	669.9	0.40	0.7	9.50	700.1	0.28	0.0	9.47	668.6	0.00	7.3	9.50	700.4	0.8	113.2	22.8	-0.34	0.01	0.1	0.0	254.9	
February 13, 2021	9.50	669.5	0.51	2.0	9.50	699.9	0.24	0.0	9.80	674.0	0.03	108.3	9.50	700.0	1.1	113.8	22.5	-0.35	0.03	0.1	0.0	328.4	
February 14, 2021	9.50	669.6	0.48	1.5	9.50	699.8	0.41	0.1	9.54	674.4	0.00	45.4	9.50	699.8	1.0	47.5	22.6	-0.34	0.02	0.1	0.0	293.3	
February 15, 2021	9.50	670.6	0.57	1.0	9.50	700.0	0.47	0.1	9.49	703.0	0.00	5.6	9.50	700.3	1.3	101.3	22.2	-0.34	0.02	0.1	0.0	256.6	
February 16, 2021	9.50	670.4	0.41	0.3	9.50	700.1	0.36	9.0	9.50	700.5	0.00	3.5	9.50	700.5	0.8	141.4	22.4	-0.33	0.02	0.1	0.0	159.4	
February 17, 2021	9.50	669.9	0.35	0.1	9.50	700.0	0.41	14.7	9.50	700.2	0.00	1.1	9.50	700.6	0.7	71.5	22.0	-0.34	0.03	0.1	0.0	145.0	
February 18, 2021	9.50	669.7	0.43	0.0	9.49	698.1	1.31	57.6	9.50	688.3	0.00	2.9	9.50	700.2	0.8	63.5	21.7	-0.34	0.02	0.1	0.0	135.2	
February 19, 2021	9.50	670.1	0.55	0.2	9.50	699.4	3.00	81.0	9.49	694.3	1.21	9.3	9.49	700.3	0.9	25.4	21.6	-0.34	0.02	0.1	0.0	177.2	
February 20, 2021	9.50	670.2	0.43	0.0	9.50	700.0	2.92	65.4	9.50	697.9	2.88	16.3	9.50	700.2	1.0	7.2	21.5	-0.35	0.01	0.1	0.0	109.2	0
February 21, 2021	9.50	669.7	0.36	0.0	9.50	700.0	3.17	70.8	9.50	703.6	2.62	11.4	9.50	700.3	0.9	1.5	21.1	-0.36	0.01	0.1	0.0	97.5	
February 22, 2021	9.51	671.5	0.11	0.0	9.50	700.3	2.97	207.4	9.51	714.8	1.76	5.5	9.50	699.9	1.1	9.6	20.5	-0.37	0.01	0.1	0.0	78.3	
February 23, 2021	9.50	669.4	0.01	0.0	9.51	700.3	2.39	186.4	9.50	697.5	1.28	1.4	9.50	701.1	0.5	8.7	21.0	-0.37	0.01	0.1	0.0	73.7	
February 24, 2021	9.50	670.6	0.07	3.5	9.50	700.2	1.00	234.7	9.49	693.6	1.60	3.8	9.50	701.8	0.6	37.3	21.1	-0.37	0.02	0.1	0.0	82.0	
February 25, 2021	9.50	669.9	0.00	0.4	9.50	700.3	0.57	514.9	9.50	703.7	1.91	0.0	9.50	700.3	0.7	0.0	20.5	-0.36	0.01	0.1	0.0	83.2	
February 26, 2021	9.50	669.1	0.00	0.0	9.50	700.2	1.80	1567.3	9.51	696.5	1.53	0.2	9.50	699.9	0.8	0.0	21.0	-0.34	0.02	0.0	0.0	77.4	0
February 27, 2021	9.50	669.4	0.00	0.4	9.49	698.7	1.87	722.4	9.49	696.0	0.63	0.1	9.50	699.7	1.1	0.0	21.1	-0.35	0.02	0.1	0.0	82.1	
February 28, 2021	9.49	669.5	0.00	0.0	9.50	699.9	1.90	0.0	9.49	690.8	0.00	1.6	9.50	700.0	1.3	0.0	20.7	-0.35	0.02	0.1	0.0	88.6	
Avg	9.50	670.3	0.27	0.6	9.50	699.9	1.79	133.4	9.51	697.6	0.56	10.5	9.50	700.7	1.0	110.9	21.9	-0.35	0.02	0.1	0.0	187.6	0
Min	9.49	669.1	0.00	0.0	9.49	698.1	0.24	0.0	9.47	668.6	0.00	0.0	9.49	699.7	0.5	0.0	20.5	-0.37	0.01	0.0	0.0	73.7	0
Max	9.54	672.8	0.57	3.5	9.55	701.3	3.27	1567.3	9.80	714.8	2.88	108.3	9.50	710.0	1.4	477.3	22.9	-0.33	0.03	0.1	0.0	337.4	0

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
March 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
March 1, 2021	9.51	678.2	0.04	0.0	9.50	700.0	2.38	67.7	9.51	710.4	0.96	1.1	9.50	700.5	1.1	0.0	20.4	-0.36	0.01	0.1	2.6	84.4	
March 2, 2021	9.50	670.2	0.00	0.0	9.51	691.6	2.62	244.7	9.50	707.2	1.25	0.8	9.50	700.1	0.9	0.0	20.6	-0.36	0.01	0.1	4.5	103.2	
March 3, 2021	9.50	670.4	0.00	0.0	9.50	700.5	2.00	179.5	9.50	704.1	1.16	2.4	9.50	700.6	0.9	0.4	20.3	-0.37	0.01	0.1	2.4	120.3	
March 4, 2021	9.51	669.9	0.00	0.0	9.50	700.0	1.85	149.7	9.50	701.0	0.99	1.2	9.50	700.7	1.0	0.3	20.2	-0.36	0.02	0.1	2.0	102.0	
March 5, 2021	9.49	669.9	0.05	0.0	9.50	700.4	1.51	119.4	9.49	702.5	0.91	1.6	9.49	699.9	1.2	1.3	20.2	-0.37	0.01	0.1	0.4	81.9	0
March 6, 2021	9.50	670.2	0.00	0.0	9.50	699.1	1.64	155.3	9.50	710.0	0.79	0.5	9.50	700.3	0.9	0.0	20.2	-0.37	0.01	0.1	0.3	76.2	
March 7, 2021	9.50	669.7	0.00	0.0	9.50	700.6	2.99	237.1	9.49	690.5	0.97	1.1	9.48	698.2	1.2	0.8	20.3	-0.36	0.02	0.1	0.2	82.0	
March 8, 2021	9.51	672.2	0.01	0.0	9.50	699.7	1.86	155.4	9.51	700.1	0.85	0.2	9.52	701.8	0.7	0.0	20.6	-0.36	0.03	0.1	0.0	85.6	0
March 9, 2021	9.50	669.8	0.00	0.0	9.50	699.8	2.15	190.1	9.50	704.5	1.07	0.8	9.50	700.8	1.0	0.0	20.5	-0.36	0.01	0.1	0.5	91.4	
March 10, 2021	9.50	669.7	0.00	0.0	9.50	701.0	3.35	346.6	9.50	693.7	1.15	1.7	9.50	699.5	1.0	0.3	20.5	-0.35	0.02	0.1	0.3	98.2	
March 11, 2021	9.49	675.6	0.00	0.0	9.50	701.4	2.02	157.8	9.50	690.9	1.41	3.4	9.50	692.8	1.2	0.5	20.8	-0.35	0.01	0.1	0.0	111.9	
March 12, 2021	9.49	670.3	0.04	0.0	9.50	700.6	1.94	117.6	9.50	710.2	1.25	5.1	9.50	700.8	1.6	1.5	20.6	-0.48	0.05	0.1	0.0	109.4	
March 13, 2021	9.50	670.3	0.01	0.0	9.50	700.2	1.66	153.3	9.50	703.4	0.64	0.4	9.49	700.1	1.5	1.3	20.5	-0.37	0.38	0.1	0.0	100.9	
March 14, 2021	9.50	669.8	0.01	0.0	9.50	699.4	1.57	141.2	9.49	695.9	0.50	0.0	9.50	701.1	1.0	0.4	20.3	-0.36	0.38	0.1	0.0	100.3	
March 15, 2021	9.51	669.7	0.00	0.0	9.50	699.8	1.99	143.4	11.01	596.0	1.02	191.3	9.52	701.4	0.8	0.0	21.0	-0.36	0.38	0.1	0.0	107.8	
March 16, 2021	9.50	669.9	0.00	0.0	9.50	700.1	1.91	106.5	9.66	718.9	1.15	1.8	9.50	700.3	1.7	0.3	20.8	-0.36	0.38	0.1	0.0	105.4	
March 17, 2021	9.50	669.8	0.00	0.0	9.50	699.7	2.29	111.8	9.49	695.6	1.27	0.4	9.50	699.7	1.7	1.0	20.5	-0.36	0.38	0.1	0.0	92.6	0
March 18, 2021	9.50	669.8	0.00	0.0	9.50	699.9	2.46	121.1	9.50	698.2	1.38	0.1	9.50	699.9	1.6	0.7	20.8	-0.37	0.38	0.1	0.0	84.9	
March 19, 2021	9.50	670.0	0.00	0.0	9.50	700.1	2.47	133.0	9.51	698.8	1.44	0.1	9.50	699.7	1.7	0.6	20.4	-0.37	0.38	0.1	0.0	92.4	
March 20, 2021	9.47	669.0	0.00	0.0	9.50	699.8	2.37	124.2	9.49	728.6	1.72	0.2	9.50	699.6	2.2	0.5	20.6	-0.36	0.38	0.1	0.0	98.3	
March 21, 2021	9.50	668.5	0.00	0.0	9.50	699.9	2.75	149.9	9.48	726.5	2.03	0.1	9.50	699.9	2.2	2.1	20.8	-0.36	0.38	0.1	0.0	118.3	
March 22, 2021	9.49	668.5	0.00	0.0	9.50	700.3	2.75	128.6	9.52	713.9	1.93	0.1	9.50	700.0	2.1	19.5	21.0	-0.36	0.38	0.1	0.0	102.6	
March 23, 2021	9.50	668.5	0.00	0.0	9.50	699.6	2.73	119.4	9.49	686.1	2.29	4.0	9.50	699.8	2.3	0.9	21.0	-0.36	0.38	0.1	0.0	109.7	
March 24, 2021	9.50	690.5	0.00	0.0	9.49	697.3	3.77	291.2	9.53	691.9	2.01	10.5	9.51	705.0	2.7	5.6	18.1	-0.38	0.39	0.1	0.0	109.2	0
March 25, 2021	9.53	677.2	0.00	0.0	9.50	700.5	3.54	254.3	9.50	712.2	1.16	2.3	9.50	700.5	1.4	4.4	21.6	-0.32	0.54	0.0	1.5	97.2	
March 26, 2021	9.50	666.0	0.00	0.0	9.50	699.1	3.75	276.6	9.49	694.2	1.73	6.4	9.50	699.3	2.0	9.8	19.7	-0.19	0.69	0.1	0.1	156.2	
March 27, 2021	9.50	669.8	0.00	0.0	9.51	700.8	3.97	257.4	9.51	698.0	1.81	4.2	9.50	700.1	2.5	11.5	19.5	-0.19	0.68	0.1	0.0	247.6	
March 28, 2021	9.50	669.8	0.10	0.0	9.50	699.7	3.48	222.4	9.50	722.9	1.96	5.9	9.50	699.9	2.2	0.5	19.8	-0.20	0.67	0.1	0.0	258.5	
March 29, 2021	9.50	670.1	0.04	0.0	9.51	700.7	2.80	166.2	9.50	713.6	1.32	3.8	9.50	700.9	1.6	2.8	20.0	-0.19	0.68	0.1	0.0	123.4	
March 30, 2021	9.50	670.1	0.00	0.0	9.50	699.2	2.58	171.0	9.49	696.9	1.37	2.0	9.50	699.7	1.7	6.2	19.8	-0.19	0.68	0.1	0.0	149.7	0
March 31, 2021	9.50	670.0	0.00	0.0	9.50	701.3	3.25	174.8	9.51	696.3	1.39	0.8	9.50	700.0	1.8	9.6	19.5	-0.20	0.69	0.1	0.0	147.9	
Avg	9.50	671.1	0.01	0.0	9.50	699.7	2.53	173.1	9.55	700.4	1.32	8.2	9.50	700.1	1.5	2.7	20.4	-0.33	0.30	0.1	0.5	114.5	0
Min	9.47	666.0	0.00	0.0	9.49	691.6	1.51	67.7	9.48	596.0	0.50	0.0	9.48	692.8	0.7	0.0	18.1	-0.48	0.01	0.0	0.0	76.2	0
Max	9.53	690.5	0.10	0.0	9.51	701.4	3.97	346.6	11.01	728.6	2.29	191.3	9.52	705.0	2.7	19.5	21.6	-0.19	0.69	0.1	4.5	258.5	0

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
April 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
April 1, 2021	9.50	670.2	0.03	0.0	9.50	700.1	3.68	400.1	9.50	698.0	1.73	8.7	9.50	700.4	1.9	0.4	19.4	-0.20	0.67	0.1	0.0	190.7	
April 2, 2021	9.50	669.5	0.04	0.0	9.50	699.7	3.21	302.0	9.49	696.3	2.28	13.6	9.50	698.8	1.5	3.6	19.7	-0.20	0.68	0.1	0.0	252.2	
April 3, 2021	9.49	670.2	0.23	0.0	9.50	699.6	3.56	285.7	9.50	701.3	2.24	4.8	9.50	699.2	2.0	4.4	19.6	-0.20	0.68	0.1	0.0	233.3	
April 4, 2021	9.50	669.4	0.32	0.0	9.50	699.6	4.15	289.8	9.49	679.5	3.39	29.9	9.49	698.5	2.6	8.3	19.9	-0.20	0.68	0.1	0.0	373.1	
April 5, 2021	9.50	670.1	0.33	0.0	9.50	699.8	4.35	294.9	9.50	700.3	3.80	21.7	9.50	700.0	2.6	12.6	19.6	-0.20	0.68	0.1	0.0	369.0	
April 6, 2021	9.50	670.3	0.32	0.0	9.50	700.2	3.99	248.0	9.50	704.3	3.39	16.5	9.50	700.4	2.6	16.5	19.4	-0.19	0.68	0.1	0.0	288.4	
April 7, 2021	9.50	669.8	0.29	0.0	9.50	699.8	4.36	265.6	9.50	704.1	2.86	18.1	9.50	699.6	2.6	20.3	19.3	-0.21	0.68	0.1	0.0	214.9	0
April 8, 2021	9.50	670.2	0.23	0.0	9.40	699.4	4.12	525.2	9.48	703.1	3.00	14.0	9.49	699.4	2.7	18.2	19.5	-0.20	0.67	0.1	0.0	249.2	
April 9, 2021	9.50	670.0	0.23	0.0	9.50	699.7	4.99	254.3	9.50	706.2	2.76	2.7	9.50	700.2	2.8	14.8	19.6	-0.20	0.67	0.1	0.0	291.2	
April 10, 2021	9.51	670.6	0.21	0.0	9.50	699.9	4.75	168.4	9.50	704.1	2.42	7.3	9.50	700.5	2.8	12.8	19.8	-0.19	0.67	0.1	0.0	227.9	
April 11, 2021	9.50	670.2	0.00	0.0	9.51	700.7	3.59	100.5	9.49	722.0	0.76	0.6	9.50	694.2	1.5	4.7	19.6	-0.19	0.69	0.1	0.0	87.7	
April 12, 2021	9.49	669.6	0.00	0.0	9.51	700.7	3.14	80.3	9.50	692.6	1.10	1.9	9.50	699.6	0.5	1.7	19.7	-0.19	0.70	0.1	0.0	95.6	
April 13, 2021	9.50	670.4	0.00	0.0	9.49	697.4	3.80	155.3	9.49	678.0	2.82	5.5	9.50	701.2	0.6	3.3	19.8	-0.20	0.69	0.1	0.0	230.7	0
April 14, 2021	9.50	669.7	0.00	0.0	9.50	700.9	5.09	190.8	9.49	674.6	4.92	27.7	9.50	700.7	0.5	7.3	19.4	-0.21	0.68	0.1	0.0	513.3	
April 15, 2021	9.50	669.7	0.00	0.0	9.50	700.9	4.10	204.8	9.51	720.7	3.85	4.6	9.50	700.7	0.8	8.0	19.3	-0.21	0.69	0.1	0.0	419.5	
April 16, 2021	9.50	669.9	0.00	0.0	9.50	700.8	3.72	200.2	9.51	708.1	2.02	2.7	9.50	699.9	0.8	6.1	19.4	-0.21	0.68	0.1	0.0	225.6	
April 17, 2021	9.50	670.3	0.00	0.0	9.51	700.7	3.38	362.7	9.51	691.0	2.21	4.5	9.50	699.9	0.9	3.5	19.2	-0.21	0.63	0.1	0.0	173.4	
April 18, 2021	9.50	673.3	0.22	0.0	9.49	699.0	4.02	420.8	9.49	709.1	1.08	2.6	9.50	704.3	0.6	4.3	19.7	-0.19	0.73	0.1	0.0	67.2	
April 19, 2021	9.51	674.2	0.00	0.0	9.50	701.6	5.05	459.1	9.52	702.2	1.94	5.2	9.49	706.5	0.7	1.5	19.4	-0.20	0.73	0.1	0.0	70.3	
April 20, 2021	9.50	668.7	0.05	0.0	9.50	699.0	4.09	546.6	9.49	700.9	1.49	5.3	9.50	699.8	0.6	1.0	19.4	-0.20	0.72	0.1	0.0	75.2	0
April 21, 2021	9.50	670.8	0.36	0.0	9.51	700.6	5.05	787.5	9.51	695.3	2.09	10.1	9.50	699.9	0.9	1.8	19.5	-0.20	0.72	0.1	0.0	84.2	
April 22, 2021	9.51	671.1	0.00	0.0	9.50	700.2	3.96	633.1	9.49	696.1	2.37	15.8	9.50	699.9	0.8	1.7	19.8	-0.19	0.73	0.0	0.0	83.7	
April 23, 2021	9.50	669.9	0.00	0.0	9.50	699.7	3.84	632.4	9.50	700.3	2.17	8.0	9.50	700.0	0.8	2.3	19.4	-0.18	0.74	0.1	0.0	89.9	
April 24, 2021	9.50	670.0	0.00	0.0	9.50	699.9	3.90	658.9	9.50	697.6	2.05	6.2	9.50	700.2	1.0	2.5	19.7	-0.18	0.73	0.1	0.0	88.8	
April 25, 2021	9.50	669.9	0.00	0.0	9.50	700.6	3.53	583.5	9.51	698.8	2.17	7.5	9.50	699.9	0.5	1.0	19.4	-0.18	0.72	0.1	0.0	86.8	
April 26, 2021	9.50	667.8	0.00	0.0	9.51	699.7	3.79	646.9	9.50	697.4	2.59	16.1	9.50	699.7	0.2	0.6	19.3	-0.19	0.72	0.1	0.0	81.7	
April 27, 2021	9.50	670.0	0.00	0.0	9.50	699.4	4.61	784.9	9.49	695.2	3.24	21.5	9.50	700.1	0.3	0.8	19.4	-0.19	0.73	0.1	0.7	54.5	
April 28, 2021	9.49	669.8	0.00	0.0	9.50	700.3	4.37	694.2	9.50	703.3	3.21	10.5	9.50	700.3	0.5	2.0	19.4	-0.19	0.73	0.1	1.2	34.4	0
April 29, 2021	9.50	669.6	0.00	0.0	9.50	700.0	3.93	613.5	9.51	702.2	3.13	8.8	9.50	700.3	1.1	1.2	19.3	-0.20	0.73	0.1	1.6	36.1	
April 30, 2021	9.50	669.8	0.00	0.0	9.50	700.2	3.90	611.7	9.50	689.3	3.41	25.7	9.50	699.9	1.4	2.4	19.7	-0.21	0.71	0.1	2.9	75.6	
Avg	9.50	670.2	0.10	0.0	9.50	700.0	4.07	413.4	9.50	699.1	2.55	10.9	9.50	700.1	1.3	5.7	19.5	-0.20	0.70	0.1	0.2	178.8	0
Min	9.49	667.8	0.00	0.0	9.40	697.4	3.14	80.3	9.48	674.6	0.76	0.6	9.49	694.2	0.2	0.4	19.2	-0.21	0.63	0.0	0.0	34.4	0
Max	9.51	674.2	0.36	0.0	9.51	701.6	5.09	787.5	9.52	722.0	4.92	29.9	9.50	706.5	2.8	20.3	19.9	-0.18	0.74	0.1	2.9	513.3	0

Gold Bar Wastewater Treatment Plant
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Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
May 1, 2021	9.50	669.7	0.00	0.0	9.50	699.4	3.88	632.1	9.50	689.0	3.60	21.7	9.50	699.9	1.6	6.6	18.8	-0.21	0.72	0.1	1.9	84.6	
May 2, 2021	9.50	669.9	0.00	0.0	9.50	700.4	3.54	527.6	9.50	702.8	3.07	13.2	9.50	701.0	1.2	4.8	19.2	-0.20	0.72	0.1	0.4	51.6	
May 3, 2021	9.50	669.6	0.00	0.0	9.50	702.5	3.71	850.7	9.51	691.7	3.33	13.4	9.50	699.9	1.3	5.3	19.3	-0.19	0.73	0.1	0.3	48.8	
May 4, 2021	9.50	669.8	0.02	0.0	9.50	700.2	3.69	617.5	9.50	693.8	3.53	23.9	9.50	700.1	1.4	6.8	19.1	-0.20	0.73	0.1	0.4	63.5	
May 5, 2021	9.50	669.7	0.01	0.0	9.50	698.7	3.82	617.9	9.49	674.1	3.91	24.4	9.50	709.8	1.4	8.5	19.3	-0.20	0.73	0.1	0.0	91.9	0
May 6, 2021	9.50	669.8	0.00	0.0	9.50	700.6	4.97	771.9	9.51	687.2	4.44	9.9	9.50	699.8	1.7	7.9	19.6	-0.21	0.72	0.1	0.3	92.0	
May 7, 2021	9.49	668.1	0.05	0.1	9.49	700.3	4.71	732.5	9.50	688.8	4.01	16.0	9.47	687.7	2.4	36.4	18.9	-0.21	0.72	0.1	0.0	62.6	
May 8, 2021	9.51	672.7	0.07	0.0	9.51	701.4	2.80	351.9	9.50	740.5	0.24	8.1	9.51	655.9	1.7	125.3	19.0	-0.20	0.73	0.1	0.0	17.3	
May 9, 2021	9.50	669.5	0.00	0.0	9.50	699.7	1.84	209.0	9.50	690.9	0.13	0.0	9.51	700.9	0.1	0.3	19.2	-0.20	0.72	0.1	0.0	2.3	
May 10, 2021	9.50	669.8	0.00	0.0	9.50	699.6	2.86	282.7	9.57	694.1	1.18	57.4	9.50	699.8	0.5	0.8	19.4	-0.20	0.73	0.1	0.0	8.5	
May 11, 2021	9.49	674.4	0.05	0.0	9.50	699.7	3.76	309.8	9.53	715.8	1.22	1.4	9.49	699.5	1.0	1.1	19.0	-0.20	0.74	0.1	0.0	9.3	
May 12, 2021	9.50	669.6	0.00	0.0	9.50	700.0	2.71	211.2	9.50	695.4	1.22	1.6	9.51	699.2	1.5	1.4	19.2	-0.20	0.73	0.1	0.1	11.4	0
May 13, 2021	9.47	723.2	0.00	0.0	9.49	699.5	3.60	284.7	9.50	696.7	1.62	1.5	9.50	700.4	1.1	0.0	19.4	-0.21	0.73	0.1	0.0	24.0	
May 14, 2021	9.52	676.2	0.07	0.0	9.49	698.9	4.54	301.2	9.50	705.7	1.64	2.1	9.51	700.6	1.3	0.4	18.8	-0.20	0.73	0.1	0.0	11.9	
May 15, 2021	9.49	670.1	0.00	0.0	9.51	700.4	4.81	266.7	9.50	691.1	1.59	1.6	9.50	700.7	1.6	0.5	19.9	-0.21	0.72	0.1	0.2	19.3	
May 16, 2021	9.51	671.2	0.00	0.0	9.50	699.9	4.42	350.2	9.50	702.6	2.20	0.6	9.50	699.8	1.7	1.5	20.2	-0.22	0.71	0.1	0.1	46.1	
May 17, 2021	9.50	670.5	0.00	0.0	9.51	700.3	4.84	343.9	9.50	693.4	2.19	0.2	9.49	700.3	1.8	1.7	19.0	-0.21	0.71	0.1	0.0	24.6	
May 18, 2021	9.51	671.3	0.02	0.0	9.51	701.1	3.41	248.1	9.51	746.7	0.52	0.0	9.51	704.3	0.5	1.0	18.8	-0.19	0.72	0.1	0.0	8.4	
May 19, 2021	9.49	669.7	0.00	0.0	9.51	701.0	1.17	52.3	9.50	701.0	0.00	0.0	9.50	704.0	0.0	1.0	19.5	-0.18	0.73	0.1	0.1	0.7	0
May 20, 2021	9.49	670.2	0.00	0.0	9.50	699.8	0.84	32.9	9.50	699.3	0.00	0.0	9.51	702.7	0.0	1.7	19.6	-0.19	0.74	0.1	0.0	9.2	
May 21, 2021	9.50	669.2	0.00	0.0	9.50	699.7	1.22	53.7	9.50	697.6	0.01	0.0	9.50	701.7	0.0	1.4	19.2	-0.19	0.73	0.1	0.0	0.6	
May 22, 2021	9.50	669.9	0.00	0.0	9.50	699.6	1.38	90.7	9.50	697.3	0.06	0.0	9.50	700.9	0.3	2.5	19.5	-0.21	0.72	0.1	0.0	0.0	
May 23, 2021	9.49	669.9	0.00	0.1	9.50	700.0	1.76	101.3	9.51	698.4	0.19	0.0	9.50	700.8	0.5	1.9	19.2	-0.20	0.72	0.1	0.0	0.4	
May 24, 2021	9.50	669.6	0.00	0.0	9.50	699.6	1.96	141.6	9.50	694.2	0.65	0.0	9.50	701.2	0.7	1.6	18.8	-0.21	0.72	0.1	0.0	1.2	
May 25, 2021	9.50	670.0	0.00	0.2	9.50	699.8	2.22	196.4	9.50	701.8	0.87	0.2	9.50	701.1	0.9	3.2	19.0	-0.21	0.73	0.1	0.0	2.0	0
May 26, 2021	9.50	669.8	0.00	0.2	9.50	700.0	2.43	197.8	9.50	695.1	0.98	0.0	9.50	701.5	1.1	3.6	19.2	-0.21	0.73	0.1	0.0	8.2	
May 27, 2021	9.49	669.5	0.00	0.3	9.49	699.1	3.00	248.0	9.50	696.5	1.30	1.1	9.50	699.5	0.9	1.8	20.0	-0.21	0.71	0.1	0.0	31.9	
May 28, 2021	9.51	670.1	0.00	0.0	9.50	700.1	3.83	282.0	9.50	702.9	0.88	0.0	9.48	698.0	1.4	1.4	18.7	-0.21	0.73	0.1	1.7	15.0	
May 29, 2021	9.49	669.8	0.02	0.5	9.50	700.4	3.26	222.0	9.50	692.2	0.92	0.0	9.52	710.6	1.5	0.4	19.3	-0.22	0.72	0.1	0.1	24.2	
May 30, 2021	9.48	670.9	0.19	0.3	9.50	699.9	3.65	273.1	9.50	694.0	1.48	0.0	9.50	703.4	1.7	1.3	20.4	-0.22	0.70	0.1	0.0	46.8	
May 31, 2021	9.49	670.6	0.01	0.0	9.50	700.1	4.14	310.7	9.50	699.4	1.69	0.0	9.50	700.1	1.4	1.3	20.1	-0.22	0.72	0.1	0.0	48.1	
Avg	9.50	672.1	0.02	0.1	9.50	700.1	3.19	326.2	9.50	699.0	1.57	6.4	9.50	699.5	1.1	7.5	19.3	-0.21	0.72	0.1	0.2	28.0	0
Min	9.47	668.1	0.00	0.0	9.49	698.7	0.84	32.9	9.49	674.1	0.00	0.0	9.47	655.9	0.0	0.0	18.7	-0.22	0.70	0.1	0.0	0.0	0
Max	9.52	723.2	0.19	0.5	9.51	702.5	4.97	850.7	9.57	746.7	4.44	57.4	9.52	710.6	2.4	125.3	20.4	-0.18	0.74	0.1	1.9	92.0	0

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	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
June 1, 2021	9.44	673.0	0.01	0.0	9.47	695.1	4.65	457.9	9.46	693.2	2.32	0.0	9.49	702.4	1.8	0.6	21.6	-0.22	0.71	0.1	0.0	77.4	
June 2, 2021	9.50	669.7	0.05	0.4	9.50	699.6	6.01	573.5	9.50	682.9	3.24	0.4	9.50	699.1	2.6	0.0	22.7	-0.22	0.71	0.1	0.0	102.3	0
June 3, 2021	9.51	670.2	0.03	0.0	9.50	699.6	6.18	534.4	9.50	693.4	3.53	0.9	9.50	699.9	2.7	0.2	23.0	-0.22	0.71	0.1	0.0	115.1	
June 4, 2021	9.50	666.8	0.56	3.3	9.49	699.7	6.76	2944.4	9.50	701.7	2.96	0.6	9.50	701.6	3.6	0.0	20.8	-0.20	0.71	0.1	2.6	570.3	
June 5, 2021	9.52	672.5	0.03	0.1	9.50	699.6	7.24	7610.8	9.50	700.6	5.53	7.6	9.50	700.0	4.4	6.1	18.3	-0.22	0.73	0.1	0.0	1394.5	
June 6, 2021	9.51	669.3	0.04	0.3	9.50	700.1	7.25	7374.5	9.50	678.0	7.52	1.0	9.50	701.7	7.4	0.0	19.1	-0.21	0.71	0.1	0.0	1399.7	
June 7, 2021	9.47	665.5	0.36	0.0	9.50	700.0	7.22	6535.7	9.50	689.6	9.00	0.8	9.49	698.5	8.7	7.6	17.0	-0.20	0.73	0.1	0.0	1464.2	
June 8, 2021	9.51	673.9	0.38	0.2	9.50	700.2	6.78	6089.3	9.50	695.8	7.93	0.7	9.49	698.1	12.0	219.9	13.9	-0.20	0.74	0.1	0.0	1328.3	
June 9, 2021	9.50	671.0	0.28	0.5	9.50	700.4	5.94	5557.7	9.50	690.2	6.10	0.2	9.49	697.2	12.5	383.2	14.8	-0.21	0.74	0.1	0.0	1311.4	0
June 10, 2021	9.52	672.2	0.13	0.6	9.50	699.7	6.61	3381.6	9.50	697.5	4.11	9.3	9.50	703.9	9.2	32.2	14.4	-0.20	0.75	0.1	0.0	677.2	
June 11, 2021	9.49	668.4	0.00	1.5	9.52	701.6	3.12	175.8	9.51	706.1	3.19	0.0	9.53	701.0	2.9	57.2	15.9	-0.21	0.72	0.1	0.0	651.5	
June 12, 2021	9.50	669.6	0.04	1.3	9.50	699.4	3.92	314.5	9.50	697.2	5.22	0.1	9.50	700.9	6.4	150.4	16.4	-0.21	0.71	0.1	0.0	1220.3	
June 13, 2021	9.47	669.7	0.14	1.0	9.50	701.1	4.28	345.5	9.51	674.0	7.06	1.1	9.50	696.4	8.1	281.3	21.5	-0.22	0.70	0.1	0.0	1479.3	
June 14, 2021	9.50	666.8	0.48	0.7	9.47	697.8	4.98	413.1	9.50	718.2	4.42	0.4	9.50	700.4	7.0	177.9	21.2	-0.22	0.71	0.1	0.0	968.0	
June 15, 2021	9.51	669.9	0.47	0.2	9.49	699.6	5.56	178.9	9.50	681.5	5.53	0.9	9.50	698.4	6.8	143.4	20.3	-0.22	0.72	0.1	0.0	1430.7	
June 16, 2021	9.51	673.7	0.14	0.5	9.50	700.7	5.50	280.2	9.52	698.4	8.48	1.4	9.50	700.8	8.6	34.8	19.7	-0.21	0.70	0.1	0.0	1559.8	0
June 17, 2021	9.50	669.2	0.11	0.1	9.64	698.7	5.67	214.4	9.50	692.2	8.64	1.2	9.50	699.5	9.2	65.3	18.5	-0.21	0.72	0.1	0.0	1693.9	
June 18, 2021	9.49	668.7	0.15	1.2	10.00	699.8	5.74	10.1	9.50	681.4	10.36	1.0	9.50	700.9	10.2	148.4	19.3	-0.21	0.72	0.1	0.0	1526.9	
June 19, 2021	9.51	671.0	0.24	1.5	10.00	699.9	6.00	14.1	9.50	687.1	9.21	0.4	9.50	700.6	9.2	37.6	19.2	-0.21	0.72	0.1	0.0	1456.2	
June 20, 2021	9.51	670.9	0.16	0.8	9.99	699.8	6.33	18.6	9.50	662.2	13.37	1.9	9.50	701.9	12.5	238.0	19.3	-0.22	0.72	0.0	0.5	1670.4	
June 21, 2021	9.44	668.0	0.41	1.2	10.00	694.3	7.07	44.0	9.50	677.9	11.99	3.3	9.78	700.5	9.5	42.1	21.6	-0.22	0.70	0.1	0.0	920.8	
June 22, 2021	9.51	670.4	0.63	0.0	10.01	701.0	6.58	10.6	9.50	668.8	12.67	10.8	10.01	700.3	8.7	102.2	22.6	-0.22	0.71	0.1	0.0	339.2	
June 23, 2021	9.49	669.8	0.54	0.0	10.00	700.0	6.73	2.6	9.49	668.9	13.14	6.0	10.00	700.9	9.2	58.8	20.6	-0.22	0.71	0.1	0.0	339.3	0
June 24, 2021	9.51	668.8	0.49	0.3	10.00	699.9	7.18	2.5	9.53	674.8	11.16	2.2	10.00	700.5	9.2	#N/A	21.2	-0.22	0.72	0.1	0.2	546.1	
June 25, 2021	9.49	670.2	0.57	0.1	10.00	699.8	7.48	0.5	9.50	678.6	10.95	3.3	10.00	700.4	8.6	#N/A	23.2	-0.21	0.71	0.1	0.1	#N/A	
June 26, 2021	9.51	669.9	0.57	0.3	10.01	700.2	7.52	0.0	9.50	675.1	11.29	5.9	10.00	698.9	10.6	#N/A	25.0	-0.22	0.71	0.1	0.0	#N/A	
June 27, 2021	9.48	667.4	0.60	0.2	9.99	696.2	6.72	0.0	9.50	667.9	10.46	5.7	9.99	703.2	9.6	#N/A	25.5	-0.22	0.69	0.1	0.0	#N/A	
June 28, 2021	9.48	669.6	0.60	0.0	9.99	699.9	7.27	0.0	9.57	632.8	10.61	7.2	10.40	707.0	8.7	#N/A	27.2	-0.22	0.69	0.1	0.0	#N/A	
June 29, 2021	9.51	661.4	0.75	0.0	10.00	680.8	8.40	24.2	9.50	663.8	11.13	6.6	10.04	699.7	10.2	1055.6	28.9	-0.22	0.68	0.0	0.0	594.8	
June 30, 2021	9.50	652.1	0.72	0.0	10.01	652.8	8.16	61.2	9.50	654.4	13.80	16.0	10.00	699.8	9.7	621.0	30.5	-0.23	0.69	0.1	0.0	739.6	0
Avg	9.50	669.0	0.32	0.5	9.72	697.2	6.29	1439.0	9.50	682.8	8.16	3.2	9.67	700.5	8.0	154.6	20.8	-0.21	0.71	0.1	0.1	983.8	0
Min	9.44	652.1	0.00	0.0	9.47	652.8	3.12	0.0	9.46	632.8	2.32	0.0	9.49	696.4	1.8	0.0	13.9	-0.23	0.68	0.0	0.0	77.4	0
Max	9.52	673.9	0.75	3.3	10.01	701.6	8.40	7610.8	9.57	718.2	13.80	16.0	10.40	707.0	12.5	1055.6	30.5	-0.20	0.75	0.1	2.6	1693.9	0

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
July 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
July 1, 2021	9.44	670.4	0.72	0.0	9.99	669.1	7.99	34.9	9.50	668.6	12.72	12.8	10.00	700.4	10.5	717.7	29.9	-0.22	0.69	0.1	0.0	580.2	
July 2, 2021	9.50	669.5	0.73	0.1	10.00	670.4	8.53	10.9	9.48	662.0	15.19	13.0	10.00	699.2	10.7	595.2	27.3	-0.21	0.70	0.1	0.0	845.8	
July 3, 2021	9.50	670.4	0.73	0.0	9.99	669.1	8.53	12.0	9.50	671.3	17.00	7.8	10.01	700.9	13.4	1172.9	25.1	-0.21	0.71	0.1	0.0	923.5	
July 4, 2021	9.50	670.1	0.67	0.6	9.89	670.2	8.51	65.8	9.51	694.1	13.52	2.5	10.00	700.0	10.1	771.7	21.0	-0.21	0.73	0.1	0.0	620.4	
July 5, 2021	9.51	670.3	0.54	0.9	10.00	669.7	8.69	15.1	9.49	683.1	16.88	3.7	10.00	699.9	9.7	685.1	19.3	-0.34	0.70	0.1	0.0	432.5	
July 6, 2021	9.63	659.0	0.80	1.0	9.91	660.1	9.05	76.1	9.67	580.5	20.11	16.5	9.90	672.3	10.6	1195.4	18.1	-0.32	0.72	0.1	0.0	808.4	
July 7, 2021	9.78	648.5	0.81	2.4	9.80	650.0	8.51	183.3	9.80	634.9	15.19	0.7	9.80	664.3	10.3	1262.3	22.0	-0.21	0.71	0.1	0.0	635.6	0
July 8, 2021	9.79	648.6	0.98	1.1	9.81	650.0	8.43	172.1	9.80	642.6	13.64	0.9	9.80	680.4	9.1	911.7	23.5	-0.21	0.71	0.1	0.0	616.0	
July 9, 2021	9.73	659.2	2.06	0.8	9.83	650.6	7.77	216.8	9.81	617.3	11.21	6.1	9.90	647.8	9.3	920.9	24.7	-0.23	0.70	0.1	0.0	641.4	
July 10, 2021	9.89	656.6	1.17	0.3	9.80	650.2	8.14	203.3	9.80	614.4	12.83	5.1	9.80	649.8	9.3	997.6	24.8	-0.23	0.71	0.1	0.0	548.7	
July 11, 2021	9.81	647.3	0.93	0.0	9.80	649.0	8.92	348.1	9.80	618.3	11.03	2.6	9.80	650.0	11.5	1408.2	22.7	-0.21	0.71	0.1	0.0	524.7	
July 12, 2021	9.79	652.6	1.17	0.5	9.80	650.0	8.83	294.2	9.80	608.9	14.66	3.0	9.80	649.8	10.5	1235.2	22.6	-0.21	0.71	0.1	0.0	750.6	
July 13, 2021	9.83	650.0	0.48	0.6	9.80	650.2	9.10	273.3	9.80	625.4	17.22	2.9	9.80	650.4	14.0	1868.6	22.9	-0.21	0.72	0.1	0.0	1048.1	
July 14, 2021	9.76	647.2	0.71	0.3	9.80	649.9	9.32	287.8	9.82	620.8	20.23	10.5	9.75	650.7	10.9	1087.7	24.7	-0.22	0.70	0.1	0.0	449.3	0
July 15, 2021	9.82	650.0	0.58	0.0	9.80	649.7	9.88	311.4	9.80	631.0	22.30	18.4	9.80	649.9	10.8	463.3	24.9	-0.21	0.70	0.1	0.0	302.5	
July 16, 2021	9.82	649.9	0.48	0.0	9.80	650.3	9.64	251.8	9.80	624.9	26.32	17.1	9.80	648.6	14.8	954.7	22.0	-0.20	0.71	0.1	0.0	547.2	
July 17, 2021	9.77	649.9	0.68	0.4	9.80	649.9	9.06	268.6	9.80	604.2	23.52	13.9	9.80	650.2	11.6	724.8	18.2	-0.20	0.73	0.1	0.0	903.9	
July 18, 2021	9.82	649.9	0.46	0.1	9.80	650.1	9.07	277.4	9.80	620.2	18.39	8.0	9.80	650.7	10.0	560.1	18.4	-0.19	0.74	0.1	0.0	682.5	
July 19, 2021	9.80	649.7	0.47	1.5	9.80	649.1	8.79	227.8	9.80	604.3	18.54	3.2	9.80	649.2	10.8	632.8	19.3	-0.19	0.74	0.1	0.0	857.1	
July 20, 2021	9.81	621.5	0.51	2.5	9.76	605.9	8.50	310.3	9.80	570.5	22.09	4.8	9.80	621.5	10.8	719.2	18.6	-0.20	0.74	0.1	0.0	1177.2	
July 21, 2021	9.73	594.3	0.57	2.5	9.77	575.2	7.40	345.9	9.81	554.9	21.48	18.8	9.78	579.7	13.7	973.1	19.2	-0.19	0.73	0.1	0.0	853.8	0
July 22, 2021	9.82	607.8	0.22	0.5	9.80	611.7	4.72	269.8	9.80	629.5	3.28	4.2	9.82	619.3	7.9	539.9	18.6	-0.19	0.73	0.1	0.0	89.3	
July 23, 2021	9.79	599.7	0.35	2.5	9.80	600.3	3.18	126.2	9.80	574.6	8.47	2.5	9.79	631.2	5.8	321.2	20.7	-0.20	0.71	0.1	0.0	386.8	
July 24, 2021	9.80	599.9	0.45	1.3	9.80	615.5	4.59	312.5	9.80	558.3	11.19	4.2	9.80	592.5	9.9	833.1	20.7	-0.19	0.72	0.1	0.0	605.0	
July 25, 2021	9.80	600.8	0.24	0.7	9.80	600.6	5.43	423.0	9.80	627.9	10.21	3.6	9.80	594.6	9.5	727.8	20.4	-0.20	0.72	0.1	0.0	400.0	
July 26, 2021	9.80	599.9	0.26	2.2	9.78	603.1	6.19	275.4	9.80	625.4	9.95	3.3	9.79	597.0	7.7	516.8	20.7	-0.20	0.72	0.1	0.0	351.8	
July 27, 2021	9.80	599.6	0.31	1.2	9.81	602.7	5.96	219.1	9.80	584.2	13.07	13.9	9.80	591.9	10.6	771.1	20.8	-0.21	0.72	0.1	0.0	472.3	
July 28, 2021	9.78	600.1	0.36	1.4	9.80	606.0	5.44	192.2	9.80	596.6	13.12	17.8	9.80	596.9	9.7	659.4	21.8	-0.20	0.71	0.1	0.0	587.2	0
July 29, 2021	9.81	599.9	0.27	1.1	9.80	601.2	5.78	170.5	9.80	575.4	13.05	44.0	9.80	599.9	8.2	479.5	22.7	-0.21	0.71	0.1	0.0	420.9	
July 30, 2021	9.80	599.9	0.33	1.1	9.79	598.3	6.28	199.1	9.80	574.7	12.21	50.8	9.80	599.8	7.9	398.2	23.2	-0.21	0.72	0.1	0.0	495.4	
July 31, 2021	9.80	599.4	0.38	1.0	9.81	601.1	6.12	187.4	9.81	601.2	11.58	34.2	9.80	599.8	10.6	617.5	24.0	-0.21	0.71	0.1	0.0	602.9	
Avg	9.74	635.2	0.63	0.9	9.83	634.8	7.62	211.7	9.75	616.1	15.17	11.3	9.84	641.6	10.3	829.8	22.0	-0.21	0.72	0.1	0.0	618.1	0
Min	9.44	594.3	0.22	0.0	9.76	575.2	3.18	10.9	9.48	554.9	3.28	0.7	9.75	579.7	5.8	321.2	18.1	-0.34	0.69	0.1	0.0	89.3	0
Max	9.89	670.4	2.06	2.5	10.00	670.4	9.88	423.0	9.82	694.1	26.32	50.8	10.01	700.9	14.8	1868.6	29.9	-0.19	0.74	0.1	0.0	1177.2	0

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
August 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
August 1, 2021	9.78	600.2	0.43	0.8	9.80	599.8	6.14	170.5	9.80	596.7	10.00	24.5	9.80	597.3	11.1	670.5	23.9	-0.21	0.71	0.1	0.0	398.2	
August 2, 2021	9.81	600.2	0.25	1.4	9.80	598.8	6.70	203.7	9.80	624.3	8.85	14.2	9.80	597.1	9.8	586.2	21.2	-0.20	0.73	0.1	0.0	308.2	
August 3, 2021	9.79	591.0	0.62	2.1	9.81	602.5	7.30	266.3	10.08	565.0	9.68	122.1	9.84	601.3	8.6	458.1	22.6	-0.19	0.62	0.1	0.0	212.1	
August 4, 2021	9.81	606.8	1.44	1.8	9.79	599.1	6.28	262.7	10.29	541.2	15.03	429.2	9.84	594.3	10.0	598.3	22.9	-0.16	0.56	0.1	0.0	457.3	0
August 5, 2021	9.80	601.7	0.64	1.3	9.79	599.8	6.44	236.3	9.80	526.4	16.90	89.1	9.80	598.2	10.1	597.7	23.5	-0.21	0.70	0.1	0.0	459.8	
August 6, 2021	9.82	599.8	0.55	0.6	9.81	600.2	6.87	225.6	9.80	564.2	15.23	50.9	9.80	599.9	9.5	521.8	21.2	-0.20	0.71	0.1	0.0	389.1	
August 7, 2021	9.80	599.9	0.65	1.2	9.80	600.1	6.57	226.3	9.80	610.7	7.72	21.7	9.80	585.4	12.3	938.7	18.9	-0.20	0.72	0.1	0.0	309.7	
August 8, 2021	9.82	598.0	0.20	1.7	9.80	603.2	5.34	227.9	9.79	618.7	13.95	6.4	9.80	600.7	7.3	455.7	18.8	-0.19	0.72	0.1	0.0	215.9	
August 9, 2021	9.80	614.3	0.36	3.0	9.80	628.3	5.30	506.0	10.26	549.1	12.70	134.3	9.72	666.5	27.1	7582.6	21.5	-0.19	0.71	0.1	0.0	504.3	
August 10, 2021	9.63	644.6	0.34	1.2	9.78	696.9	5.33	202.4	9.16	655.9	11.57	221.9	9.81	700.0	9.4	140.1	21.1	-0.20	0.71	0.1	0.0	324.3	
August 11, 2021	9.80	649.7	0.34	1.0	9.79	699.3	6.07	155.0	9.79	654.4	12.54	8.5	9.80	699.5	9.6	193.8	21.0	-0.21	0.71	0.1	0.0	328.1	
August 12, 2021	9.79	649.6	0.45	2.2	9.80	699.7	7.42	118.1	9.80	678.6	15.18	2.4	9.86	692.6	8.2	109.8	20.6	-0.20	0.71	0.1	0.0	539.0	0
August 13, 2021	9.67	636.8	0.43	2.1	9.74	694.7	7.13	65.2	9.83	648.7	17.54	40.0	9.80	702.3	13.6	350.1	22.7	-0.21	0.71	0.1	0.0	671.3	
August 14, 2021	9.81	649.8	0.46	1.0	9.82	700.8	6.22	14.5	9.81	645.5	13.28	5.0	9.80	703.8	10.7	184.2	23.9	-0.21	0.71	0.1	0.0	332.0	
August 15, 2021	9.72	650.4	0.48	1.1	9.78	699.1	6.96	12.2	9.80	644.7	16.58	9.5	9.79	701.3	12.5	209.8	23.0	-0.20	0.71	0.0	0.6	422.2	
August 16, 2021	9.90	649.4	0.42	0.8	9.80	699.9	7.71	2.5	9.80	644.1	18.18	7.9	9.81	661.6	9.7	126.6	20.4	-0.19	0.71	0.1	1.9	108.7	
August 17, 2021	9.80	650.0	0.39	1.5	9.79	698.7	8.91	5.6	9.80	641.3	22.89	11.2	9.80	649.5	12.8	315.2	18.9	-0.20	0.73	0.1	1.7	50.7	
August 18, 2021	9.80	649.9	0.34	2.2	9.81	700.8	8.62	2.9	9.80	644.5	20.15	8.8	9.80	649.8	11.8	244.5	20.5	-0.20	0.71	0.1	1.7	213.6	0
August 19, 2021	9.80	650.0	0.43	1.5	9.79	699.5	8.73	7.0	9.80	643.2	23.97	8.8	9.80	649.0	14.6	431.9	19.6	-0.29	0.88	0.1	3.2	151.7	
August 20, 2021	9.80	650.5	0.37	2.0	9.79	700.9	9.01	6.4	9.80	644.1	17.86	4.4	9.80	649.7	11.5	284.1	18.7	-0.33	1.08	0.1	3.4	28.0	
August 21, 2021	9.81	650.0	0.38	2.2	9.81	700.0	9.10	36.9	9.80	644.0	18.81	11.4	9.80	649.0	13.6	371.4	19.7	-0.32	1.07	0.1	4.5	165.0	
August 22, 2021	9.77	647.4	0.44	1.8	9.79	698.4	9.94	56.1	9.80	644.2	16.43	13.5	9.80	648.6	12.0	364.3	18.9	-0.32	1.07	0.1	6.6	58.1	
August 23, 2021	9.81	665.9	0.35	0.7	9.82	685.0	8.94	76.7	9.80	656.2	6.78	12.5	9.81	645.5	7.4	275.0	19.8	-0.32	1.07	0.1	6.6	14.3	
August 24, 2021	9.86	668.2	0.01	2.8	9.83	670.2	7.24	139.9	9.80	664.5	8.05	0.9	9.79	671.7	4.1	29.4	18.1	-0.37	1.06	0.1	5.4	52.5	
August 25, 2021	9.81	669.4	0.15	5.4	9.80	669.7	7.80	204.9	9.80	664.5	13.41	2.4	9.80	669.3	8.7	118.8	20.3	-0.33	1.07	0.1	6.2	103.3	0
August 26, 2021	9.73	670.5	0.11	6.6	9.80	669.4	8.31	300.7	9.80	664.1	13.45	1.4	9.80	669.8	8.3	78.0	20.1	-0.33	1.07	0.1	8.2	101.4	
August 27, 2021	9.80	669.5	0.21	5.1	9.80	701.2	8.57	269.2	9.80	662.3	17.80	2.1	9.80	669.2	10.5	136.0	19.3	-0.32	1.07	0.1	8.1	210.4	
August 28, 2021	9.80	669.9	0.20	2.9	9.66	668.7	8.93	994.9	9.80	666.1	13.30	1.1	9.80	669.8	10.7	164.6	19.8	-0.33	1.07	0.1	5.9	62.8	
August 29, 2021	9.80	669.9	0.26	2.8	9.78	670.7	9.38	892.3	9.80	667.1	11.23	1.4	9.79	669.9	7.7	73.1	20.6	-0.33	1.07	0.1	6.1	46.5	
August 30, 2021	9.80	670.1	0.21	2.8	9.80	670.4	9.07	1021.4	9.81	666.0	12.81	0.3	9.80	669.9	8.9	68.9	19.5	-0.32	1.07	0.1	5.5	7.6	
August 31, 2021	9.80	670.7	0.22	0.6	9.79	667.6	8.93	1367.8	9.80	663.9	18.47	13.9	9.81	669.7	9.3	85.9	18.8	-0.32	1.07	0.1	3.4	241.3	0
Avg	9.79	640.8	0.39	2.1	9.79	664.3	7.59	267.0	9.82	632.4	14.53	41.3	9.80	651.7	10.7	540.8	20.6	-0.25	0.85	0.1	2.5	241.5	0
Min	9.63	591.0	0.01	0.6	9.66	598.8	5.30	2.5	9.16	526.4	6.78	0.3	9.72	585.4	4.1	29.4	18.1	-0.37	0.56	0.0	0.0	7.6	0
Max	9.90	670.7	1.44	6.6	9.83	701.2	9.94	1367.8	10.29	678.6	23.97	429.2	9.86	703.8	27.1	7582.6	23.9	-0.16	1.08	0.1	8.2	671.3	0

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Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
September 1, 2021	9.77	667.4	0.27	1.2	9.79	670.8	8.25	1226.6	9.82	665.1	14.71	9.2	9.80	669.3	9.0	88.4	19.6	-0.31	1.07	0.1	2.4	125.9	
September 2, 2021	9.80	672.5	0.05	2.6	9.79	669.6	7.24	1106.8	9.79	665.8	17.32	2.7	9.80	670.5	5.9	51.0	19.6	-0.32	1.07	0.1	1.9	187.0	
September 3, 2021	9.78	670.3	0.18	4.0	9.79	670.4	7.73	1255.3	9.80	664.1	21.41	10.6	9.80	669.9	7.4	58.3	19.7	-0.32	1.06	0.1	2.9	119.7	
September 4, 2021	9.80	669.7	0.19	6.7	9.80	670.1	7.53	1368.7	9.81	663.0	21.96	5.9	9.80	669.1	12.4	208.6	20.4	-0.32	1.06	0.1	1.8	76.8	
September 5, 2021	9.79	670.5	0.20	8.3	9.79	669.8	8.07	1538.6	9.80	664.5	20.04	5.9	9.80	669.2	12.8	211.0	20.2	-0.33	1.05	0.1	3.3	92.5	
September 6, 2021	9.81	670.1	0.16	5.3	9.80	670.1	7.69	1514.6	9.80	664.8	20.18	12.9	9.80	669.2	13.9	269.9	19.5	-0.33	1.06	0.1	1.3	55.8	
September 7, 2021	9.79	669.9	0.23	3.2	9.80	669.7	8.63	1796.4	9.80	660.9	23.44	7.8	9.79	668.7	11.6	219.3	19.4	-0.36	1.05	0.1	1.1	56.9	
September 8, 2021	9.80	669.9	0.59	10.7	9.79	668.1	6.86	1353.0	9.80	662.8	27.30	9.4	9.80	669.1	12.7	249.3	20.2	-0.34	1.04	0.1	0.2	115.5	0
September 9, 2021	9.81	670.4	0.47	7.0	9.93	660.3	8.33	2367.5	9.81	661.7	19.32	15.0	9.83	674.7	11.6	304.2	19.7	-0.36	1.05	0.1	0.1	87.7	
September 10, 2021	9.78	669.9	0.35	6.2	9.80	669.9	7.81	1516.8	9.80	664.1	7.69	1.3	9.72	650.8	5.1	504.5	19.5	-0.36	1.05	0.1	0.1	41.9	
September 11, 2021	9.81	670.1	0.32	9.2	9.80	670.2	7.35	1374.6	9.80	663.0	7.01	0.4	9.81	670.0	3.6	149.7	19.3	-0.36	1.06	0.1	0.3	33.3	
September 12, 2021	9.79	671.3	0.38	3.0	9.80	670.4	8.17	1525.4	9.80	654.5	6.31	3.5	9.71	644.8	7.0	568.5	20.0	-0.35	1.06	0.1	1.2	38.1	
September 13, 2021	9.81	669.1	0.40	4.5	9.80	669.5	6.69	1226.1	9.80	661.6	9.08	3.7	9.98	686.7	3.3	232.0	19.9	-0.36	1.05	0.1	0.2	114.9	
September 14, 2021	9.80	670.1	0.33	6.6	9.80	669.9	7.53	1380.6	9.80	664.3	8.02	1.6	9.67	647.9	4.8	265.7	20.0	-0.36	1.05	0.1	6.7	116.3	
September 15, 2021	9.80	670.1	0.30	6.2	9.81	670.9	6.03	1093.6	9.82	659.0	8.16	2.1	9.92	667.3	4.2	86.9	20.1	-0.34	1.04	0.1	0.3	0.0	0
September 16, 2021	9.81	671.8	0.27	2.0	9.79	669.6	6.12	1149.0	9.80	665.2	7.76	2.1	9.80	669.6	5.6	549.9	20.6	-0.35	1.05	0.1	0.0	0.0	
September 17, 2021	9.80	669.9	0.30	4.2	9.80	670.9	7.24	1489.4	9.82	662.8	9.03	4.8	9.80	669.5	5.4	492.9	20.6	-0.33	1.04	0.1	0.0	0.0	
September 18, 2021	9.79	669.9	0.37	6.6	9.80	670.0	6.86	1447.7	9.80	664.7	11.04	4.1	9.80	668.6	7.3	653.4	20.3	-0.34	1.04	0.1	0.0	0.0	
September 19, 2021	9.81	670.4	0.22	6.0	9.80	669.8	6.64	1328.9	9.79	665.3	7.88	3.1	9.80	660.3	5.6	442.7	20.4	-0.34	1.05	0.1	0.5	0.0	
September 20, 2021	9.74	691.6	0.31	6.1	9.81	670.4	6.48	1312.8	9.81	664.2	8.23	4.3	9.80	683.1	4.7	335.6	20.6	-0.35	1.05	0.1	0.0	0.0	
September 21, 2021	9.79	670.4	0.30	6.6	9.80	669.9	6.62	1430.4	9.80	665.1	7.17	5.3	9.79	670.0	3.5	196.2	20.6	-0.36	1.05	0.1	0.0	0.0	
September 22, 2021	9.70	667.8	0.42	1.5	9.77	670.1	6.90	1519.6	9.80	662.7	7.83	1.1	9.77	664.2	6.0	556.5	20.1	-0.36	1.04	0.1	0.0	15.8	0
September 23, 2021	9.82	672.2	0.45	0.0	9.80	669.8	6.25	1293.8	9.81	664.7	6.83	0.0	9.84	685.4	4.1	1787.2	20.8	-0.36	1.04	0.0	0.0	139.8	
September 24, 2021	9.80	670.3	0.38	0.0	9.80	670.0	6.87	1418.5	9.79	664.9	7.89	0.0	9.78	677.3	4.5	2183.2	20.9	-0.35	1.05	0.1	0.0	320.9	
September 25, 2021	9.80	670.0	0.41	0.0	9.80	670.3	6.78	1373.6	9.80	664.8	9.43	0.0	9.76	668.3	6.1	914.1	19.9	-0.36	1.04	0.1	0.0	91.6	
September 26, 2021	9.79	670.1	0.33	0.0	9.80	669.8	6.41	1352.8	9.80	664.2	8.21	0.0	9.81	634.3	4.9	762.1	19.9	-0.36	1.03	0.1	0.0	48.9	
September 27, 2021	9.80	669.3	0.40	0.0	9.81	670.3	5.92	1174.1	9.82	662.7	8.14	4.5	9.80	666.1	4.7	378.6	20.3	-0.35	1.03	0.1	0.0	55.5	
September 28, 2021	9.75	662.9	1.87	0.0	9.80	670.0	5.85	1161.3	9.85	665.1	6.80	0.0	9.80	669.7	5.5	467.3	20.1	-0.35	1.03	0.1	0.0	68.5	
September 29, 2021	9.82	672.5	1.25	0.0	9.80	670.0	5.68	1151.8	9.81	665.7	5.05	0.0	9.80	669.4	6.4	643.1	20.5	-0.35	1.04	0.1	0.0	198.9	0
September 30, 2021	9.79	666.9	1.73	0.0	9.80	670.1	5.42	1107.5	9.79	479.5	6.82	451.6	9.78	654.7	12.2	1531.8	20.2	-0.35	1.04	0.1	0.0	131.5	
Avg	9.79	670.6	0.45	3.9	9.80	669.7	7.00	1378.5	9.80	657.4	11.67	19.1	9.80	666.9	7.1	512.1	20.1	-0.35	1.05	0.1	0.8	77.8	0
Min	9.70	662.9	0.05	0.0	9.77	660.3	5.42	1093.6	9.79	479.5	5.05	0.0	9.67	634.3	3.3	51.0	19.3	-0.36	1.03	0.0	0.0	0.0	0
Max	9.82	691.6	1.87	10.7	9.93	670.9	8.63	2367.5	9.85	665.8	27.30	451.6	9.98	686.7	13.9	2183.2	20.9	-0.31	1.07	0.1	6.7	320.9	0

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Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
October 1, 2021	9.79	668.1	2.35	0.0	9.80	670.0	5.02	997.0	9.80	582.8	4.79	32.8	9.81	556.1	11.2	1465.0	20.3	-0.36	1.04	0.1	0.0	30.4	
October 2, 2021	9.80	667.9	2.23	0.0	9.80	669.7	5.23	1115.5	9.84	581.9	5.69	171.7	9.80	667.9	14.0	1804.2	20.7	-0.35	1.04	0.1	0.0	10.3	
October 3, 2021	9.77	681.2	1.88	0.0	9.78	676.1	5.91	906.0	9.79	638.0	6.86	44.2	9.82	668.6	12.7	1695.9	21.1	-0.35	1.03	0.1	0.0	177.9	
October 4, 2021	9.87	656.0	0.65	0.0	9.81	611.2	6.08	945.3	9.81	632.6	4.13	4.4	9.80	670.9	8.5	1015.2	21.0	-0.34	1.04	0.1	0.0	83.9	
October 5, 2021	9.71	562.2	2.63	243.3	9.78	604.7	5.88	800.6	9.81	666.1	3.11	0.0	9.79	525.8	10.3	1729.4	21.1	-0.34	1.04	0.1	0.0	55.1	
October 6, 2021	9.71	657.8	3.00	0.0	9.83	670.0	5.97	909.5	9.80	554.7	3.45	47.0	9.81	569.6	10.4	1557.5	21.2	-0.34	1.04	0.1	0.0	227.5	
October 7, 2021	9.86	678.6	1.38	0.0	9.80	536.2	6.99	480.9	9.80	655.4	4.18	0.0	9.81	654.9	8.4	1089.1	21.4	-0.33	1.04	0.1	0.0	444.3	
October 8, 2021	9.83	670.6	0.44	0.0	9.80	670.7	6.58	0.0	9.80	668.1	3.96	0.0	9.81	660.4	8.5	1427.4	21.8	-0.33	1.03	0.1	0.0	543.8	4.44
October 9, 2021	9.75	659.0	1.33	0.0	9.80	669.7	5.78	0.0	9.80	667.1	5.13	0.0	9.79	639.6	10.3	1734.8	21.4	-0.33	1.03	0.1	0.0	493.1	
October 10, 2021	9.80	671.3	1.99	0.0	9.80	669.7	6.29	0.0	9.80	667.1	4.84	0.0	9.80	581.6	11.0	1713.2	21.1	-0.33	1.04	0.1	0.0	229.6	
October 11, 2021	9.79	667.8	1.99	0.0	9.79	669.5	6.38	0.0	9.80	667.6	4.15	0.0	9.78	630.2	9.6	1323.5	21.8	-0.33	1.04	0.1	0.0	771.9	
October 12, 2021	9.85	681.8	0.84	0.0	9.80	670.3	6.27	0.0	9.80	668.5	3.65	0.0	9.86	647.6	8.7	1475.3	21.9	-0.32	1.03	0.1	0.0	426.5	
October 13, 2021	9.81	669.7	0.42	0.0	9.80	669.6	6.07	0.0	9.80	668.3	4.00	0.0	9.79	669.3	8.7	2047.7	21.9	-0.32	1.03	0.1	0.0	575.7	
October 14, 2021	9.79	670.1	0.42	0.0	9.80	669.9	6.31	0.0	9.79	667.5	4.45	0.0	9.79	669.6	7.6	1454.8	22.0	-0.32	1.04	0.1	0.0	398.8	
October 15, 2021	9.80	669.9	0.37	0.0	9.80	669.9	6.55	0.0	9.80	667.1	6.33	0.0	9.80	669.1	9.0	1750.5	21.7	-0.33	1.03	0.1	0.0	276.9	105.23
October 16, 2021	9.79	669.9	0.34	0.0	9.80	670.0	6.46	0.0	10.02	649.3	6.93	32.0	9.80	669.0	10.2	1907.0	21.2	-0.34	1.03	0.1	0.0	315.9	
October 17, 2021	9.79	669.3	0.42	0.0	9.80	669.8	7.03	0.0	9.80	664.8	6.80	0.0	10.11	682.9	10.1	5566.1	21.2	-0.33	1.03	0.1	0.0	107.1	
October 18, 2021	9.82	671.4	0.16	0.0	9.80	670.2	6.83	0.0	9.86	661.5	4.97	0.0	10.06	702.7	8.9	4806.1	21.6	-0.32	1.03	0.1	0.0	498.8	
October 19, 2021	9.79	671.8	0.08	0.0	9.74	670.8	5.56	0.0	9.79	656.4	4.09	0.0	9.82	684.3	6.2	877.5	21.4	-0.33	1.04	0.1	0.0	394.9	84.91
October 20, 2021	9.80	670.2	0.02	0.0	9.80	670.0	7.10	0.0	9.80	660.4	4.26	0.0	9.80	682.0	3.9	526.6	21.3	-0.34	1.03	0.1	0.0	318.8	
October 21, 2021	9.80	670.1	0.05	0.0	9.80	670.2	7.11	0.0	9.81	669.6	5.72	0.0	9.80	680.5	5.7	786.9	21.7	-0.33	1.04	0.1	0.0	416.3	
October 22, 2021	9.80	669.9	0.08	0.0	9.81	670.5	5.59	0.0	9.80	664.4	6.02	0.0	9.80	679.8	5.9	720.0	21.6	-0.32	1.03	0.1	0.0	344.4	
October 23, 2021	9.79	671.2	0.20	0.0	9.79	669.8	5.38	0.0	9.81	665.5	4.71	0.0	9.79	680.1	4.7	502.1	21.6	-0.32	0.98	0.1	0.0	82.3	
October 24, 2021	9.81	669.0	0.09	0.0	9.81	670.2	4.92	0.0	9.82	668.3	1.31	0.0	9.83	680.8	0.9	51.8	21.5	-0.32	1.08	0.1	0.0	43.1	
October 25, 2021	9.81	670.4	0.09	0.0	9.79	669.4	4.90	0.0	9.80	669.3	2.50	0.0	9.79	679.9	2.9	268.0	21.3	-0.32	1.02	0.1	0.0	108.3	
October 26, 2021	9.68	698.4	0.06	0.0	9.87	699.4	5.28	0.0	9.80	668.6	2.96	0.0	9.80	680.0	4.3	484.5	21.7	-0.32	1.02	0.1	0.0	247.3	
October 27, 2021	9.84	674.2	0.02	0.0	9.82	667.4	5.83	0.0	9.80	668.0	3.38	0.0	9.80	680.3	4.5	481.5	21.6	-0.32	1.03	0.1	0.0	124.2	
October 28, 2021	9.80	670.0	0.00	0.0	9.80	670.4	5.42	0.0	9.81	669.5	2.98	0.0	9.80	680.6	4.0	441.9	21.6	-0.33	1.04	0.1	0.0	85.8	117.61
October 29, 2021	9.80	670.0	0.00	0.0	9.80	669.9	5.28	0.0	9.80	669.4	3.01	0.0	9.80	679.9	4.0	482.2	22.1	-0.32	1.04	0.1	0.0	396.5	
October 30, 2021	9.80	670.2	0.00	0.0	9.80	670.2	4.63	0.0	9.80	669.4	2.68	0.0	9.80	680.1	4.7	644.2	22.3	-0.32	1.05	0.1	0.0	456.2	
October 31, 2021	9.80	670.2	0.00	0.0	9.80	670.2	4.02	0.0	9.80	669.8	2.40	0.0	9.80	680.0	4.0	509.2	22.2	-0.31	1.05	0.1	0.0	335.7	
Avg	9.80	667.4	0.76	7.8	9.80	662.8	5.89	198.5	9.81	654.7	4.30	10.7	9.82	657.6	7.5	1365.8	21.5	-0.33	1.04	0.1	0.0	291.0	78.0
Min	9.68	562.2	0.00	0.0	9.74	536.2	4.02	0.0	9.79	554.7	1.31	0.0	9.78	525.8	0.9	51.8	20.3	-0.36	0.98	0.1	0.0	10.3	4.4
Max	9.87	698.4	3.00	243.3	9.87	699.4	7.11	1115.5	10.02	669.8	6.93	171.7	10.11	702.7	14.0	5566.1	22.3	-0.31	1.08	0.1	0.0	771.9	117.6

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
November 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
November 1, 2021	9.83	673.1	0.10	0.0	9.81	669.4	3.75	0.0	9.81	681.1	2.24	0.0	9.80	689.3	3.0	369.5	22.3	-0.31	1.04	0.1	0.0	232.4	
November 2, 2021	9.79	670.1	0.32	0.0	9.80	670.4	4.43	0.0	9.78	667.1	5.37	0.0	9.79	679.8	6.1	1010.8	21.9	-0.48	0.77	0.1	0.0	164.5	
November 3, 2021	9.74	670.3	0.34	0.0	9.80	670.0	4.61	0.0	9.80	667.4	5.52	0.0	9.80	680.0	6.0	917.9	22.0	-0.52	0.53	0.1	0.0	106.1	
November 4, 2021	9.80	669.8	0.26	0.0	9.79	669.0	4.68	0.0	9.81	666.3	5.51	0.0	9.81	679.9	6.3	957.2	21.6	-0.43	0.45	0.1	0.0	429.3	83.13
November 5, 2021	9.80	670.2	0.16	0.0	9.81	671.4	5.52	0.0	9.79	666.4	5.61	0.0	9.80	679.9	5.3	749.2	21.3	-0.44	0.45	0.1	0.0	252.4	
November 6, 2021	9.81	670.1	0.24	0.0	9.79	669.4	4.46	0.0	9.80	665.8	7.03	0.0	9.80	679.7	6.5	1092.1	10.2	-0.51	0.35	0.1	0.0	643.8	
November 7, 2021	9.80	670.3	0.21	0.0	9.79	669.1	4.87	0.0	9.80	666.5	5.44	0.0	9.80	680.1	5.8	962.4	1.3	-0.02	0.01	0.1	0.0	571.5	
November 8, 2021	9.80	669.9	0.25	0.0	9.81	671.1	5.08	0.0	9.80	666.2	5.96	0.0	9.80	680.0	5.3	821.7	0.8	0.01	-0.01	0.1	0.0	333.7	
November 9, 2021	9.79	669.5	0.12	0.0	9.81	677.4	2.57	0.0	9.80	666.3	5.46	0.0	9.80	680.0	5.0	722.7	7.5	-0.31	0.29	0.0	0.0	25.0	
November 10, 2021	9.81	670.4	0.09	0.0	9.80	669.0	4.51	241.1	9.77	666.5	4.98	32.3	9.80	680.0	4.6	707.3	11.6	-0.50	0.46	0.1	0.0	19.6	
November 11, 2021	9.80	669.7	0.00	0.0	9.80	670.1	4.61	602.1	9.81	667.1	4.83	0.0	9.80	679.9	5.1	801.6	21.0	-0.42	0.46	0.1	0.0	59.4	
November 12, 2021	9.80	669.9	0.02	0.0	9.80	669.3	4.71	609.2	9.80	667.0	5.65	0.0	9.80	680.0	5.2	784.9	22.0	-0.43	0.45	0.1	0.0	43.7	32.01
November 13, 2021	9.80	670.3	0.06	0.0	9.80	670.1	5.05	633.3	9.80	665.7	6.09	0.0	9.80	679.9	5.5	841.8	21.4	-0.44	0.44	0.1	0.0	29.0	
November 14, 2021	9.80	669.7	0.03	0.0	9.80	669.9	4.65	581.8	9.80	665.9	6.50	0.0	9.80	679.9	5.6	867.9	21.6	-0.42	0.45	0.1	0.0	32.8	
November 15, 2021	9.80	673.6	0.11	0.0	9.80	670.9	4.84	695.2	9.82	673.1	5.32	0.0	9.80	683.7	4.3	583.8	21.6	-0.42	0.45	0.1	0.0	4.7	
November 16, 2021	9.74	670.3	0.00	0.0	9.81	667.6	4.02	678.0	9.79	667.6	4.53	0.0	9.80	680.0	3.9	562.0	22.1	-0.42	0.44	0.1	0.0	127.0	
November 17, 2021	9.80	669.9	0.01	0.0	9.80	670.7	3.48	587.4	9.80	668.0	4.69	0.0	9.80	679.9	3.9	613.5	22.6	-0.41	0.47	0.1	0.0	79.7	
November 18, 2021	9.81	700.8	0.28	1.1	9.80	670.0	3.77	725.0	9.82	666.1	5.39	0.0	9.79	680.0	5.0	780.8	22.2	-0.42	0.45	0.1	0.0	9.2	4.17
November 19, 2021	9.80	669.9	0.00	0.0	9.80	669.9	3.94	733.5	9.80	667.1	5.43	0.0	9.80	680.0	4.4	684.2	22.4	-0.42	0.44	0.1	0.0	20.7	
November 20, 2021	9.81	670.1	0.00	0.0	9.80	669.7	3.93	685.6	9.81	668.0	4.89	0.0	9.80	679.9	5.4	869.8	22.6	-0.41	0.45	0.1	0.0	37.9	
November 21, 2021	9.79	672.4	0.00	0.0	9.80	669.8	4.00	666.6	9.80	667.8	4.47	0.0	9.80	680.0	4.9	805.0	22.5	-0.41	0.45	0.1	0.0	63.5	
November 22, 2021	9.80	670.0	0.00	0.0	9.80	670.0	4.63	802.7	9.80	668.0	4.37	0.0	9.80	680.0	3.8	494.9	21.4	-0.42	0.44	0.1	0.0	5.0	
November 23, 2021	9.81	670.1	0.00	0.0	9.80	670.1	3.95	655.1	9.80	667.7	4.40	2.3	9.80	680.0	4.7	693.0	22.2	-0.42	0.44	0.1	0.0	19.4	38.57
November 24, 2021	9.79	669.7	0.00	0.0	9.80	670.0	3.92	622.8	9.80	667.7	3.80	0.0	9.80	680.0	3.7	551.2	22.7	-0.39	0.45	0.1	0.0	44.3	
November 25, 2021	9.75	671.4	0.02	0.0	9.78	667.3	3.58	624.9	9.93	657.6	3.82	11.6	9.89	675.8	4.0	680.3	20.5	-0.12	0.16	0.1	0.0	4.3	
November 26, 2021	9.80	670.0	0.00	0.0	9.80	670.4	4.07	616.3	9.81	668.5	2.97	0.0	9.81	680.1	3.4	458.9	19.5	0.06	-0.01	0.1	0.0	0.6	
November 27, 2021	9.80	669.8	0.00	0.0	9.80	670.1	3.30	492.1	9.80	667.6	3.03	0.0	9.80	679.9	4.2	649.5	20.0	0.07	0.00	0.1	0.0	17.1	
November 28, 2021	9.80	669.9	0.00	0.0	9.80	667.6	3.15	533.2	9.79	668.1	3.03	0.0	9.80	680.0	4.2	574.2	19.4	0.07	-0.01	0.1	0.0	13.0	
November 29, 2021	9.80	670.0	0.00	0.0	9.80	669.8	3.37	519.2	9.80	667.6	2.43	0.0	9.80	679.9	3.0	359.0	20.1	-0.08	0.13	0.1	0.0	0.0	
November 30, 2021	9.80	670.0	0.00	0.0	9.80	670.2	3.77	611.3	9.84	667.5	2.71	0.0	9.80	680.1	4.0	567.9	21.7	-0.41	0.45	0.1	0.0	0.2	
Avg	9.80	671.4	0.09	0.0	9.80	670.0	4.17	430.5	9.81	667.4	4.72	1.5	9.80	680.2	4.7	717.8	19.0	-0.32	0.38	0.1	0.0	113.0	39
Min	9.74	669.5	0.00	0.0	9.78	667.3	2.57	0.0	9.77	657.6	2.24	0.0	9.79	675.8	3.0	359.0	0.8	-0.52	-0.01	0.0	0.0	0.0	4
Max	9.83	700.8	0.34	1.1	9.81	677.4	5.52	802.7	9.93	681.1	7.03	32.3	9.89	689.3	6.5	1092.1	22.7	0.07	1.04	0.1	0.0	643.8	83

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
December 2021

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
December 1, 2021	9.77	669.5	0.00	0.0	9.79	669.1	3.72	498.5	9.82	666.3	2.33	0.0	9.78	680.4	3.2	367.0	21.0	-0.42	0.43	0.1	0.0	3.5	4.71
December 2, 2021	9.80	669.8	0.00	0.0	9.80	669.6	3.49	398.8	9.81	667.7	2.21	0.0	9.80	680.0	3.2	302.4	21.8	-0.42	0.44	0.1	0.0	10.5	
December 3, 2021	9.80	670.6	0.00	0.0	9.81	670.9	3.49	432.4	9.88	661.8	2.37	0.0	9.80	680.0	3.3	330.7	22.2	-0.42	0.45	0.1	0.0	2.5	
December 4, 2021	9.80	670.0	0.00	0.0	9.80	669.8	3.65	496.8	9.89	660.1	2.49	0.9	9.80	679.9	3.7	398.4	22.8	-0.40	0.44	0.1	0.0	6.7	
December 5, 2021	9.81	669.8	0.00	0.0	9.80	669.4	3.63	445.9	9.82	667.0	2.33	0.0	9.80	680.1	3.6	418.6	23.6	-0.40	0.46	0.1	0.0	33.4	
December 6, 2021	9.80	670.1	0.00	0.0	9.80	669.7	3.98	474.9	9.58	667.6	2.54	1.2	9.80	679.1	2.7	277.4	23.3	-0.40	0.44	0.1	0.0	87.3	
December 7, 2021	9.80	669.9	0.29	0.0	9.80	669.5	4.63	562.1	9.85	666.1	2.59	0.0	9.79	679.9	3.2	357.3	22.7	-0.39	0.44	0.1	0.0	91.5	
December 8, 2021	9.78	670.1	0.13	0.0	9.80	670.4	12.77	544.9	9.80	665.1	3.47	0.0	9.80	680.1	6.5	448.6	21.9	-0.41	0.43	0.1	0.0	16.9	
December 9, 2021	9.81	669.5	0.13	0.0	9.80	670.6	13.89	403.8	9.80	666.9	2.32	0.0	9.80	680.0	7.0	399.6	22.1	-0.40	0.43	0.1	0.0	28.9	
December 10, 2021	9.81	670.0	0.23	0.0	9.80	669.3	14.82	428.0	9.80	666.8	2.86	0.0	9.80	680.2	8.5	540.7	22.1	-0.41	0.43	0.1	0.0	2.3	3.42
December 11, 2021	9.80	670.0	0.19	0.0	9.80	669.6	14.44	417.8	9.80	665.8	2.85	0.0	9.80	680.7	9.8	626.3	21.8	-0.40	0.42	0.1	0.0	5.8	
December 12, 2021	9.79	670.2	0.05	0.0	9.79	669.3	15.58	432.7	9.80	666.5	3.06	0.0	9.80	680.4	8.3	511.8	22.0	-0.40	0.44	0.1	0.0	12.0	
December 13, 2021	9.81	670.0	0.12	0.0	9.81	670.8	15.96	382.6	9.81	667.8	2.76	0.0	9.81	680.2	7.3	453.6	23.2	-0.39	0.45	0.1	0.0	11.8	
December 14, 2021	9.80	669.9	0.08	0.0	9.80	670.0	16.78	420.7	9.80	667.5	2.72	0.0	9.80	680.1	6.8	427.4	23.8	-0.39	0.43	0.1	0.0	0.6	
December 15, 2021	9.80	671.0	0.14	0.0	9.80	670.3	14.39	348.3	9.80	667.6	2.24	0.0	9.80	680.1	6.5	423.6	24.0	-0.39	0.44	0.1	0.0	17.2	
December 16, 2021	9.80	670.1	0.00	0.0	9.80	670.2	14.07	286.9	9.80	668.1	2.04	0.0	9.80	680.2	6.9	463.9	24.1	-0.39	0.44	0.1	0.0	7.9	
December 17, 2021	9.81	669.9	0.00	0.0	9.80	669.7	13.39	323.7	9.80	668.6	1.97	0.0	9.80	680.0	5.6	354.8	24.5	-0.39	0.45	0.1	0.0	19.9	13.22
December 18, 2021	9.80	669.8	0.00	0.0	9.80	669.7	15.92	397.5	9.80	667.8	3.04	0.0	9.80	680.1	7.3	479.7	24.0	-0.38	0.43	0.1	0.0	3.9	
December 19, 2021	9.80	670.1	0.00	0.0	9.80	669.5	16.32	472.0	9.80	667.5	2.70	0.0	9.80	680.0	7.1	434.9	22.9	-0.40	0.43	0.1	0.0	1.3	
December 20, 2021	9.56	671.0	0.00	1.6	9.45	672.5	16.12	1047.0	9.80	668.4	2.44	0.0	9.56	681.2	6.3	480.2	23.3	-0.40	0.44	0.1	0.0	19.5	
December 21, 2021	9.62	707.0	0.00	0.4	9.77	669.5	19.63	895.1	9.79	667.9	3.27	0.0	9.80	680.1	9.9	640.7	22.7	-0.40	0.43	0.0	0.0	3.2	
December 22, 2021	9.80	672.6	0.00	0.1	9.84	671.4	16.28	648.8	9.80	667.2	3.30	0.0	9.80	680.2	8.8	583.6	22.8	-0.40	0.43	0.1	0.0	1.6	
December 23, 2021	9.80	670.1	0.00	0.0	9.80	669.9	14.06	529.9	9.87	657.2	3.02	5.3	9.81	680.2	2.9	583.6	23.3	-0.40	0.43	0.1	0.0	24.0	38.95
December 24, 2021	9.80	669.9	0.00	0.0	9.79	669.9	10.62	264.7	9.80	667.9	3.00	0.0	9.80	680.3	7.9	591.0	24.7	-0.39	0.43	0.1	0.0	82.0	
December 25, 2021	9.81	670.0	0.00	0.0	9.70	667.9	11.12	6.2	9.80	655.2	2.63	0.0	9.79	679.9	7.4	540.4	24.8	-0.39	0.44	0.1	0.0	86.3	
December 26, 2021	9.80	670.0	0.00	0.0	9.88	673.6	7.80	0.0	9.80	669.0	2.66	0.0	9.80	680.1	9.0	677.3	24.6	-0.39	0.44	0.1	0.0	31.2	
December 27, 2021	9.80	670.0	0.00	0.0	9.80	669.4	6.50	1.2	9.81	670.5	1.64	0.0	9.80	680.2	7.8	591.5	23.5	-0.39	0.44	0.1	0.0	0.0	
December 28, 2021	9.80	670.0	0.00	0.0	9.81	670.1	5.82	42.3	9.80	670.3	1.12	0.0	9.80	680.1	7.1	565.6	22.8	-0.39	0.42	0.1	0.0	0.0	16.3
December 29, 2021	9.80	670.0	0.00	0.0	9.70	671.6	5.67	39.3	9.81	679.1	0.67	0.0	9.80	680.1	6.7	504.4	24.5	-0.39	0.42	0.1	0.0	0.0	
December 30, 2021	9.80	675.9	0.00	0.0	9.79	669.1	6.94	8.9	9.79	669.8	0.58	0.0	9.82	687.1	5.8	464.7	24.2	-0.38	0.42	0.1	0.0	0.0	
December 31, 2021	9.80	669.9	0.00	0.0	9.78	669.8	7.96	177.5	9.80	670.0	0.66	0.0	9.80	680.1	7.2	786.7	24.4	-0.39	0.43	0.1	0.0	366.8	
Avg	9.79	671.5	0.04	0.1	9.78	670.1	10.76	381.6	9.80	666.9	2.38	0.2	9.79	680.4	6.4	484.7	23.2	-0.40	0.44	0.1	0.0	31.6	15.32
Min	9.56	669.5	0.00	0.0	9.45	667.9	3.49	0.0	9.58	655.2	0.58	0.0	9.56	679.1	2.7	277.4	21.0	-0.42	0.42	0.0	0.0	0.0	3.42
Max	9.81	707.0	0.29	1.6	9.88	673.6	19.63	1047.0	9.89	679.1	3.47	5.3	9.82	687.1	9.9	786.7	24.8	-0.38	0.46	0.1	0.0	366.8	38.95

Appendix E – Scrubber Chemicals

2021 Scrubber Bleach Usage (L as delivered 16% sodium hypochlorite solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	1379	748	1041	885	932	929	1407	1154	1497	1658	959	1127
2	1445	768	943	839	861	1117	1820	1103	1376	1657	1321	1233
3	1273	862	593	1033	980	1219	1982	1233	1486	1615	1252	1019
4	1327	787	554	1201	975	1115	1680	1284	1612	1615	1285	1043
5	1391	714	548	1341	1024	1387	1918	1348	1633	1615	1333	1097
6	1451	689	465	1229	1165	1212	1822	1163	1627	1615	1403	1202
7	1168	727	767	1211	1059	1578	1650	1274	1713	1846	1397	1335
8	1244	663	511	1213	694	1588	1403	1175	1781	1372	1413	1433
9	1390	351	663	1536	453	1420	1231	1101	1824	1536	1103	1363
10	1405	427	767	1386	765	1362	1215	1383	1736	1741	1289	1753
11	1449	320	741	1215	800	727	1365	1656	1530	1820	1369	1571
12	1347	305	737	962	785	988	1436	1744	1961	1699	1304	1811
13	1287	371	557	1203	940	1133	1541	1855	1511	1430	1436	1423
14	1141	385	463	1403	973	1054	1698	1556	1702	1483	1445	1417
15	1073	408	538	1363	1056	1367	1641	1737	1433	1704	1286	1439
16	1073	347	678	923	922	1462	1667	1621	1470	1677	943	1492
17	995	620	694	680	1003	1282	1624	2063	1562	1512	1053	1371
18	1003	514	757	778	555	1508	1520	2061	1820	1569	1042	1517
19	1070	845	751	925	257	1459	1565	2125	1501	2282	1080	1457
20	946	867	839	733	222	1632	1476	1839	1549	2615	1051	1199
21	1256	878	1034	816	341	1697	1444	1798	1389	1711	1125	1303
22	1122	780	979	724	402	1538	875	1834	1527	1492	1096	1213
23	940	645	1059	752	477	1660	874	1371	1172	1304	1065	1084
24	881	620	1232	766	501	1715	1088	1140	1311	898	1129	1196
25	845	646	850	740	725	1651	1062	1490	1546	1041	1130	1198
26	800	429	1021	745	564	1568	1110	1422	1383	1594	1079	1400
27	823	827	1138	897	840	1611	1126	2033	1548	1325	1089	918
28	777	990	1032	977	793	1938	1147	1477	1626	1283	1057	840
29	761		677	895	908	1667	1044	1459	1594	1211	1069	720
30	767		947	896	953	1509	1103	1404	1505	1223	1011	718
31	727		959		876		1140	1471		1101		750
Total (kg)	**34,556**	**17,532**	**24,535**	**30,268**	**23,800**	**42,095**	**43,671**	**47,373**	**46,927**	**48,242**	**35,614**	**38,646**

2021 Scrubber Caustic Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	116	65	95	73	67	98	105	104	103	149	128	128
2	108	95	62	55	77	105	133	92	123	155	139	125
3	101	91	69	78	42	106	134	129	129	165	126	122
4	109	90	68	90	90	106	112	111	128	169	119	110
5	104	72	67	91	80	115	140	113	136	128	129	118
6	106	80	64	83	73	123	144	94	123	140	129	121
7	114	79	77	84	67	102	163	120	137	140	129	179
8	113	73	63	81	90	116	132	116	134	132	132	156
9	123	68	68	114	76	112	131	94	142	132	72	157
10	112	56	73	52	78	116	146	96	152	164	124	145
11	117	44	69	89	88	105	162	153	149	143	120	122
12	111	54	68	93	107	94	161	153	173	162	100	157
13	95	47	64	104	107	95	157	163	141	97	133	161
14	111	40	52	121	98	81	149	131	174	130	112	144
15	86	58	62	144	113	98	143	146	129	157	106	132
16	90	59	70	88	91	100	144	149	136	134	99	133
17	86	65	64	73	89	94	132	178	129	108	94	121
18	80	67	71	80	74	145	141	186	141	121	107	119
19	69	82	74	92	59	136	133	177	131	136	100	164
20	102	74	78	70	64	141	118	160	129	152	83	138
21	73	82	82	80	85	137	116	155	113	122	87	179
22	91	79	96	63	74	148	105	150	140	153	105	160
23	46	63	82	65	66	143	114	148	128	155	90	138
24	79	70	93	80	65	156	109	142	115	109	95	139
25	66	69	78	67	94	152	101	94	118	137	103	145
26	63	60	84	67	64	156	117	99	140	169	105	157
27	65	74	78	63	90	146	125	128	121	156	94	123
28	85	79	79	81	74	153	114	101	135	149	96	115
29	65		73	68	112	139	114	110	138	132	99	98
30	65		70	73	119	122	121	98	132	141	75	105
31	64		76		95		116	93		136		105
Total (kg)	**2,817**	**1,933**	**2,269**	**2,461**	**2,568**	**3,642**	**4,033**	**3,982**	**4,019**	**4,373**	**3,229**	**4,216**

Appendix F – Fence Line H2S Readings

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
January 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
January 1, 2021	0	0	0	3.73	0	0	0	0	
January 2, 2021	3.21	0	0	0	0	0	0	0	
January 3, 2021	0	0	0	0	0	0	0	0	
January 4, 2021	0	0	0	0	0	0	0	0	
January 5, 2021	5.83	0	0	3.08	3.89	8.28	5.78	0	
January 6, 2021	0	0	0	0	0	0	0	0	
January 7, 2021	0	0	0	0	0	0	0	0	
January 8, 2021	0	0	0	0	0	0	0	0	
January 9, 2021	0	0	0	0	0	0	0	0	
January 10, 2021	0	0	0	0	0	0	0	0	
January 11, 2021	9.01	5.98	0	0	0	0	0	0	
January 12, 2021	7.92	3.3	3.52	5.54	4.98	4.7	10.9	7.91	
January 13, 2021	0	3.9	0	0	0	0	0	0	
January 14, 2021	23.09	0	0	0	0	0	0	0	
January 15, 2021	10.14	3.28	0	3.47	3.22	5.69	4.24	0	
January 16, 2021	7.04	4.9	3.08	0	4.44	0	0	0	
January 17, 2021	0	0	0	0	0	3.07	0	0	
January 18, 2021	5.71	3.23	0	0	0	0	0	0	
January 19, 2021	4.63	0	0	0	0	0	0	0	
January 20, 2021	0	0	0	0	0	0	0	0	
January 21, 2021	7.67	4.89	5.14	3.7	0	0	0	0	
January 22, 2021	4.81	0	0	0	0	0	0	0	
January 23, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 24, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 25, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 26, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low.
January 27, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 28, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 29, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
January 30, 2021	0	0	0	0	0	0	3.28	0	
January 31, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low.

Avg	3.87	1.28	0.51	0.85	0.72	0.95	1.05	0.34
Min	0	0	0	0	0	0	0	0
Max	23.09	5.98	5.14	5.54	4.98	8.28	10.90	7.91

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
February 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
February 1, 2021	9.91	0	3.77	11.12	0	0	0	0	
February 2, 2021	0	0	0	0	0	0	0	0	
February 3, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 4, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 5, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 6, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 7, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 8, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 9, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 10, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low.
February 11, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 12, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 13, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 14, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 15, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 16, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
February 17, 2021	0	3.07	0	0	3.11	20.4	0	0	
February 18, 2021	4.73	4.49	3.34	3.18	6.32	4.19	18.71	3.84	
February 19, 2021	12.97	4.95	3.4	0	0	0	0	0	
February 20, 2021	0	0	0	3.18	3.53	4.6	5.74	3.03	
February 21, 2021	0	0	0	0	0	3.69	4.93	0	
February 22, 2021	3.11	4.87	0	0	3.33	0	0	0	
February 23, 2021	3.3	0	0	3	4.59	0	0	0	
February 24, 2021	3.43	4.21	0	0	3.29	0	0	0	
February 25, 2021	3.08	0	0	3.54	0	0	0	0	
February 26, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low.
February 27, 2021	0	0	0	0	0	0	0	0	
February 28, 2021	3.41	0	0	3.18	0	0	0	0	

Avg	3.38	1.66	0.81	2.09	1.86	2.53	2.26	0.53
Min	0	0	0	0	0	0	0	0
Max	12.97	4.95	3.77	11.12	6.32	20.4	18.71	3.84

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
March 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
March 1, 2021	0	0	0	0	0	0	0	0	
March 2, 2021	4.38	0	0	0	0	0	0	0	
March 3, 2021	12.04	0	3.98	3.88	3.45	0	4.06	4.86	
March 4, 2021	0	0	0	3.94	0	0	0	3.13	
March 5, 2021	0	0	0	0	0	0	0	0	
March 6, 2021	0	0	0	0	0	0	0	0	
March 7, 2021	7.86	5.9	3.95	0	0	0	0	0	
March 8, 2021	10.08	0	6.28	4	0	0	0	0	
March 9, 2021	0	0	0	0	0	0	0	0	
March 10, 2021	0	4.01	0	0	0	0	0	0	
March 11, 2021	3.82	0	0	0	0	0	0	0	
March 12, 2021	9.67	0	0	0	0	0	0	0	
March 13, 2021	0	0	0	0	0	0	0	0	
March 14, 2021	0	0	0	0	0	0	0	0	
March 15, 2021	0	0	0	0	0	0	0	0	
March 16, 2021	0	0	0	0	0	0	0	0	
March 17, 2021	0	0	0	0	0	0	0	0	
March 18, 2021	0	0	0	0	0	0	0	0	
March 19, 2021	0	0	0	0	0	0	0	0	
March 20, 2021	0	0	7.22	6.13	0	0	0	0	
March 21, 2021	0	0	0	0	0	0	0	0	
March 22, 2021	0	0	0	0	0	0	0	0	
March 23, 2021	0	0	0	0	0	0	0	0	
March 24, 2021	0	0	0	0	0	0	0	0	
March 25, 2021	0	0	0	0	0	0	0	0	
March 26, 2021	3.9	0	0	0	0	0	0	0	
March 27, 2021	0	0	0	0	0	0	0	0	
March 28, 2021	0	0	0	0	0	0	0	3.09	
March 29, 2021	0	3.72	0	0	0	0	0	0	
March 30, 2021	0	6.36	0	0	0	0	0	0	
March 31, 2021	0	3.17	0	0	0	0	0	0	

Avg	1.67	0.75	0.69	0.58	0.11	0	0.13	0.36
Min	0	0	0	0	0	0	0	0
Max	12.04	6.36	7.22	6.13	3.45	0	4.06	4.86

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
April 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
April 1, 2021	0	0	0	0	0	0	0	0	
April 2, 2021	0	5.14	0	4.1	0	0	0	3.03	
April 3, 2021	0	0	0	0	0	0	0	4.04	
April 4, 2021	0	3.13	0	0	0	0	0	0	
April 5, 2021	3.02	3.81	4.22	0	0	0	3.3	0	
April 6, 2021	0	0	0	0	0	0	0	0	
April 7, 2021	0	3.44	0	0	0	1.4	3.48	0	
April 8, 2021	0	0	0	3.02	0	0	0	0	
April 9, 2021	0	0	0	4.51	0	0	0	0	
April 10, 2021	0	0	0	0	0	0	0	0	
April 11, 2021	4.45	0	0	0	0	0	0	0	
April 12, 2021	0	0	0	0	0	0	0	0	
April 13, 2021	6.8	0	0	0	0	0	3.04	0	
April 14, 2021	0	0	0	3.94	0	0	0	0	
April 15, 2021	0	5.97	0	3.95	0	0	0	0	
April 16, 2021	0	0	0	6.12	0	0	0	0	
April 17, 2021	3.05	0	0	0	0	0	0	0	
April 18, 2021	0	0	0	0	0	0	0	0	
April 19, 2021	0	0	0	0	0	0	0	0	
April 20, 2021	4.36	0	0	3.4	0	0	0	0	
April 21, 2021	0	0	0	0	0	0	0	0	
April 22, 2021	0	0	0	0	0	0	0	3.41	
April 23, 2021	0	0	0	0	0	0	0	0	
April 24, 2021	0	0	0	0	0	0	0	0	
April 25, 2021	3.67	0	0	0	0	0	0	0	
April 26, 2021	0	0	0	0	0	0	0	0	
April 27, 2021	0	0	0	0	0	0	0	0	
April 28, 2021	0	0	0	0	0	0	0	0	
April 29, 2021	0	0	0	0	0	0	0	0	
April 30, 2021	5.18	0	0	11.08	0	0	0	0	

Avg	1.02	0.72	0.14	1.34	0	0.05	0.33	0.35
Min	0	0	0	0	0	0	0	0
Max	6.8	5.97	4.22	11.08	0	1.4	3.48	4.04

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
May 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
May 1, 2021	9.96	0	0	0	0	0	0	0	
May 2, 2021	0	0	0	3.25	0	0	0	0	
May 3, 2021	0	0	0	0	0	0	0	0	
May 4, 2021	0	0	0	0	0	0	0	0	
May 5, 2021	0	0	3.03	0	0	0	0	0	
May 6, 2021	0	0	0	0	0	0	0	3.58	
May 7, 2021	3.28	3.07	4.24	8.27	0	0	0	4.89	
May 8, 2021	0	0	0	0	0	0	0	0	
May 9, 2021	3.2	0	0	0	0	0	0	0	
May 10, 2021	0	0	0	0	0	0	0	0	
May 11, 2021	0	0	0	7.22	0	0	0	0	
May 12, 2021	0	0	0	0	0	0	0	0	
May 13, 2021	0	0	0	0	0	0	0	0	
May 14, 2021	0	0	0	0	0	0	0	0	
May 15, 2021	0	0	0	0	0	0	0	0	
May 16, 2021	0	0	0	0	0	0	0	0	
May 17, 2021	0	0	0	22.59	0	0	0	0	
May 18, 2021	0	0	0	0	0	0	0	0	
May 19, 2021	0	0	0	0	0	0	0	0	
May 20, 2021	0	0	0	0	0	0	0	0	
May 21, 2021	0	0	0	0	0	0	0	0	
May 22, 2021	3.48	3.56	0	0	0	0	0	0	
May 23, 2021	0	0	0	0	0	0	0	0	
May 24, 2021	0	0	0	0	0	0	0	0	
May 25, 2021	0	0	5.1	3.72	0	0	0	0	
May 26, 2021	0	0	0	0	0	0	0	0	
May 27, 2021	0	0	0	0	0	0	0	0	
May 28, 2021	0	0	0	0	0	0	0	0	
May 29, 2021	0	5.3	0	0	0	0	0	0	
May 30, 2021	8.13	14.65	0	0	0	0	0	0	
May 31, 2021	0	0	0	0	0	0	0	0	

Avg	0.90	0.86	0.40	1.45	0	0	0	0.27
Min	0	0	0	0	0	0	0	0
Max	9.96	14.65	5.1	22.59	0	0	0	4.89

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
June 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
June 1, 2021	3.42	0	0	0	0	0	0	0.142	
June 2, 2021	0	0	0	0	0	0	0	0	
June 3, 2021	0	0	0	0	0	0	0	0	
June 4, 2021	0	4.49	0	8.29	0	0	0	3.37	
June 5, 2021	9.66	7.56	0	0	0	0	0	0	
June 6, 2021	0	0	0	0	0	0	0	0	
June 7, 2021	6.24	0	7.77	7.66	0	0	0	0	
June 8, 2021	25.02	7.13	0	7.74	0	0	0	0	
June 9, 2021	3.63	0	0	9.67	0	0	3.13	0	
June 10, 2021	4.79	0	0	3.38	0	0	0	0	
June 11, 2021	0	0	0	0	0	0	0	0	
June 12, 2021	0	0	0	0	0	0	0	0	
June 13, 2021	0	0	0	4.38	0	0	0	0	
June 14, 2021	3.19	0	4.46	3.18	3.6	0	0	0	
June 15, 2021	0	4.16	0	0	0	0	0	0	
June 16, 2021	13.24	4.3	0	0	0	4.12	4.3	0	
June 17, 2021	13.24	4.3	0	0	0	4.12	4.3	0	
June 18, 2021	3.02	0	0	0	0	0	0	0	
June 19, 2021	0	0	0	0	0	0	0	0	
June 20, 2021	0	4.54	0	0	0	0	0	0	
June 21, 2021	0	0	0	0	0	0	3.07	0	
June 22, 2021	3.85	0	0	0	0	0	0	0	
June 23, 2021	0	3.46	0	0	0	0	0	0	
June 24, 2021	3.64	3.24	0	0	0	0	0	0	
June 25, 2021	5.23	0	0	0	0	0	0	0	
June 26, 2021	4.98	0	3.49	0	0	0	3.84	0	
June 27, 2021	0	0	0	3.69	0	0	0	0	
June 28, 2021	4.51	3.18	0	3.35	0	0	3.36	0	
June 29, 2021	3.02	0	7.33	4.98	0	0	5.73	0	
June 30, 2021	0.14	0	3.11	6.32	0	3.66	3.51	7.78	

Avg	4	2	0.87	2.09	0	0	1	0.38
Min	0	0	0	0	0	0	0	0
Max	25.02	7.56	7.77	9.67	3.6	4.12	5.73	7.78

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
July 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
July 1, 2021	0	0	0	0	3.66	7.24	0	0	
July 2, 2021	0	0	0	0	0	0	0	0	
July 3, 2021	0	0	0	0	3.01	7.28	19.4	0	
July 4, 2021	4.34	0	5.39	0	0	0	0	0	
July 5, 2021	6.03	0	0	0	0	0	0	0	
July 6, 2021	34.98	0	0	0	0	3.24	0	4.33	
July 7, 2021	3.44	0	4.61	3.11	3.67	0	5.39	0	
July 8, 2021	15.63	3.18	24.09	11.27	0	0	4.43	3.16	
July 9, 2021	0	3.52	0	15.46	0	0	3.61	0	
July 10, 2021	189	5.58	0	0	0	4.42	3.4	0	
July 11, 2021	189	0	0	0	0	0	0	0	
July 12, 2021	0	0	0	0	0	4.08	0	0	
July 13, 2021	3.03	0	0	0	0	0	4.05	0	
July 14, 2021	7.53	4.01	3.2	3.27	0	0	0	5.51	
July 15, 2021	8.5	0	0	8.61	0	10.44	0	0	
July 16, 2021	25.96	5.15	11.87	9.38	0	0	0	4.97	
July 17, 2021	10.3	0	0	0	0	0	0	0	
July 18, 2021	0	0	3.03	0	0	0	0	3.65	
July 19, 2021	0	0	5.6	6.03	0	0	0	0	
July 20, 2021	0	4.94	5.03	8.5	0	0	0	5.19	
July 21, 2021	10.63	5.05	5.93	7.72	0	0	0	4.41	
July 22, 2021	12.13	0	0	19.09	0	0	0	0	
July 23, 2021	0	3.72	0	0	0	0	3.79	0	
July 24, 2021	0	0	0	0	0	0	0	0	
July 25, 2021	0	0	0	0	0	0	0	0	
July 26, 2021	0	0	0	4.74	0	0	0	0	
July 27, 2021	0	0	0	0	0	0	0	0	
July 28, 2021	3.28	0	0	5.78	0	0	0	0	
July 29, 2021	48.08	5.51	6.54	0	0	0	54.06	0	
July 30, 2021	0	4.19	0	16.45	0	0	0	0	
July 31, 2021	4.08	0	0	0	0	0	14.23	0	

Avg	19	1	2.43	3.85	0.33	1	3.62	1
Min	0	0	0	0	0	0	0	0
Max	189	5.58	24.09	19.09	3.67	10.44	54.06	5.51

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
August 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
August 1, 2021	4.99	0	3.26	0	0	0	3.7	0	
August 2, 2021	12.17	0	0	0	0	0	0	0	
August 3, 2021	0	3.43	0	0	0	5.04	0	0	
August 4, 2021	3.79	0	0	0	0	0	4.56	0	
August 5, 2021	0	0	0	4.93	0	3.29	0	0	
August 6, 2021	5.35	3.14	0	0	0	0	0	0	
August 7, 2021	0	0	0	0	0	0	0	0	
August 8, 2021	0	0	0	0	0	0	0	0	
August 9, 2021	68.06	0	0	0	0	0	10.32	3.26	
August 10, 2021	3.93	0	0	0	0	0	0	0	
August 11, 2021	0	0	0	0	0	0	0	0	
August 12, 2021	0	0	0	0	0	0	0	0	
August 13, 2021	3.65	0	0	0	0	3.56	0	0	
August 14, 2021	0	0	0	5.98	0	0	0	0	
August 15, 2021	36.7	0	0	0	0	4.21	0	0	
August 16, 2021	0	4.11	0	0	0	0	0	0	
August 17, 2021	0	0	0	3.33	0	0	0	0	
August 18, 2021	9.12	0	0	0	0	0	4.31	0	
August 19, 2021	5.1	0	0	0	0	0	0	0	
August 20, 2021	12.3	0	5.53	24.92	0	0	0	0	
August 21, 2021	7.91	0	0	0	0	0	0	3.66	
August 22, 2021	0	9.58	0	0	0	0	0	0	
August 23, 2021	3.95	0	0	0	0	0	0	13.55	
August 24, 2021	3.57	0	0	0	0	0	4.27	0	
August 25, 2021	3.47	0	3.97	0	0	0	0	0	
August 26, 2021	37.91	0	0	12.83	0	0	0	0	
August 27, 2021	0	0	3.01	0	0	3.83	0	0	
August 28, 2021	0	4.22	0	0	0	0	0	0	
August 29, 2021	8.14	0	0	4.99	0	0	0	0	
August 30, 2021	30.63	23.88	0	6.28	0	0	0	0	
August 31, 2021	0	5.21	0	0	0	3.9	0	0	

Avg	8.41	1.73	0.51	2.04	0.00	0.77	0.88	0.66
Min	0	0	0	0	0	0	0	0
Max	68.06	23.88	5.53	24.92	0	5.04	10.32	13.55

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
September 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
September 1, 2021	3.83	4.95	0	0	0	0	0	0	
September 2, 2021	3.72	0	3.02	3.33	0	0	0	0	
September 3, 2021	0	0	0	4.92	0	0	0	0	
September 4, 2021	12.56	0	0	0	0	0	0	3.32	
September 5, 2021	3.44	0	0	0	0	0	0	0	
September 6, 2021	0	4.57	0	0	0	0	0	0	
September 7, 2021	53.45	10.07	0	0	0	6.56	47.56	0	
September 8, 2021	15.19	23.3	3.37	11.39	0	0	0	3.28	
September 9, 2021	0	9.3	3.54	0	0	0	3.48	0	
September 10, 2021	0	0	0	0	0	0	0	0	
September 11, 2021	51.95	0	0	0	0	0	10.75	0	
September 12, 2021	33.03	7.96	0	0	15.48	0	6.73	38.54	
September 13, 2021	6.07	0	0	0	3.8	3.67	0	0	
September 14, 2021	0	0	0	0	0	0	0	0	
September 15, 2021	0	0	0	0	0	0	0	0	
September 16, 2021	3.69	0	0	0	0	5.02	0	0	
September 17, 2021	27.23	0	0	0	0	0	0	3.15	
September 18, 2021	31.4	5.37	3.39	0	6.22	0	0	0	
September 19, 2021	0	0	0	0	0	3.82	0	0	
September 20, 2021	22.62	0	0	3.69	0	5.16	0	0	
September 21, 2021	4.11	0	0	0	3.04	0	7.25	0	
September 22, 2021	0	0	3.62	3.72	4.1	0	0	0	
September 23, 2021	0	0	0	0	5.37	6.06	0	0	
September 24, 2021	13.41	5.34	0	0	0	0	0	0	
September 25, 2021	11.07	0	0	0	0	0	5.54	0	
September 26, 2021	11.54	0	0	0	0	0	0	0	
September 27, 2021	3.02	0	5.05	5.1	0	0	3.2	0	
September 28, 2021	0	3.87	3.79	0	0	0	0	0	
September 29, 2021	0	0	0	0	0	4.75	4.26	0	
September 30, 2021	4.3	0	0	0	0	0	24.51	0	

Avg	10.52	2.49	1	1.07	1	1.17	4	2
Min	0	0	0	0	0	0	0	0
Max	53.45	23.3	5.05	11.39	15.48	6.56	47.56	38.54

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
October 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
October 1, 2021	6.76	3.59	3.46	0	0	0	0	0	
October 2, 2021	21.5	0	0	0	0	0	0	0	
October 3, 2021	10.08	3.71	0	0	0	0	0	0	
October 4, 2021	0	0	0	0	0	0	0	3.14	
October 5, 2021	3.09	0	0	0	0	0	0	0	
October 6, 2021	5.3	0	0	0	0	0	0	0	
October 7, 2021	33.2	0	0	0	3.04	0	13.63	5.53	
October 8, 2021	3.69	5.74	0	0	0	0	0	0	
October 9, 2021	0	0	3.06	0	0	0	8.14	0	
October 10, 2021	4	3.98	0	0	0	5.65	0	0	
October 11, 2021	0	0	0	0	0	0	0	0	
October 12, 2021	0	0	0	0	0	0	0	9.42	
October 13, 2021	0	0	0	0	0	0	0	0	
October 14, 2021	10.8	7.1	0	0	0	0	0	0	
October 15, 2021	#NA	#NA	#NA	#NA	#NA	#NA	#NA	#NA	
October 16, 2021	20.63	0	0	0	0	0	5.79	0	
October 17, 2021	3.5	0	0	0	0	3.2	0	0	
October 18, 2021	0	0	0	4.8	0	0	0	0	
October 19, 2021	0	0	0	0	0	0	19.47	0	
October 20, 2021	0	0	0	0	0	0	0	0	
October 21, 2021	29.24	0	6.21	8.28	0	0	0	0	
October 22, 2021	11.94	3.92	0	3	0	0	3.98	4.2	
October 23, 2021	15.95	0	0	0	0	0	0	0	
October 24, 2021	15.92	0	0	0	0	0	0	0	
October 25, 2021	0	3.35	0	3.5	0	0	3.93	3.2	
October 26, 2021	0	0	0	0	0	0	0	0	
October 27, 2021	0	0	0	0	0	0	0	0	
October 28, 2021	0	0	0	0	0	0	0	0	
October 29, 2021	0	0	0	0	0	0	0	0	
October 30, 2021	4.82	3.24	0	0	0	0	0	0	
October 31, 2021	0	0	0	0	0	0	0	0	

Avg	6.68	1.15	0.42	0.65	0.10	0.30	1.83	0.85
Min	0	0	0	0	0	0	0	0
Max	33.2	7.1	6.21	8.28	3.04	5.65	19.47	9.42

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
November 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
November 1, 2021	5.92	0	0	0	0	0	0	0	
November 2, 2021	4.73	0	0	0	0	0	0	0	
November 3, 2021	3.04	0	0	0	0	0	0	0	
November 4, 2021	0	0	3.38	7.77	0	0	3.22	4.81	
November 5, 2021	0	3.17	0	0	0	3.69	0	0	
November 6, 2021	19.03	0	0	0	0	0	0	0	
November 7, 2021	19.24	0	0	0	0	0	0	0	
November 8, 2021	8.17	0	0	0	0	0	0	0	
November 9, 2021	3.21	0	0	0	0	0	0.143	4.8	
November 10, 2021	0	0	0	0	0	0	0	0	
November 11, 2021	7.31	0	0	5.31	0	0	0	4.33	
November 12, 2021	0	0	0	7.31	0	0	12.77	3.25	
November 13, 2021	0	0	0	0	3.98	7.13	3.32	0	
November 14, 2021	0	0	0	3.29	0	0	3.09	3.43	
November 15, 2021	0	0	3.37	4.698	0	0	4.04	0	
November 16, 2021	4.88	0	0	5.5	0	0	0	0	
November 17, 2021	3.81	0	3.08	0	4.55	0	3.92	0	
November 18, 2021	4.84	0	0	0	0	0	3.39	3.88	
November 19, 2021	0	4.20	0	0	3.95	0	0	0	
November 20, 2021	0	0	0	12.11	0	0	0	0	
November 21, 2021	0	0	7.46	0	0	0	7.78	0	
November 22, 2021	4.49	0	0	0	0	0	11.8	0	
November 23, 2021	0	4.84	3.87	3.65	0	0	0	0	
November 24, 2021	12.21	0	0	0	3.15	0	4.01	0	
November 25, 2021	0	3.18	0	0	3.58	0	3.53	0	
November 26, 2021	0	0	0	0	6.21	4.29	5.01	0	
November 27, 2021	14.49	10.12	0	3.21	0	3.11	8.44	5.89	
November 28, 2021	81.79	8.57	4.82	0	4.25	0	15.5	0	
November 29, 2021	0	5.24	3.99	4.46	0	0	0	0	
November 30, 2021	12.57	4.10	3.6	3.2	4.06	3.91	0	0	

Avg	6.99	1.45	1.12	1.93	1.12	0.74	3.00	1.01
Min	0	0	0	0	0	0	0	0
Max	81.79	10.12	7.46	12.11	6.21	7.13	15.5	5.89

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Fenceline H_2S Readings
December 2021

Date	H_2S (ppb)								Comments
	1	2	3	4	5	6	7	8	
December 1, 2021	0	3.62	0	0	0	8.28	0	0	
December 2, 2021	0	4.23	3.7	11.17	0	0	0	0	
December 3, 2021	0	3.04	0	0	3.45	6.73	11.65	0	
December 4, 2021	8.33	0	0	0	3.83	5.01	0	0	
December 5, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 6, 2021	7.23	3.36	0	0	3.86	6.47	0	0	
December 7, 2021	3.94	4.01	4.08	3.57	5.47	5.34	5.1	4.75	
December 8, 2021	16.64	5.3	0	7.33	5.35	0	5.44	0	
December 9, 2021	0	0	0	0	0	5.81	0	0	
December 10, 2021	0	0	0	0	3.26	5	3.91	0	
December 11, 2021	3.8	5.46	0	0	4.07	7.1	0	0	
December 12, 2021	4.24	0	0	0	3.32	3.44	3.1	0	
December 13, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 14, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 15, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 16, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 17, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 18, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 19, 2021	11.96	5.91	3	0	0	5.77	0	0	
December 20, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 21, 2021	4.7	4.05	3.78	4.16	5.14	5.64	14.6	3.87	
December 22, 2021	42.14	0	3.31	10.09	0	0	0	0	
December 23, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 24, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 25, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 26, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 27, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 28, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 29, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 30, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low
December 31, 2021	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Temperature too low

Avg	7.36	2.78	1.28	2.59	2.70	4.61	3.13	0.62
Min	0	0	0	0	0	0	0	0
Max	42.14	5.91	4.08	11.17	5.47	8.28	14.6	4.75

Appendix G – Odour Complaints

#	Date	Location	Complaint Description	Call Back Details	Wind Direction	Scrubber Status	Maintenance Activities	Action Taken	Is GBWWTP the Likely Source (Y/N)	Consistent with EnviroSuite Model?
2021-001	**1/20/2021**	**4616 – 109A Ave**	**"UNUSUAL SMELL COMING FROM THE G.B.W.W.T.P. SMELL DESCRIBED AS SULPHUR. ODOUR IS INSIDE AND OUTSIDE. INTENSITY IS A 8 OUT 10. REPORTING SHE NOTICED THE SMELL ON JAN 20/2021 AT 15:20. THIS IS A REOCCURRING"**	**Customer was called back 4:24 pm Jan 20 (same day) This complaint is in our response area, but we could not find any source at the plant. Our odour model does not flag anything unusual coming from the plant, our scrubbers are operating well. Fence line H2S monitoring is showing normal levels. We talked to the customer and they noted that the sulfur smell was also coming from inside their home. Sometimes they noticed that smell when their water softener was getting low on salt. They smelled something fait outside and thought our biogas flare may have blown out at the plant in the high winds, and therefore thought it was possibly from the plant. We assured her that our flare was still lit and everything was running safely. Forwarded the complaint to Drainage for investigation**	**From NE, but very strong gusts**	**Online**	**N/A**	**Forwarded back to drainage ops control for further investigation reference number: 488897**	**N**	**N**
2021-002	**3/5/2021**	**4804 109 Ave**	**Details of customer odour complaint: STRONG SEWER ODOUR FROM PLANT Description: SEWER Odour inside or outside: OUTSIDE Description of odour: SMELLS LIKE SEWAGE Odour intensity (scale from 1-10): 10 Time noticed odour and for how long: THIS MORNING AND ALL DAY Is it a reoccurring issue? AT TIMES**	**Customer was called back at 3:35 PM. "Based on Envirosuite and I am currently on Envirosuite now I do not believe we are the cause, I talked to the foreman and they say no H2S coming into the plant. He will do some fence line monitoring at the diversion structure with the Jerome meter and as right now Envirosuite shows no plume at all. I talked to family member as caller was not home and relayed the same message and that it could be from the sewer system near their address." Forwarded complaint to drainage for further investigation.**	**Varying**	**Operational**	**N/A**	**Checked Envirosuite - no odour plume at customer location throughout day. Talked to Control Room, no H2S coming into the plant. Control Room will do fence line monitoring with the Jerome meter at the Diversion Structure. Forwarded to Drainage Ops for further investigation.**	**N**	**N**
2021-003	**3/6/2021**	**6720 93A Ave**	**CUSTOMER SAYS ISSUE IS HAPPENING IN IDELWYLDE, GOLDBAR, AND OTTEWELL ONGOING FOR THE LAST HOUR. Details of customer odour complaint: EXTREME ODOUR IN THE ABOVE NEIGHBORHOODS. SMELLS LIKE SKUNK Description: Odour inside or outside: OUTSIDE Description of odour: SKUNKY Odour intensity (scale from 1-10): 10 Time noticed odour and for how long: FOR THE LAST HOUR Is it a reoccurring issue?**	**Called customer back and left a voicemail. Forwarded complaint to drainage for further investigation.**	**E to NW**	**Operational**	**N/A**	**Based on wind direction from the time of the call the wind was E to NW which was not the direction of the address of the complaint. No H_2S issues noted from permanent gas detection at the plant as well. Email sent to Drainage Operations for follow up: "We have investigated this odour complaint from south west of the plant and could not determine that the odour originated from Gold Bar WWTP. Our odour model does not show any odour plume in this location and all of our scrubbers have been operational all night. Spot readings along the fence line with our H2S meter all came back at 0 ppb with the exception of the west side of the plant which read 3 ppb after the control room was notified last night. The wind direction was the opposite going south east to north west. Can Drainage investigate further to see if the odour possibly came from the collection system at this location?"**	**N**	**N**
2021-004	**3/25/2021**	**109A Ave**	**Email received from AEP: "Please be advised that the Alberta EDGE Environmental Reporting Hotline has received the following complaint: Caller is reporting a hydrogen odour complaint coming from the Gold Bar Wastewater Treatment plant in Edmonton. Caller first noticed the odour when he first went outside around 06:30**	**No customer information available. Responded to AEP contact.**	**From NE**	**Operational**	**N/A**	**- Followed up with AEP regarding the location of the odour complaint to determine if GBWWTP could be the cause - Odour location reported to be on 109A Avenue (customer information is confidential) - Confirmed the scrubbers are operational - Checked Envirosuite to confirm that the wind was primarily from the NE this morning**	**Y**	**Y**

			this morning. Caller states the odour is still ongoing. On a scale of 1-10 with 10 being the strongest caller would rate the odour an 8. Caller states there doesn't appear to be much windy today. Incident Date and Time: 3/25/2021 6:30 AM Please conduct an investigation regarding any potential fugitive emissions or upsets in accordance with authorization # 639-03-06 and advise if there may be any potential for the causation resulting in the odor complaint. I look forward to your response via this email address."					- Conducted fence line H2S readings with the Jerome meter (all 0 ppb) - Operations is monitoring the plant for other possible sources of odour – no unusual activities - No 7-day letter required		
2021-005	4/20/2021	4615 109A Ave	Details of customer odour complaint: OUTSDE SEWER ODOUR FROM TREATMENT PLANT Description: STRONG ENOUGH ODOUR THAT THEY CAN'T OPEN THE WINDOWS WITHOUT IT FILLING THE HOUSE Odour inside or outside: OUTSIDE Description of odour: SEWAGE Odour intensity (scale from 1-10): 6-7 Time noticed odour and for how long: ONGOING FOR 10 YEARS SINCE HE MOVED INTO HOUSE Is it a reoccurring issue? YES	Called customer back	From NE	Operational	Washing Secondary 10	Set up EcoSorb mister south of Bio 10. Fence line H2S readings taken: - Sec 10 North: 6.39 ppb - Sec 10 South: 4.39 ppb - Bio 6: 3.40 ppb - Main Gate: 4.36 ppb	Y	Y
2021-006	5/3/2021	4430 Ada Blvd	Details of customer odour complaint: SEWER ODOUR, COMING FROM ACROSS THE RIVER FROM THE PLANT. Description: Odour inside or outside: OUTSIDE Description of odour: SEWAGE Odour intensity (scale from 1-10): 8 Time noticed odour and for how long: SINCE 6 AM TODAY Is it a reoccurring issue? CONSTANT ISSUE	Called customer back	From SE	Operational	N/A	Reviewed Envirosuite and odour trajectory path. "Based on this I believe it may be from the refinery area but having the Operator take measurements along the north fence line by Secondary 11,6 and 3 along with by the fermenter area fence line. Wind direction was from the SE to NW at the time of the complaint. Thanks"	N	N
2021-007	5/6/2021	10320 29 St	Details of customer odour complaint: outside odour from Gold Bar REALLY bad over the past couple day's Description: Odour inside or outside: Outside Description of odour: Really disgustingly smelly Odour intensity (scale from 1-10):10/10 Time noticed odour and for how long: noticed over the past couple day's now and getting worse Is it a reoccurring issue? Yes	Forwarded complaint to drainage for further investigation.	From S	Operational	N/A	Reviewed Envirosuite and fence line H2S readings. All readings were 0 in the morning and immediately after the complaint except at the EPT gate (3.58 ppb and 4.85 ppb). Emailed DROPS Control: "To whom it may concern, Based on wind direction for the last couple of days and trajectory of air plume around that area Gold Bar would not be the cause. Please investigate. Thank you"	N	N
2021-008	6/2/2021	10643 43 St NW	"This is an email from EER Dispatch… ODOUR FROM GOLD BAR FOR THE LAST 3 DAYS WOULD LIKE A CALLBACK"	Called customer back at 11:55 am June 2. Reported that we are currently draining Bio/Clarifier 3 and should be complete in the next few days.	From NW	Operational	Bio & Secondary 3 draining	Ensured that odour misters at north and south side of Bio/Secondary 3 are active (they were). Reviewed Envirosuite for wind direction and speed history over last 36 hours	Y	Y
2021-009	7/5/2021	No address provided	Details of customer odour complaint: Odour inside or outside: OUTSIDE Description of odour: H2S SEWER SMELL	Customer was called back at 9:48 am on July 7 after initial investigation took place. Customer declined to provide the location / address of where they odour was detected. The results of our investigation was	From NE	Working	N/A	Envirosuite model was reviewed - light wind from the NE, but no unusual plume of odour detected at SW side of plant. Scrubbers were working normally. No wet weather	N	N

			Odour intensity (scale from 1-10): 6 Time noticed odour and for how long: SINCE 3PM ON JULY 05, 2021, 6 HRS Is it a reoccurring issue? NO	provided to the caller, and they were informed that we would forward the complaint to DROPS control for further investigation.				flows at that time. Phoned customer back - they declined to provide their address, but said the odour was detected somewhere south west of the plant. Complaint was forwarded back to DROPS control for further investigation at 10:10 am July 6.		
2021-010	7/16/2021	3846 Ada Blvd	Details of odour complaint: sewer odour from Gold Bar started about 21:30 hrs tonight. Very bad smell. Details of customer odour complaint: sewer odour from Gold Bar Odour inside or outside: outside Description of odour: sewer smell Odour intensity (scale from 1-10): 8 Time noticed odour and for how long: 21:30 hrs Is it a reoccurring issue? At times from the plant	Called customer back. Forwarded complaint to drainage for further investigation.	From East	Working	Secondary 5 draining	Wind direction would not place Gold Bar as the source of odour. Investigation on site found no odour, plant and scrubbers were running well. Sent complaint back to DROPS control for investigation.	N	N
2021-011	7/25/2021	4504 109A Ave NW	Details of customer odour complaint: outside odour Odour inside or outside Description of odour: smells like sewage Odour intensity (scale from 1-10): didn't say Time noticed odour and for how long: 18:00 Is it a reoccurring issue? Said normally the area is good but has occurred before. they live directly south of Bio 5	Called customer back on July 25 at 8 pm: "Called the caller back - let them know we have some maintenance taking place over the next 2 days, then should go back to normal. Let them know we made some adjustments with our air in that out of service tank after their call, which has shown an improvement and have deployed additional equipment to help mitigate the odour (odour misters). They are very appreciative. Have been there since 1989 and wanted to mention that in the last few years there has been a huge improvement in odour coming from the plant. "	From North	Online	Bio 5 partially drained for upcoming work	Checked Envirosuite - showed wind from north Operator Foreman took Jerome readings along park road south of Bio at about 7:30 pm. Found up to 205 ppb south of Bio 5. They decided to shut off the air in the bio, and reading dropped to 21 ppb. Air was left off overnight. Odour misters also were in place.	Y	Y
2021-012	9/18/2021	4428 109A Ave NW	Details of customer odor complaint: it's very strong tonight and she had to close all the windows in the house. Odour inside or outside: inside and outside. Description of odour: very strong pungent. Odour intensity (scale from 1-10):10 Time noticed odour and for how long: 7:48 PM for a few hours. Is it a reoccurring issue? Just tonight she did say it's not usually this bad.	Called customer back and left message. The following morning at 9:30 am (Sunday morning). Noted that investigation last night did not locate any sources of odour (scrubbers working properly, no H2S hits on Jerome meter) at Gold Bar and the complaint was forwarded to drainage for further investigation.	Generally from north (from plant)	Online	N/A	Shift crews were contacted around 9:30 pm and they completed a sweep of the plant and extra Jerome meter readings - no sources of odour found. Sent complaint back to Drainage to investigate	N	N
2021-013	10/1/2021	4616 109A Ave NW	Details of customer odour complaint: the worst ever that they experienced Odour inside or outside both Description of odour: sewer smell pungent Odour intensity (scale from 1-10): 10 Time noticed odour and for how long: 8:30 PM Is it a reoccurring issue? It's the worst	Called customer back at 1:51 pm Oct 2 (Saturday) "I talked to the person that phoned and she said it was not a sewage odour but a sewer odour and explained to me she saw the flares out from around 8:30 pm to 9:30 pm. I explained to her that she may not have seen the pilot light in the flame but she says she sees it on all the time as she can see the flare from her kitchen, I told her I would check trends Monday morning for the flares. I believe they were not out and the pilot flame was on, I did notice a sulfur smell Friday afternoon when I went for a walk, the flare was in and could of been exhaust from a boiler." Forwarded complaint to drainage for further investigation.	From NW, but very light	Working	Draining down scrubber bleach tanks for leak repair, so were using bleach totes	Checked scrubber status. Checked Jerome readings. After discussion with caller, it was confirmed on Monday that the flares did not shut off. Complaint sent back to Drainage ops for further investigation	N	N

Appendix H – Nutri-Gold Summary

Substance Loading Rates on Nutrigold Fields - 2021

Nutrigold Field #2021NE265419					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
3550.55	23.9	849	120	49	17.3	TP	24971	21200	433				
						TN	42157	35791	730				
						NH4-N	8810	7480	153				
Landowner		Tim Plypchuk				As	5.1	4.33	0.088				
Legal Description		NE-26-54-19-4				Cd	2.7	2.29	0.047	15614	1500	9249	600
Start Date		16-Apr-21				Cr	59	50.1	1.02	715	20	423	8
End Date		29-Apr-21				Cu	482	409	8.35	87	15	52	6
Soil Class		Class 1				Pb	30	25.5	0.520	1405	20	832	8
Biosolids Type		Digested				Mn	313	266	5.42				
		Centrifuge Dewatered				Hg	1.14	0.968	0.020	36980	3000	21904	1100
						Ni	34	28.9	0.589	1240	100	734	40
						Se	5.4	4.58	0.094				
						Zn	790	671	13.7	53	10	32	4
						Co	5.4	5	0.1				

Nutrigold Field #2021NE155418					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
8099	6.81	551	88	35	15.7	TP	28190	15533	444				
						TN	32442	17876	511				
						NH4-N	16325	8995	257				
Landowner		Dale Bowes				As	6.60	3.64	0.104				
Legal Description		NE-15-54-18-4				Cd	3.50	1.93	0.055	9269	1500	8054	600
Start Date		3-May-21				Cr	181	99.7	2.85	179	20	156	8
End Date		6-May-21				Cu	327	180	5.15	99	15	86	6
Soil Class		Class 1				Pb	59.0	32.5	0.929	550	20	478	8
Biosolids Type		Digested				Mn	348	192	5.48				
		Gravity Thickened				Hg	1.48	0.815	0.023	21920	3000	19047	1100
						Ni	49	27.0	0.771	662	100	575	40
						Se	15.1	8.32	0.238				
						Zn	677	373	10.7	48	10	42	4
						Co	10.20	6	0.2				

Nutrigold Field #2021NE105519					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
20287	7.13	1448	160	65	22.3	TP	28190	40819	628				
						TN	32442	46976	723				
						NH4-N	16325	23639	364				
Landowner		Eldon Pearce				As	6.60	9.56	0.147				
Legal Description		NE-10-55-19-4				Cd	3.50	5.07	0.078	9269	1500	8054	600
Start Date		7-May-21				Cr	181	262.1	4.03	179	20	156	8
End Date		27-May-22				Cu	327	473	7.28	99	15	86	6
Soil Class		Class 1				Pb	59.0	85.4	1.314	550	20	478	8
Biosolids Type		Digested				Mn	348	504	7.75				
		Gravity Thickened				Hg	1.48	2.143	0.033	21920	3000	19047	1100
						Ni	49	71.0	1.092	662	100	575	40
						Se	15.1	21.86	0.336				
						Zn	677	980	15.1	48	10	42	4
						Co	10.20	15	0.2				

Nutrigold Field #2021NW105519					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
8637	7.10	618	100	41	15.1	TP	28190	17421	425				
						TN	32442	20049	489				
						NH4-N	16325	10089	246				
Landowner		Eldon Pearce				As	6.60	4.08	0.099				
Legal Description		NW-10-55-19-4				Cd	3.50	2.16	0.053	9269	1500	8054	600
Start Date		27-Oct-21				Cr	181	111.9	2.73	179	20	156	8
End Date		31-Oct-21				Cu	327	202	4.93	99	15	86	6
Soil Class		Class 1				Pb	59.0	36.5	0.889	550	20	478	8
Biosolids Type		Digested				Mn	348	215	5.25				
		Gravity Thickened				Hg	1.48	0.915	0.022	21920	3000	19047	1100
						Ni	49	30.3	0.739	662	100	575	40
						Se	15.1	9.33	0.228				
						Zn	677	418	10.2	48	10	42	4
						Co	10.20	6	0.2				

Nutrigold Field #2021NE145214					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
13660	6.20	853	90	37	23.1	TP	28190	24046	650				
						TN	32442	27673	748				
						NH4-N	16325	13925	376				
Landowner		Earnie Warawa				As	6.60	5.63	0.152				
Legal Description		NE-14-52-14-4				Cd	3.50	2.99	0.081	9269	1500	8054	600
Start Date		23-Jun-21				Cr	181	154.4	4.17	179	20	156	8
End Date		29-Jun-21				Cu	327	279	7.54	99	15	86	6
Soil Class		Class 1				Pb	59.0	50.3	1.360	550	20	478	8
Biosolids Type		Digested				Mn	348	297	8.02				
		Gravity Thickened				Hg	1.48	1.262	0.034	21920	3000	19047	1100
						Ni	49	41.8	1.130	662	100	575	40
						Se	15.1	12.88	0.348				
						Zn	677	577	15.6	48	10	42	4
						Co	10.20	9	0.2				

Nutrigold Field #2021SW025519					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
27455	5.60	1546	158	64	24.2	TP	28190	43582	681				
						TN	32442	50155	784				
						NH4-N	16325	25238	394				
Landowner		Robel Holding				As	6.60	10.20	0.159				
Legal Description		SW-02-55-19-4				Cd	3.50	5.41	0.085	9269	1500	8054	600
Start Date		2-Jul-21				Cr	181	279.8	4.37	179	20	156	8
End Date		31-Oct-21				Cu	327	506	7.90	99	15	86	6
Soil Class		Class 1				Pb	59.0	91.2	1.425	550	20	478	8
Biosolids Type		Digested				Mn	348	538	8.41				
		Gravity Thickened				Hg	1.48	2.288	0.036	21920	3000	19047	1100
						Ni	49	75.8	1.184	662	100	575	40
						Se	15.1	23.34	0.365				
						Zn	677	1047	16.4	48	10	42	4
						Co	10.20	16	0.2				

Nutrigold Field #2021SE155519					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
13278	5.40	717	80	32	22.4	TP	28190	20212	632				
						TN	32442	23261	727				
						NH4-N	16325	11705	366				
Landowner		Rick Ruzycki				As	6.60	4.73	0.148				
Legal Description		SE-15-55-19-4				Cd	3.50	2.51	0.078	9269	1500	8054	600
Start Date		3-Jul-21				Cr	181	129.8	4.06	179	20	156	8
End Date		7-Jul-21				Cu	327	234	7.33	99	15	86	6
Soil Class		Class 1				Pb	59.0	42.3	1.322	550	20	478	8
Biosolids Type		Digested				Mn	348	250	7.80				
		Centrifuge Dewatered				Hg	1.48	1.061	0.033	21920	3000	19047	1100
						Ni	49	35.1	1.098	662	100	575	40
						Se	15.1	10.83	0.338				
						Zn	677	485	15.2	48	10	42	4
						Co	10.20	7	0.2				

Nutrigold Field #2021SW305116					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2050	5.5	113	13	5	22.6	TP	28190	3185	637				
						TN	32442	3666	733				
						NH4-N	16325	1845	369				
Landowner		Ron Kozoway				As	6.60	0.75	0.149				
Legal Description		SW-30-51-16-4				Cd	3.50	0.40	0.079	9269	1500	8054	600
Start Date		8-Jul-21				Cr	181	20.5	4.09	179	20	156	8
End Date		9-Jul-21				Cu	327	37	7.39	99	15	86	6
Soil Class		Class 1				Pb	59.0	6.7	1.333	550	20	478	8
Biosolids Type		Digested				Mn	348	39	7.86				
		Centrifuge Dewatered				Hg	1.48	0.167	0.033	21920	3000	19047	1100
						Ni	49	5.5	1.107	662	100	575	40
						Se	15.1	1.71	0.341				
						Zn	677	77	15.3	48	10	42	4
						Co	10.20	1	0.2				

Nutrigold Field #2020SW295622					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
4602	24.1	1086	162	66	16.5	TP	22900	24869	377				
						TN	15300	16616	252				
						NH4-N	8820	9579	145				
Landowner		Kalco				As	7.1	7.71	0.117				
Legal Description		SW-29-56-22-4				Cd	2.7	2.98	0.045	5584	1500	8358	600
Start Date		1-Dec-20				Cr	58	63.2	0.96	263	20	393	8
End Date		14-Dec-20				Cu	446	484	7.34	34	15	51	6
Soil Class		Class 3				Pb	34.4	37.4	0.566	445	20	666	8
Biosolids Type		Digested				Mn	290	315	4.77				
		Centrifuge Dewatered				Hg	1.08	1.173	0.018	14167	3000	21204	1100
						Ni	33.9	36.8	0.558	451	100	676	40
						Se	5	5.43	0.082				
						Zn	746	810	12.3	21	10	31	4
						Co	5.3	6	0.1				

Nutrigold Field #2020SE295622					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2265	23.6	545	142	58	9.4	TP	24971	13609	235				
						TN	42157	22976	396				
						NH4-N	8810	4801	83				
Landowner		Kalco				As	5.1	2.78	0.048				
Legal Description		SE-29-56-22-4				Cd	2.7	1.47	0.025	15614	1500	9249	600
Start Date		14-Dec-20				Cr	59	32.2	0.55	715	20	423	8
End Date		23-Dec-20				Cu	482	263	4.53	87	15	52	6
Soil Class		Class 3				Pb	30	16.4	0.282	1405	20	832	8
Biosolids Type		Digested				Mn	313	171	2.94				
		Centrifuge Dewatered				Hg	1.14	0.621	0.011	36980	3000	21904	1100
						Ni	34	18.5	0.319	1240	100	734	40
						Se	5.4	2.94	0.051				
						Zn	790	431	7.4	53	10	32	4
						Co	5.4	3	0.1				

Nutrigold Field #2020NW205622					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2540	23.1	587	148	60	9.8	TP	22900	13442	224				
						TN	15300	8981	150				
						NH4-N	8820	5177	86				
Landowner		Kalco				As	7.1	4.17	0.069				
Legal Description		NW-20-56-22-4				Cd	2.7	1.61	0.027	5584	1500	8358	600
Start Date		20-Dec-20				Cr	58	34.2	0.57	263	20	393	8
End Date		1-Feb-21				Cu	446	262	4.36	34	15	51	6
Soil Class		Class 3				Pb	34.4	20.2	0.337	445	20	666	8
Biosolids Type		Digested				Mn	290	170	2.84				
		Centrifuge Dewatered				Hg	1.08	0.634	0.011	14167	3000	21204	1100
						Ni	33.9	19.9	0.332	451	100	676	40
						Se	5	2.94	0.049				
						Zn	746	438	7.3	21	10	31	4
						Co	5.3	3	0.1				

Nutrigold Field #2021NW205622					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
1779	23.6	421	104	60	7.0	TP	24971	10513	175				
						TN	42157	17748	296				
						NH4-N	8810	3709	62				
Landowner		Kalco				As	5.1	2.15	0.036				
Legal Description		NE-20-56-22-4				Cd	2.7	1.14	0.019	15614	1500	9249	600
Start Date		18-Jan-21				Cr	59	24.8	0.41	715	20	423	8
End Date		1-Feb-21				Cu	482	203	3.38	87	15	52	6
Soil Class		Class 3				Pb	30	12.6	0.211	1405	20	832	8
Biosolids Type		Digested				Mn	313	132	2.20				
		Centrifuge Dewatered				Hg	1.14	0.480	0.008	36980	3000	21904	1100
						Ni	34	14.3	0.239	1240	100	734	40
						Se	5.4	2.27	0.038				
						Zn	790	333	5.5	53	10	32	4
						Co	5.4	2	0.0				

Nutrigold Field #2021SE/SW205622					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
3762	23.6	882	270	109	8.1	TP	24971	22024	202				
						TN	42157	37182	341				
						NH4-N	8810	7770	71				
Landowner		Kalco				As	5.1	4.50	0.041				
Legal Description		SE/SW 20-56-22-4				Cd	2.7	2.38	0.022	15614	1500	9249	600
Start Date		9-Jan-21				Cr	59	52.0	0.48	715	20	423	8
End Date		18-Jan-21				Cu	482	425	3.90	87	15	52	6
Soil Class		Class 3				Pb	30	26.5	0.243	1405	20	832	8
Biosolids Type		Digested				Mn	313	276	2.53				
		Centrifuge Dewatered				Hg	1.14	1.005	0.009	36980	3000	21904	1100
						Ni	34	30.0	0.275	1240	100	734	40
						Se	5.4	4.76	0.044				
						Zn	790	697	6.4	53	10	32	4
						Co	5.4	5	0.0				

Nutrigold Field					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
4052	23.7	961	120	49	19.6	TP	24971	23997	490				
						TN	42157	40513	827				
						NH4-N	8810	8466	173				
Landowner		Diane Skrudys				As	5.1	4.90	0.100				
Legal Description		NW-20-55-18-4				Cd	2.7	2.59	0.053	15614	1500	9249	600
Start Date		7-May-21				Cr	59	56.7	1.16	715	20	423	8
End Date		29-Oct-21				Cu	482	463	9.45	87	15	52	6
Soil Class		Class 1				Pb	30	28.8	0.588	1405	20	832	8
Biosolids Type		Digested				Mn	313	301	6.14				
		Centrifuge Dewatered				Hg	1.14	1.096	0.022	36980	3000	21904	1100
						Ni	34	32.7	0.667	1240	100	734	40
						Se	5.4	5.19	0.106				
						Zn	790	759	15.5	53	10	32	4
						Co	5.4	5	0.1				

Appendix I – Third Party Agricultural Summary

Substance Loading Rates on Olstad turnkey Fields - 2021

Olstad Field OC-01					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
45666	7.00%	3225	344	139	23.2	TP	28190	90913	654				
						TN	32442	104625	753				
						NH4-N	16325	52648	379				
Landowner		Dwayne Mayowski				As	6.60	21.29	0.153				
Legal Description		NW-36-53-19-4				Cd	3.50	11.29	0.081	9269	1500	8054	600
Start Date		25-May-21				Cr	181	583.7	4.20	179	20	156	8
End Date		18-Jun-21				Cu	327	1055	7.59	99	15	86	6
Soil Class		Class 1				Pb	59.0	190.3	1.369	550	20	478	8
Biosolids Type		Digested				Mn	348	1122	8.07				
		Gravity Thickened				Hg	1.48	4.773	0.034	21920	3000	19047	1100
						Ni	49	158.0	1.137	662	100	575	40
						Se	15.1	48.70	0.350				
						Zn	677	2183	15.7	48	10	42	4
						Co	10.20	33	0.2				

Olstad Field OC-02					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
21172	4.97%	1053	125	51	20.6	TP	28190	29684	582				
						TN	32442	34161	670				
						NH4-N	16325	17190	337				
Landowner		Bill Bilan				As	6.60	6.95	0.136				
Legal Description		NE-08-53-19-4				Cd	3.50	3.69	0.072	9269	1500	8054	600
Start Date		13-Jul-21				Cr	181	190.6	3.74	179	20	156	8
End Date		18-Jul-21				Cu	327	344	6.75	99	15	86	6
Soil Class		Class 1				Pb	59.0	62.1	1.218	550	20	478	8
Biosolids Type		Digested				Mn	348	366	7.19				
		Gravity Thickened				Hg	1.48	1.558	0.031	21920	3000	19047	1100
						Ni	49	51.6	1.012	662	100	575	40
						Se	15.1	15.90	0.312				
						Zn	677	713	14.0	48	10	42	4
						Co	10.20	11	0.2				

Substance Loading Rates on Olstad turnkey Fields - 2021

Olstad Field OC-03					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
41821	6.66%	2786	291	118	23.6	TP	28190	78537	666				
						TN	32442	90383	766				
						NH4-N	16325	45481	385				
Landowner		Tim Milligan				As	6.60	18.39	0.156				
Legal Description		NW/SW-28-56-23				Cd	3.50	9.75	0.083	9269	1500	8054	600
Start Date		19-Aug-21				Cr	181	504.3	4.27	179	20	156	8
End Date		10-Sep-21				Cu	327	911	7.72	99	15	86	6
Soil Class		Class 1				Pb	59.0	164.4	1.393	550	20	478	8
Biosolids Type		Digested				Mn	348	970	8.22				
		Gravity Thickened				Hg	1.48	4.123	0.035	21920	3000	19047	1100
						Ni	49	136.5	1.157	662	100	575	40
						Se	15.1	42.07	0.357				
						Zn	677	1886	16.0	48	10	42	4
						Co	10.20	28	0.2				

Olstad Field OC-04					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
18719	7.10%	1329	145	59	22.5	TP	28190	37465	635				
						TN	32442	43115	731				
						NH4-N	16325	21696	368				
Landowner		Tim Milligan				As	6.60	8.77	0.149				
Legal Description		NW-36-56-24-4				Cd	3.50	4.65	0.079	9269	1500	8054	600
Start Date		13-Sep-21				Cr	181	240.5	4.08	179	20	156	8
End Date		20-Sep-21				Cu	327	435	7.37	99	15	86	6
Soil Class		Class 1				Pb	59.0	78.4	1.329	550	20	478	8
Biosolids Type		Digested				Mn	348	462	7.84				
		Gravity Thickened				Hg	1.48	1.967	0.033	21920	3000	19047	1100
						Ni	49	65.1	1.104	662	100	575	40
						Se	15.1	20.07	0.340				
						Zn	677	900	15.2	48	10	42	4
						Co	10.20	14	0.2				

Substance Loading Rates on Olstad turnkey Fields - 2021

Olstad Field OC-05					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
8743	6.66%	582.00	64	26	22.4	TP	28190	16407	631				
						TN	32442	18881	726				
						NH4-N	16325	9501	365				
Landowner		Craig Simes				As	6.60	3.84	0.148				
Legal Description		NW-20-56-23-4				Cd	3.50	2.04	0.078	9269	1500	8054	600
Start Date		21-Sep-21				Cr	181	105.3	4.05	179	20	156	8
End Date		23-Sep-21				Cu	327	190	7.32	99	15	86	6
Soil Class		Class 1				Pb	59.0	34.3	1.321	550	20	478	8
Biosolids Type		Digested				Mn	348	203	7.79				
		Gravity Thickened				Hg	1.48	0.861	0.033	21920	3000	19047	1100
						Ni	49	28.5	1.097	662	100	575	40
						Se	15.1	8.79	0.338				
						Zn	677	394	15.2	48	10	42	4
						Co	10.20	6	0.2				

Olstad Field OC-06					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
36012	6.38%	2298	260	105	21.9	TP	28190	64781	617				
						TN	32442	74552	710				
						NH4-N	16325	37515	357				
Landowner		Terry Vaculchik				As	6.60	15.17	0.144				
Legal Description		SE-21-55-24-4				Cd	3.50	8.04	0.077	9269	1500	8054	600
Start Date		27-Sep-21				Cr	181	415.9	3.96	179	20	156	8
End Date		8-Oct-21				Cu	327	751	7.16	99	15	86	6
Soil Class		Class 1				Pb	59.0	135.6	1.291	550	20	478	8
Biosolids Type		Digested				Mn	348	800	7.62				
		Gravity Thickened				Hg	1.48	3.401	0.032	21920	3000	19047	1100
						Ni	49	112.6	1.072	662	100	575	40
						Se	15.1	34.70	0.330				
						Zn	677	1556	14.8	48	10	42	4
						Co	10.20	23	0.2				

Substance Loading Rates on Olstad turnkey Fields - 2021

Olstad Field OC-07					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	ha	Tonnes/ha	Substance	mg/Kg	Kg	Kg/ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
24711	6.77%	1672	188	76	22.0	TP	28190	47134	620				
						TN	32442	54243	714				
						NH4-N	16325	27295	359				
Landowner		John Vaculchik				As	6.60	11.04	0.145				
Legal Description		NW-21-55-21-4				Cd	3.50	5.85	0.077	9269	1500	8054	600
Start Date		12-Oct-21				Cr	181	302.6	3.98	179	20	156	8
End Date		21-Oct-21				Cu	327	547	7.19	99	15	86	6
Soil Class		Class 1				Pb	59.0	98.6	1.298	550	20	478	8
Biosolids Type		Digested				Mn	348	582	7.66				
		Gravity Thickened				Hg	1.48	2.475	0.033	21920	3000	19047	1100
						Ni	49	81.9	1.078	662	100	575	40
						Se	15.1	25.25	0.332				
						Zn	677	1132	14.9	48	10	42	4
						Co	10.20	17	0.2				

Appendix J – Non-Ag Biosolids Management Report

EPCOR Water Services Inc.

2021 Biosolids Land Application Management Report

December 2021

Prepared for:

EPCOR Water Services Inc.
9504 49 St NW
Edmonton, AB
Canada, T6B 2M9

Prepared by:

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SYLVIS DOCUMENT #1454-21

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SYLVIS

EXECUTIVE SUMMARY

This report summarizes the 2021 non-agricultural biosolids management program conducted by SYLVIS Environmental Services Inc. for EPCOR Water Services Inc. at the Paintearth Coal Mine and the former Diplomat Mine.

SYLVIS managed a total of 6,527 dry tonnes (dt) of biosolids in 2021. 513 dt of biosolids overwintered from the 2020 program were applied in May 2021, and 6,014 dt of biosolids were hauled by the program between June and October 2021. All biosolids were applied and incorporated by October 18, 2021, to 272 ha of land.

LIST OF ABBREVIATIONS

General abbreviations used in this document:

AB – Alberta
AEP – Alberta Environment and Parks
AER – Alberta Energy Regulator
E – East
EWMC – Edmonton Waste Management Centre
N – Nitrogen
NE – Northeast
P – Phosphorus
S – South
TE – Trace element

Unit abbreviations used in this document:

dt – dry tonne
ha – hectare
kg – kilogram
km – kilometre
m – metre
mg – milligram
t – tonne

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APPENDIX TWO – FIGURES

1 PROJECT OVERVIEW

Project Name: BIOSALIX

Alberta Energy Regulator (AER) Approval/Reference Number: Environmental Protection and Enhancement Act (EPEA) Approval #00011364-03-00, as amended (February 2019)

Notification Submission Dates: 02-07-2021, 20-07-2021, 15-07-2021, 23-04-2021, 25-08-2021 (in 2021)

Project Start Date: April 1, 2019

Project End Date: October 18, 2021

Biosolids Type: Anaerobically digested, dewatered

Total Solids Content (%): Average 23.9%

Target Biosolids Utilization – Dry Tonnes (dt): 6,000 dt (in 2021)

Actual Biosolids Utilization (dt): 6,014 dt were received between May 31 and October 15, 2021. Combined with 513 dt of biosolids overwintered from 2020, 6,527 dt were applied to 272 ha of land within the Paintearth Mine and former Diplomat Mine sites in 2021. At the end of the 2021 field season, all biosolids delivered to the land application sites were applied. There are no biosolids stockpiled for 2022 applications.

2 PROJECT TYPE

- ☐ Agricultural (Thickened) – Nutri Gold
- ☐ Agricultural (Dewatered)
- ☒ Mine Reclamation
- ☐ Marginal Land Improvement
- ☐ Biomass Plantation Establishment
- ☐ Off-spec Agricultural Land (i.e., outside the purview of the guidelines)
- ☐ Other (please specify below)

3 REGULATORY ADMINISTRATION

- ☒ Guideline
- ☐ Letter of No Objection
- ☒ Other (please specify below)

  AER Authorization for applications outside the context of current regulatory guidance.

	Modified Alberta Environment and Park (AEP) notifications including assessment of trace elements/metals against Alberta Tier 1 Soil and Groundwater Remediation Guidelines.
EPEA Approval Number:	00011364-03-00, As Amended (February 2019)

4 CONTACTS

EPCOR (Owner / Biosolids Generator)

Name: David Curran
Address: 9504 49 St NW, Edmonton AB, T6B 2M9
Phone: 780-718-2126
Email: dcurran@epcor.ca

Contractor and Qualified Professional: SYLVIS Environmental

Name: Kasia Caputa
Address: Suite 301, 10171 Saskatchewan Dr NW, Edmonton, AB, T6E 4R5
Phone: 780-932-6135
Email: kcaputa@sylvis.com
Core Responsibilities: Regulatory approval, demonstration project design, environmental monitoring, reporting, transportation supervision, stockpiling, and land application supervision

Subcontractor: Whiterock Ventures

Name: Kal Kingra
Address: 2235 76 Ave, Edmonton, AB, T6P 1P6
Phone: 780-469-0819
Email: kal@whiterockventures.ca
Core Responsibilities: Biosolids transportation

Landowner / Leaser: Westmoreland Mining LLC, Prairie Mines and Royalty ULC, Paintearth Coal Mine

Name: Mark Matthews
Address: 1100-10123 99 Street NW, Edmonton, AB
Phone: 780-420-5896
Email: mmatthews@westmoreland.com

Regional Regulatory Liaison

Name: Fengqin Wang
Agency: AEP
Address: 111 Twin Atria Building, 4999-98 Ave, Edmonton AB, T6B 2X3
Email: fengqin.wang@gov.ab.ca.

5 APPLICATION AREAS

Name: Paintearth Coal Mine

Physical Address: Highway 855, near Township Rd. 403, Paintearth County, AB

Application Sites:

The 2021 biosolids application sites are described in Table 1, Appendix One – Tables

Truck Route Description from Edmonton Waste Management Centre (EWMC) (distances estimated):

Exit EWMC, turn right onto Aurum Road NE; Take the ramp and merge onto AB-216, head south on AB-216 for 17.3 km; Exit onto AB-14 E and continue for 77.6 km; Turn right onto AB-855 S, follow AB-855 S for 91.8 km; Turn right on AB-601, follow AB-601 for 1.6 km; Turn left to enter Paintearth Coal Mine

Distance from EWMC: 188 km

Vegetation prior to biosolids application:

Pasture grasses, annual crops, or unvegetated with freshly placed topsoil

Vegetation following biosolids applications for next three growing seasons:

Hybrid coppice willow plantation, cereal crops, and mixed reclamation grasses

Name: Former Diplomat Mine

Physical Address: Highway 855 and Township Rd 411, Flagstaff County, AB

Application Sites:

The application sites are on agricultural land located within the former Forestburg Collieries Ltd. Diplomat Mine. The 2021 biosolids delivery and application sites are described in Table 1, Appendix One – Tables

Truck Route Description from EWMC (distances estimated):

Exit EWMC, turn right onto Aurum Road NE; Take the ramp and merge unto AB-216, head south on AB-216 for 17.3 km; Exit onto AB-14 E and continue for 77.5 km; Turn right onto AB-855 S, follow AB-855 S for 84.7 km, turn left into site NW01/NE01. For access to site N31, continue on AB-855-S for 0.5 km, turn left on TWP 410, follow TWP 410 for 2.4 km; Turn right to enter site.

Distance from EWMC: 181 – 184 km

Vegetation prior to biosolids application: Pasture grasses and cereal crops

Vegetation following biosolids applications for next three growing seasons:

Pasture grasses for non-dairy cattle and cereal crops

6 SUPPORTING DOCUMENTATION

Road Use Agreement:

Site: Paintearth Coal Mine

Issuing county: County of Paintearth No. 18

Contact: Colm Fitz-Gerald, Community Peace Officer, 403-740-2997

Route: Township Road 404 to mine property

Road bans (if applicable): Not applicable for the hauling period

Value of bond posted: Not applicable

Agreement Date: Effective on June 8, 2020, and expires on November 30, 2022

Post-project inspection completion date:

A post-haul inspection may be conducted at the County's sole discretion. The County shall notify SYLVIS of the date and time of the inspection

Site: Former Diplomat Mine

Issuing county: Flagstaff County

Contact: Roadata Services Ltd, 1-888-444-9288

Route: Township Road 410 from Highway 855 to Range Road 155

Road bans (if applicable): Not applicable for the hauling period

Value of bond posted: Not applicable

Agreement Date: Effective on August 14, 2021, and expires on September 11, 2021

Post-project inspection completion date:

The County will conduct a post-haul inspection to assess road conditions. A SYLVIS employee may be present at the inspection upon SYLVIS' request

7 SITE MAPS

Figure 1, Appendix Two – Figures provides an overview of all biosolids application areas at Paintearth Mine from 2019 to 2021

Figure 2, Appendix Two – Figures provides an overview of all biosolids application areas at the former Diplomat Mine in 2021

8 HISTORIC BIOSOLIDS APPLICATIONS

One site at the Paintearth Mine (West Pit Subsoil) received biosolids in 2020 in accordance with the AER Authorization. All other sites applied in 2021 have not previously received biosolids.

9 QUALITY ASSURANCE

SYLVIS completed due diligence for biosolids quality assurance by reviewing laboratory results from April through October 2021. Comparison of average concentrations to current regulatory criteria for biosolids quality and land application loading rates is provided in Table 2 and Table 3, Appendix One – Tables.

10 CURRENT PROJECT APPLICATION RATES AND METHODOLOGY

Biosolids Type: Anaerobically digested, dewatered

Biosolids stockpiled? Yes

Stockpile Duration: June – October 2021

Application Method: Surface application with rear-discharge manure spreaders and incorporation with agricultural tillage equipment.

For the subsoil blend and extend authorization in Section 16/17 at Paintearth Coal Mine, biosolids were co-applied to subsoil with wood chips and overburden to create a subsoil blend. Approximately 30% of the feedstock blending was completed in windrows, where feedstocks were mixed with a front-end loader and spread with a bulldozer. The remaining blending was completed by applying feedstocks to the target area in lifts to a combined depth 0.36 m, alternating biosolids and wood chips. All amendments applied from windrows and lifts were incorporated using agricultural tillage equipment.

Application rate: Included in Table 1, Appendix One - Tables by application area.

Have other amendments (e.g., lime) been co-applied? If so, specify material and application rate: Wood chips were co-applied in the Section 16/17 subsoil blend and extend. Applications were completed in three different treatment areas. Volume ratios (biosolids: wood chips: subsoil) are as follows:

- Area 1 (bucket mixed windrows) – 1: 1.5: 5
- Area 2a (in situ placement and mixing) – 1: 1.2: 5
- Area 2b (in situ placement and mixing) – 1: 1.1: 5.5

11 POST APPLICATION MONITORING

Required? Post-application monitoring is required as per the AER Authorizations (16/17 Subsoil Blend and Extend, West Pit Subsoil).

Matrix (e.g., soil, crop, surface waste): Soil and vegetation.

Constituents: Nutrients, salinity, trace elements.

Frequency and duration: As specified in the respective authorization monitoring plans.

Application of results: Soil and surface water monitoring reports will be provided to AER at the end of the required monitoring period for each authorization area.

12 PROJECT CHALLENGES

Provided below is a summary of challenges experienced during the project and actions to improve project execution.

Challenge 1 – Disconnect Between Requested Schedule and Feasible Biosolids Availability

The hauling schedule agreed upon between EPCOR, SYLVIS, and the dewatering plant was for 10 loads a day (approximately 87.8 dt) from Monday through Saturday. When dewatering issues were encountered (refer to Challenge 2), it was clarified that the requested haul schedule required the dewatering facility operating at 100% efficiency while 80-85% efficiency is a more reasonable expectation. Short- and long-term options to consider for addressing this disconnect going forward were discussed at a mid-season touch-point and end-of-season debrief. To date, there has been no firm resolution for this challenge.

Challenge 2 – Inconsistent Biosolids Availability

Ongoing technical dewatering issues impacted biosolids availability for the duration of the 2021 hauling season, which extended the anticipated hauling schedule by almost eight weeks. Other challenges related to the dewatering plant included short-notice deviations to daily hauling cycles, long loading times, and under-loaded trucks. A summary of the hauling schedule for 2021 hauling season is provided in Figure 3, Appendix Two – Figures, and in Table 4, Appendix One – Tables.

SYLVIS and the dewatering plant implemented the following changes in communication in response to the challenges:

- The 15:30 h call time for cancellation or deviations to the schedule on a day-to-day basis was extended to 16:00 h and adhered to for the remainder of the season.
- The hauling contractor committed to providing immediate notice regarding long loading times (> 1 hour from gate-to-gate) or underweight loads (< 35 tonnes) to facilitate alerting the dewatering facility to issues and reassessing the daily hauling plan.
- A dedicated technician was assigned to the dewatering facility to identify and address issues.

APPENDIX ONE – TABLES

Table 1: Biosolids application site details for 2021.

Site Name	Application Type / Site Classification	Target Application Rate(dt/ha)	Application Area (ha)	Biosolids Applied (dt)	Legal Description	Biosolids Application Dates
Paintearth Mine						
Section 17 (LU1)	Topsoil Amendment - Class 1	19	8	154	SW 20-40-15-W4M	May 4 – 7, 2021
Section 17E (LU1)	Topsoil Amendment - Class 1	19	16	218	NE/SE 17-40-15-W4M	May 11 – 20, 2021
West Pit (LU6)	Subsoil Application	50	3.2	141	NE 15-40-16-W4M	May 7, May 20-28, 2021
North Block	Topsoil Amendment - Class 1	22	35.6	888	NE/NW/SE/SW 26-40-16-W4M and NE/SE 27-40-16W4M	October 6 – 13, 2021
Section 17E	Topsoil Amendment - Class 1	22	88.8	1,908	LSD 9, 10, 15 and 16 of 17-40-15W4M LSD 1, 2, and 3 of 20-40-15W4M	September 20 – October 6, 2021
Section 16/17	Subsoil Blend and Extend	108	6.4	685	SE/SW 16-40-15-W4M and SE/SW 17-40-15-W4M	August 12 – October 18, 2021
West Pit (LU3 and 4)	Subsoil Application – 2nd Year Top-Up	25	7.8	191	SE 22-40-16-W4M and NE 15-40-16-W4M	September 7-10, 2021
Former Diplomat Mine						
NW01	Class 1	22	13.9	307	NW 01-41-16-W4M	September – October 2021
NE01	Class 1	22	33.7	742	LSD 9,10, 15, and 16 of 01-41-16-W4M	September 2021
N31	Class 1	22	58.8	1,293	NE/NW 31-40-15-W4M	October 2021

Table 2: Trace element (TE) and nutrient concentrations and minimum acceptable ratios of nitrogen (N) and phosphorus (P) to trace elements.

Parameters	Concentration[(a)] (mg/kg)	N/TE	Guideline N/TE Minimum Ratio[(b)]	P/TE	Guideline P/TE Minimum Ratio[(b)]
Trace Elements					
Cadmium	2.75	15,191	1,500	9,313	600
Chromium	67.0	623	20	382	8
Copper	454	92	15	56	6
Lead	33.0	1,266	20	776	8
Mercury	1.07	38,981	3,000	23,897	1,100
Nickel	33.1	1,260	100	773	40
Zinc	783	53	10	33	4
Nutrients					
Total Nitrogen	41,710	-	-	-	-
Total Phosphorous	25,570	-	-	-	-

[(a)] Concentrations are the arithmetic mean of data from the Quality Assurance Laboratory for Gold Bar for the months of April through October in 2021, reported in EPCOR lab reports 202105030030, 202106040042, 202106180012, 202107270039, 202108250022, 20210010031, and 202111020014.

[(b)] Minimum ratios as specified in the *Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands* (2001).

Table 3: Trace element and nutrient loading rates based on the maximum biosolids application rate of 22 dt/ha for Class 1 Topsoil Amendment Sites.

Parameters	Biosolids Concentration[b]	Loading Rate (kg/ha)	Guideline Limit[a]	% Of Guideline Limit	Units
Trace Elements					
Arsenic	4.8	0.11	-		mg/kg
Cadmium	2.75	0.06	1.5	3.8	mg/kg
Chromium	67.0	1.41	100	1.4	mg/kg
Copper	454	10.0	200	4.8	mg/kg
Lead	33.0	0.73	100	0.7	mg/kg
Mercury	1.07	0.02	0.5	4.5	mg/kg
Nickel	33.1	0.73	25	2.8	mg/kg
Selenium	5.3	0.12	-		mg/kg
Zinc	783	17.2	300	5.3	mg/kg
Fertility Parameters					
Total Phosphorous	25,570	563	-	-	mg/kg
Total Nitrogen	41,710	918	-	-	mg/kg

[a] Maximum Cumulative Additions to Class 1 Sites for a single application from the *Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Land* (2001). Where values are not provided, there is no applicable guideline

[b] Concentrations are the arithmetic mean of data from the Quality Assurance Laboratory for Gold Bar for the months of April through October in 2021. EPCOR lab reports 202105030030, 202106040042, 202106180012, 202107270039, 202108250022, 20210010031, and 202111020014.

Table 4: Documentation of daily biosolids transfers to the project sites for the 2021 hauling season.

Date	Target Biosolids Tonnage (dt)	Actual Biosolids Tonnage (dt)	Running Total (dt)	Daily Variance (dt)	Reason for Significant Variances (< 80% of daily target)
May 31	17.56	18.77	18.77	1.21	
June 1	87.79	61.42	80.19	-26.37	Hauling contractor had one truck in for maintenance work.
June 2 – 5	351.16	0.00	80.19	-351.16	Equipment issues at dewatering plant.
June 6	0.00	18.23	98.42	18.23	
June 7 – 8	175.58	125.05	223.47	-50.53	Miscommunication with hauling contractor.
June 9 – 10	175.58	79.96	303.43	-95.62	Equipment issues at dewatering plant.
June 11	87.79	81.54	384.97	-6.25	
June 12	87.79	77.96	462.93	-9.83	
June 13	0.000	27.26	490.18	27.26	
June 14	87.79	80.62	570.80	-7.17	
June 15	87.79	74.29	645.09	-13.5	
June 16 – 26	877.90	278.18	923.27	-599.72	Equipment issues at dewatering plant.
June 27	0.00	0.00	923.27	0.00	
June 28	87.79	53.71	976.98	-34.08	Dewatering plant running under capacity and limited drivers available for the day.
June 29	87.79	89.53	1,066.51	1.74	
June 30	87.79	63.76	1,130.28	-24.03	
July 1	0.00	17.78	1,148.06	17.78	
July 2	87.79	86.36	1,234.41	-1.43	
July 3	87.79	69.37	1,303.78	-18.42	

Table 4 (cont'd): Documentation of daily biosolids transfers to the project sites for the 2021 hauling season.

Date	Target Biosolids Tonnage (dt)	Actual Biosolids Tonnage (dt)	Running Total (dt)	Daily Variance (dt)	Reason for Significant Variances (< 80% of daily target)
July 4	0.00	17.66	1,321.44	17.66	
July 5	87.79	98.84	1,420.28	11.05	
July 6	87.79	91.92	1,512.20	4.13	
July 7 – 8	175.58	69.74	1,581.94	-105.84	Sludge quality issues at dewatering plant.
July 9	87.79	96.42	1,678.36	8.63	
July 10	87.79	77.54	1,755.90	-10.25	
July 11	0.00	0.00	1,755.90	0.00	
July 12	87.79	98.16	1,854.06	10.37	
July 13	87.79	34.92	1,888.97	-52.87	Dredge issues at dewatering plant.
July 14	87.79	97.85	1,986.83	10.06	
July 15	87.79	89.94	2,076.77	2.15	
July 16	87.79	89.65	2,166.42	1.86	
July 17	87.79	71.19	2,237.61	-16.60	
July 18	0.00	0.00	2,237.61	0.00	
July 19	87.79	98.08	2,335.69	10.29	
July 20	87.79	92.29	2,427.98	4.50	
July 21	87.79	66.34	2,494.32	-21.45	
July 22	87.79	90.72	2,585.04	2.93	
July 23	87.79	51.96	2,637.01	-35.83	Polymer issues at dewatering plant.
July 24	87.79	79.77	2,716.78	-8.02	
July 25	0.00	17.77	2,734.55	17.77	
July 26 – 31	526.74	184.91	2,919.47	-341.83	Equipment issues at dewatering plant. Weather conditions caused longer unload times on site July 26.

Table 4 (cont'd): Documentation of daily biosolids transfers to the project sites for the 2021 hauling season.

Date	Target Biosolids Tonnage (dt)	Actual Biosolids Tonnage (dt)	Running Total (dt)	Daily Variance (dt)	Reason for Significant Variances (< 80% of daily target)
August 1	0.00	0.00	2,919.47	0.00	
August 2	0.00	0.00	2,919.47	0.00	
August 3	87.79	104.71	3,024.17	16.92	
August 4 – 18	1,141.27	432.89	3,457.06	-708.38	Equipment issues at dewatering plant.
August 19	87.79	88.49	3,545.55	0.70	Hauling contractor had one driver away for the morning. Miscommunication regarding intended number of loads for the day.
August 20	87.79	91.21	3,636.76	3.42	Dewatering plant recovering capacity from pump issues.
August 21[a]	0.00	73.98	3,710.74	73.98	
August 22	0.00	18.25	3,728.99	18.25	Pump and dredge issues at dewatering plant.
August 23 – September 4	0.00	235.92	3,964.91	235.92	Pump and dredge issues at dewatering plant.
September 5	0.00	0.00	3,964.91	0.00	Pump and dredge issues at dewatering plant.
September 6	0.00	18.05	3,982.95	18.05	Pump and dredge issues at dewatering plant.
September 7	0.00	69.78	4,052.74	69.78	Pump and dredge issues at dewatering plant.
September 8	0.00	90.99	4,143.73	90.99	
September 9	0.00	89.58	4,233.31	89.58	
September 10	0.00	87.58	4,320.88	87.58	
September 11	0.00	69.82	4,390.70	69.82	Pump and dredge issues at dewatering plant.
September 12	0.00	17.13	4,407.84	17.13	Pump and dredge issues at dewatering plant.
September 13	0.00	89.54	4,497.38	89.54	
September 14	0.00	87.67	4,585.05	87.67	
September 15 – 18	0.00	115.57	4,700.62	115.57	Pump issues at dewatering plant. Haul truck also broke down – further limit to loads delivered on September 18.

[a] The Target Biosolids Tonnage (dt) accumulated to 6000 dt by August 21, 2021. All values for target tonnage from August 21 – October 12, 2021, are left at zero to reflect this target accumulation

Table 4 (cont'd): Documentation of daily biosolids transfers to the project site.

Date	Target Biosolids Tonnage (dt)	Actual Biosolids Tonnage (dt)	Running Total (dt)	Daily Variance (dt)	Reason for Significant Variances (< 80% of daily target)
September 19	0.00	0.00	4,700.62	0.00	
September 20	0.00	91.59	4,792.22	91.59	
September 21	0.00	91.38	4,883.60	91.38	
September 22	0.00	90.75	4,974.35	90.75	
September 23 – 25	0.00	179.78	5,154.13	179.78	Pump and dredge issues at dewatering plant.
September 26	0.00	0.00	5,154.13	0.00	
September 27	0.00	98.62	5,252.75	98.62	
September 28	0.00	91.18	5,343.93	91.18	
September 29	0.00	70.53	5,414.46	70.53	
September 30 – October 1	0.00	164.02	5,578.48	164.02	Dewatering plant had limited material available due to slowed rates of production.
October 2	0.00	71.90	5,650.37	71.90	
October 3	0.00	0.00	5,650.37	0.00	
October 4 – 9	0.00	51.80	5,702.17	51.80	Pump issues at dewatering plant.
October 10	0.00	0.00	5,702.17	0.00	Pump issues at dewatering plant.
October 11	0.00	27.41	5,729.59	27.41	Pump issues at dewatering plant.
October 12	0.00	89.14	5,818.72	89.14	
October 13	0.00	80.76	5,899.48	80.76	
October 14	0.00	71.25	5,970.73	71.25	Hauling contractor had a truck broken, only four drivers available for the day.
October 15	0.00	43.81	6,014.54	43.81	Last day of hauling. Only five loads required on site.

APPENDIX TWO – FIGURES

Figure 1: Overview map of application areas for biosolids delivered to the Biosalix project – Paintearth Mine site from 2019 to 2021.

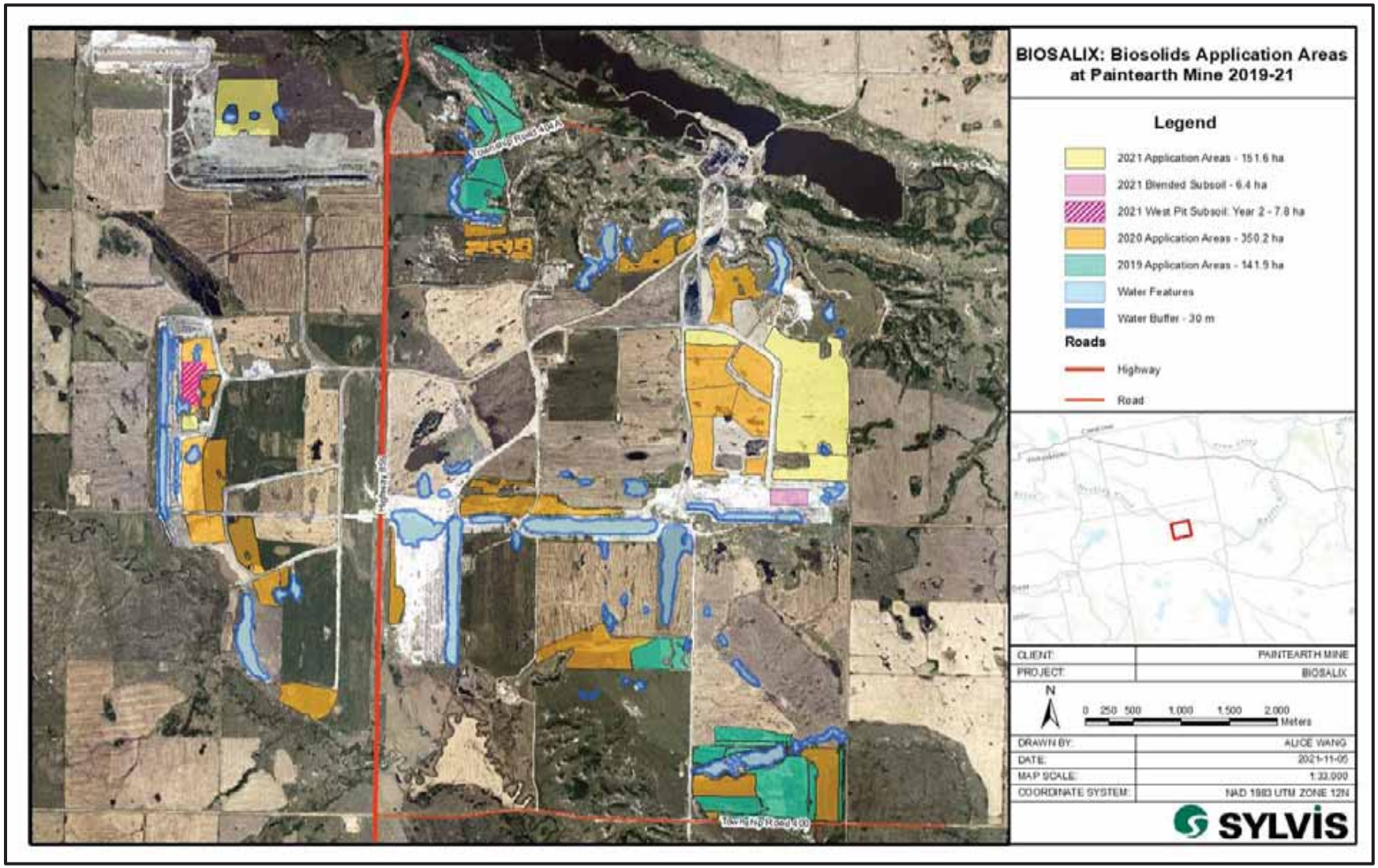

Figure 2: Overview map of application areas for biosolids delivered to the former Diplomat Mine site in 2021.

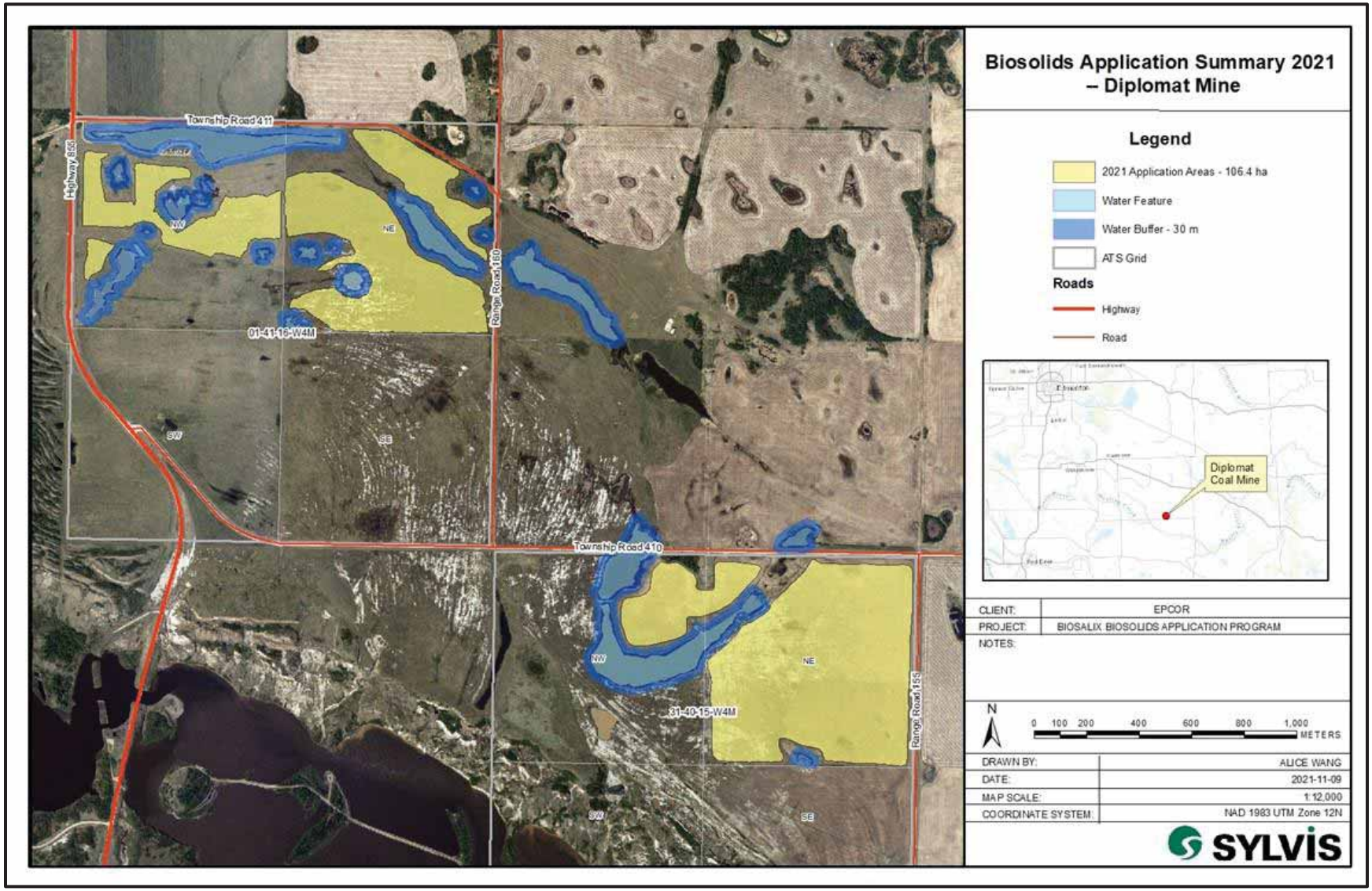

Figure 3: Cumulative targeted versus actual dry tonnage (dt) of biosolids hauled from May 31 to October 15, 2021.