TOWN OF OKOTOKS

WASTEWATER SYSTEM

2019 ANNUAL REPORT

Approval # 1028-03-00

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1. Wastewater System Introduction

EPCOR and the Town of Okotoks entered into an agreement to operate and maintain the wastewater system in Okotoks which commenced as of June 1st, 2005 till November 25th, 2019. As of November 25th at 12:00 pm the contract was terminated between the two organizations and the Town of Okotoks took back all control of the utilities. The current wastewater treatment facility is a Level IV Tertiary BNR (biological nutrient removal) treatment process with continuous discharge to the Sheep River.

2. Town of Okotoks Quality Assurance Program

The Town of Okotoks Water Services Quality Assurance Program for the site is intended to be part of a larger overall Quality Management System which ensures that the utility:

- can demonstrate that it can consistently meet regulatory requirements
- can demonstrate that it can meet internal operational requirements
- can enhance customer protection through effective application of a quality system
- Continuously improves the overall quality system.

The Town of Okotoks QA program is in place to ensure that water and wastewater quality data is reliable and technically (and legally) defensible, data is reported correctly, violations are reported in a timely manner, approval requirements are met, and water or wastewater quality problems are responded to effectively. For external and internal audit purposes the Town of Okotoks must be also be able to demonstrate that:

- it is doing what it says it is doing in all of its operations and it is has the documentation to back this claim up,
- data, and procedures for generating data, are verified by a qualified group that is independent of operations, and
- It is exercising due diligence by requiring that a reasonable level of quality assurance is in place at all external sites, and not only at the Edmonton operations.
- Has identified risks to the utility and has prepared remedial action plans for improvements.

3. Summary of WWTP Untreated Wastewater Influent: Monthly Summaries; BOD/TSS/Volume; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : BOD_5 - TSS - VOLUME												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
BOD_5	mg/L	Once per day	Composite	Entering WWTP	MIN	320	334	342	347	344	310	329
					MAX	708	540	560	596	614	602	731
					AVG	448	435	421	452	449	437	439
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	268	276	252	284	264	236	252
					MAX	360	368	396	404	532	344	792
					AVG	320	319	324	342	337	299	321
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	5766	5932	6000	5682	5924	6054	5966
					MAX	7061	7290	7190	6983	7180	7021	7546
					AVG	6302	6424	6490	6139	6408	6517	6513
					TOTAL	**195371**	**179883**	**201203**	**184179**	**198658**	**195511**	**201918**
BOD5 - Biochemical Oxygen Demand **TSS - Total Suspended Solids**												

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : BOD_5 - TSS - VOLUME											
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
BOD_5	mg/L	Once per day	Composite	Entering WWTP	MIN	306	213	336	345	354	**213**
					MAX	703	600	570	557	492	**731**
					AVG	427	405	405	404	415	**428**
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	220	240	232	112	288	**112**
					MAX	1168	412	368	376	396	**1168**
					AVG	342	320	303	317	328	**323**
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	5382	5953	6265	6199	6371	**5382**
					MAX	6463	7328	7600	7844	7306	**7844**
					AVG	5964	6493	6755	6772	6660	**6453**
					TOTAL	**184870**	**194795**	**209404**	**203166**	**206454**	**2355412**
BOD5 - Biochemical Oxygen Demand **TSS - Total Suspended Solids**											

NOTE: High TSS values entering the plant July 31st and August 1st were due to sewer line flushing in the area.

4. Summary of WWTP Untreated Wastewater Influent: Monthly Summaries; Ammonia/Total Phosphorus; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : AMMONIA - TOTAL PHOSPHORUS												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Ammonia - Nitrogen	mg/L	Once per week	Composite	Entering WWTP	MIN	36.6	39.7	31.1	34.0	32.8	30.9	20.2
					MAX	43.8	41.6	41.6	42.7	42.0	39.5	37.9
					AVG	40.1	41.0	35.6	38.6	37.9	35.2	29.2
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	5.90	5.90	3.50	6.70	6.50	6.20	5.40
					MAX	10.75	8.50	8.45	9.10	8.30	8.20	9.40
					AVG	7.05	7.08	6.75	7.38	7.24	6.96	6.54

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : AMMONIA - TOTAL PHOSPHORUS											
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Ammonia - Nitrogen	mg/L	Once per week	Composite	Entering WWTP	MIN	34.9	28.9	32.6	31.9	29.6	**20.2**
					MAX	39.9	38.9	40.4	38.0	45.5	**45.5**
					AVG	37.5	35.0	36.5	35.6	35.3	**36.5**
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	6.40	4.80	6.00	6.30	6.10	**3.50**
					MAX	10.90	10.40	9.50	7.80	7.80	**10.90**
					AVG	7.27	6.82	6.85	6.80	6.97	**6.98**

5. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; BOD/CBOD/TSS/Volume; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: BOD_5 - $CBOD_5$ - TSS - VOLUME													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
BOD_5 MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	3.2	2.8	3.5	2.0	< 2.0	2.5	2.8
						MAX	9.5	6.9	12.2	15.3	7.4	9.0	6.1
						AVG	6.1	5.0	8.3	7.3	4.5	4.9	4.0
$CBOD_5$ MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 20 mg/L	MIN	2.4	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
						MAX	4.5	3.5	3.8	2.3	2.2	2.8	6.7
						AVG	3.3	2.6	2.6	2.0	2.0	2.1	2.3
TSS MDL : 2.5 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 15 mg/L	MIN	< 2.5	< 2.5	2.5	< 2.5	< 2.5	< 2.5	< 2.5
						MAX	5.0	3.5	4.7	3.3	< 2.5	3.3	2.9
						AVG	3.3	2.5	3.4	2.6	< 2.5	2.7	2.5
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	5493	5562	5698	5401	5714	5886	5851
						MAX	6447	6550	6795	6623	6840	6923	7474
						AVG	5894	5905	6134	5829	6154	6286	6422
						TOTAL	**182704**	**165333**	**190141**	**174869**	**190789**	**188587**	**199085**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids
< TSS Estimate : Less than 2.5 mg was retained on the filter

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: BOD_5 - $CBOD_5$ - TSS - VOLUME												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
BOD_5 MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	2.0	3.6	3.8	< **2.0**
						MAX	6.0	8.7	10.1	11.0	13.1	**15.3**
						AVG	3.1	3.8	5.2	7.4	8.4	**5.7**
$CBOD_5$ MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 20 mg/L	MIN	< 2.0	< 2.0	< 2.0	2.0	2.0	< **2.0**
						MAX	2.0	2.5	8.0	10.0	5.3	**10.0**
						AVG	2.0	2.1	2.4	2.9	3.2	**2.5**
TSS MDL : 2.5 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 15 mg/L	MIN	< 2.5	< 2.5	< 2.5	2.5	3.3	< **2.5**
						MAX	2.5	< 2.5	3.4	6.1	9.6	**9.6**
						AVG	2.5	< 2.5	2.6	3.4	4.6	**2.9**
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	5329	5955	6271	6034	6198	**5329**
						MAX	6436	7239	7586	7234	7089	**7586**
						AVG	5924	6496	6763	6518	6473	**6233**
						TOTAL	**183629**	**194873**	**209642**	**195543**	**200659**	**2275854**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids

< TSS Estimate : Less than 2.5 mg was retained on the filter

6. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; Ammonia/Total Phosphorus/Acute Lethality; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: AMMONIA - TOTAL PHOSPHORUS - ACUTE LETHALITY													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Ammonia - Nitrogen MDL : 0.50 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L Jul 1 - Sep 30 ≤ 5mg/L	MIN	< 0.50	1.27	1.02	< 0.50	< 0.50	0.50	< 0.50
						MAX	2.40	10.00	9.62	4.83	3.34	1.09	1.70
						AVG	0.88	5.37	3.9	2.3	0.8	0.5	0.57
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.05	0.13	0.22	0.15	0.09	0.17	0.17
						MAX	0.31	0.22	0.41	0.28	0.30	0.32	0.30
						AVG	0.25	0.18	0.31	0.20	0.16	0.25	0.21
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A			% 0			% 0		

NOTE: All samples tested for Acute Lethality in 2019 are reported as **0 %** (Not Acutely Lethal).

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: AMMONIA - TOTAL PHOSPHORUS - ACUTE LETHALITY												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Ammonia - Nitrogen MDL : 0.50 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L Jul 1 - Sep 30 ≤ 5mg/L	MIN	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< **0.50**
						MAX	< 0.50	1.90	< 0.50	0.74	1.10	**10.00**
						AVG	< 0.50	0.59	< 0.50	0.5	0.6	**1.4**
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.10	0.12	0.10	0.04	0.13	**0.04**
						MAX	0.22	0.51	0.32	0.22	0.42	**0.51**
						AVG	0.17	0.20	0.18	0.17	0.24	**0.21**
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A		% 0			% 0		**AVG** % **0**

NOTE: All samples tested for Acute Lethality in 2019 are reported as **0 %** (Not Acutely Lethal).

7. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; Nitrogen Analysis; Approval 1028-03-00;

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: NITROGEN : TKN - NO_2 NO_3 - TN													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
TKN MDL : 0.07 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	2.10	3.75	3.38	1.80	1.20	0.36	< 0.07
						MAX	2.70	8.10	6.40	4.07	2.30	2.50	3.20
						AVG	2.34	6.79	4.45	3.09	1.79	1.23	1.51
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	4.31	2.60	2.48	4.16	4.56	5.10	4.10
						MAX	6.18	5.30	3.53	4.56	5.08	5.64	5.50
						AVG	5.37	3.85	2.87	4.38	4.83	5.38	5.17
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	6.41	8.21	5.86	5.96	6.06	5.86	5.49
						MAX	8.38	13.40	9.34	8.55	7.38	8.14	7.30
						AVG	7.71	10.64	7.31	7.47	6.62	6.61	6.39

TKN - Total Kjeldahl Nitrogen
NO_2 - NO_3 - Nitrite and Nitrate Nitrogen
TN - Total Nitrogen

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Treated Wastewater: NITROGEN : TKN - NO_2 NO_3 - TN												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
TKN MDL : 0.07 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	< 0.07	0.80	0.71	1.10	1.80	**<0.07**
						MAX	3.50	2.49	1.71	1.82	3.48	**8.10**
						AVG	1.20	1.80	1.39	1.51	2.53	**2.47**
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.16	4.84	5.05	5.13	3.88	**2.48**
						MAX	14.00	14.10	5.99	5.66	6.05	**14.10**
						AVG	11.37	11.56	5.59	5.48	5.09	**5.91**
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	6.08	7.33	6.36	6.70	6.23	**5.49**
						MAX	17.50	16.00	7.28	7.33	8.92	**17.50**
						AVG	12.56	13.36	6.98	6.99	7.62	**8.35**

TKN - Total Kjeldahl Nitrogen
NO_2 - NO_3 - Nitrite and Nitrate Nitrogen
TN - Total Nitrogen

8. Summary of WWTP Parameters: Total and Faecal Coliforms: Monthly Summaries; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: TOTAL & FAECAL COLIFORMS

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
Total Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 1000 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	> 8000	1500	900	136	145	230	118
						Geometric Mean	129	224	46	31	26	45	16
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 200 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	4200	210	191	30	50	55	45
						Geometric Mean	61	75	25	13	16	20	14

NOTE: Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: TOTAL & FAECAL COLIFORMS

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Total Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 1000 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	**< 10**
						MAX	45	36	550	10	109	**> 8000**
						Geometric Mean	23	16	29	10	19	**33**
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 200 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	**< 10**
						MAX	10	10	155	< 10	50	**4200**
						Geometric Mean	10	10	23	< 10	16	**19**

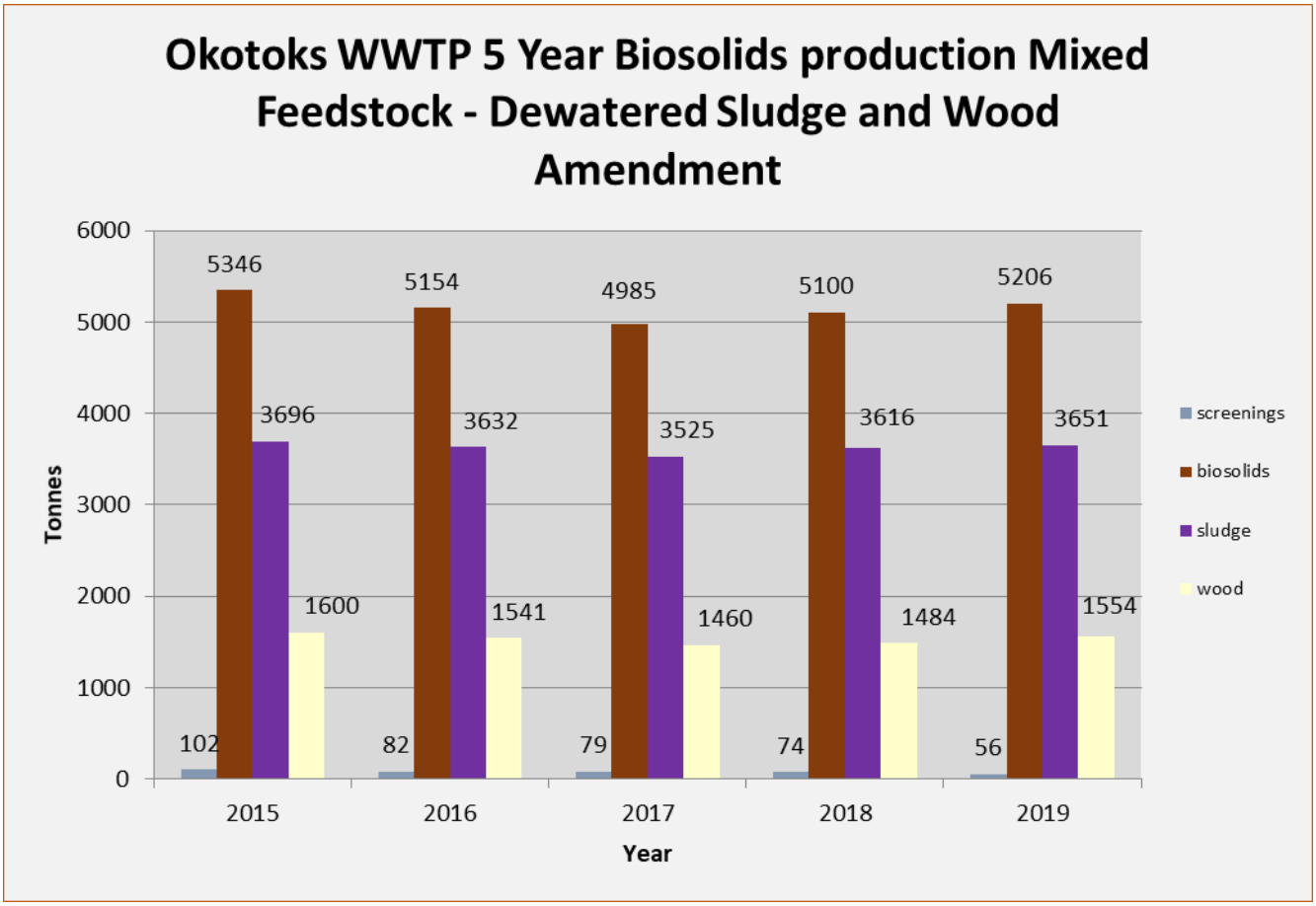
NOTE: Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.

9. Summary of WWTP Parameters: Sludge/Partially Composted Sludge: Monthly Summaries; Approval 1028-03-00; Table 6-1

EPCOR Water Services/Town of Okotoks - Wastewater Treatment Plant
2019 Annual Partially Composted Sludge Production MIN/MAX/AVG

	COMPOST FEEDSTOCK						SOLIDS SHIPPED FROM WWTP				
	Dewatered Sludge TOTAL	Dewatered Sludge MIN	Dewatered Sludge MAX	Wood Shavings Total	Wood Shavings MIN	Wood Shavings MAX	Mixed Feedstock to Regional Facility TOTAL	Mixed Feedstock to Regional Facility - MIN	Mixed Feedstock to Regional Facility - MAX	Raw Screenings to Regional Landfill TOTAL	General Notes
Month	**Metric Tonnes**						**Metric Tonnes**				1) Raw Screenings/Grit
JAN	333.6	8.2	16.7	138.6	3.4	6.7	472.2	11.8	23.4	5.0	hauled to landfill: kept separate
FEB	257.6	7.1	12.9	112.3	3.0	5.6	369.8	10.1	18.5	4.6	from Biosolids Compost.
MAR	339.9	7.9	14.0	144.2	3.4	6.7	484.1	11.4	19.8	4.8	
APR	325.5	7.9	13.1	137.9	3.1	5.5	463.3	11.3	18.6	3.9	2) All raw feedstock
MAY	318.8	7.6	14.3	135.6	3.3	5.9	454.4	11.0	20.2	4.7	(dewatered sludge & sawdust)
JUN	290.1	7.7	13.0	126.1	3.1	9.6	416.2	11.1	19.2	4.2	sent to approved regional compost
JUL	287.8	0.0	15.4	118.9	0.0	5.9	406.8	0.0	21.1	4.0	facility - EcoAg.
AUG	269.9	4.4	13.0	113.6	1.7	5.4	383.5	6.1	18.4	4.7	
SEP	271.7	4.4	13.5	113.8	1.8	5.4	385.5	6.2	18.6	6.0	3) Wood amendment supplied
OCT	319.5	0.0	15.9	133.1	0.0	7.4	452.6	0.0	22.9	5.0	by Spray Lakes Sawmills.
NOV	322.2	7.7	13.9	138.8	3.3	6.2	461.0	11.5	19.5	4.8	
DEC	314.8	0.0	17.0	141.5	0.0	7.6	456.3	0.0	24.6	4.5	
TOTAL	**3651.4**			**1554.3**			**5205.7**			**56.3**	
AVG	304.3			129.5			433.8			4.7	
MIN	257.6			112.3			369.8			3.9	
MAX	3651.4			144.2			484.1			6.0	***WAS: Waste Activated Sludge***

10. Chart – WWTP: Five Year Biosolids Production



11. Summary of Incidents Reported to AEP – 2019

There were no contravention to report for 2019.

12. Summary of Treated Wastewater used for Irrigation – 2019

There was no treated wastewater used for irrigation purposes in 2019.

13. WWTP Uncommitted Hydraulic Reserve Capacity – 2019-2023

Municipality	Town of Okotoks	**Facility**	Okotoks Wastewater Treatment Plant
Supervising Operator	James McElmon	**Phone No.**	(403) 899-9343
Treatment Type	Mechanical – Tertiary BNR	**Design Capacity (m3/d)**	10,000

	Year	**2019**	***2020**	***2021**	***2022**	***2023**
Average Daily Flow - 2019	m3/d	6,453	6,765	6,959	7,154	7,349
Average Daily Flow Per Capita (F)	m3/capita/d	0.221	0.225	0.225	0.225	0.225
Hydraulic Reserve Capacity (Cr)	m3/d	3,547	3,235	3,041	2,846	2,652
Number of Unconnected Approved Lots (L)	lots	600	400	400	400	400
Connected Population (P)	persons	29,200	30,065	30,930	31,795	32,660
Number of Residential Connections (H)	connections	10,734	11,135	11,456	11,776	12,096
Committed Reserve (Com)	m3/d	361	243	243	243	243
Uncommitted Reserve Capacity (Cu)	m3/d	3,186	2,992	2,798	2,603	2,409

Cr = Design Capacity – Average Daily Flow

Cu = Cr – [L*F*P/H]

2019 connected Population is based on Federal census data

*Years 2020-2023 are estimates only

Future Pop is based on 5 yr annual ual avg growth rate of 865

Future Unconnected Approved Lots based on 5 yr avg

Future Res Connections is based on 2.7 people per connection

14. Summary of Chemicals Used - 2019

Summary of Chemicals Used in 2019				
MONTH	Zetag 8190 Dry Polymer kg	ALUM kg	Sodium Hypochlorite 16% L	Sodium Sulfite - Dechlorination tablets Kg
Jan	594	0	0	0
Feb	492	0	0	0
Mar	613	0	0	0
Apr	591	0	20	1
May	604	0	40	2
Jun	621	0	0	0
Jul	511	0	0	0
Aug	401	0	0	0
Sep	450	0	0	0
Oct	455	0	40	2
Nov	449	0	20	1
Dec	453	0	0	0
TOTAL	**6234**	**0**	**120**	**6**

1 Dry Polymer used in Sludge Dewatering process

2 Sodium Hypochlorite used for cleaning Disk Filtration process (Not for Treatment)

3 Sodium Sulfite used for dechlorination after disk filter cleaning

4 Alum used for Chemical Phosphorus removal. (**No ALUM was used in 2019**)

15. Summary of WSER Testing – 2019

WSER Monitoring Requirements 2019 - Town of Okotoks WWTP							
Parameter							
Sample Type	24 Hour Composite						Grab
Parameter	CBOD		TSS		Total Ammonia		Acute Lethality
Environment Canada Limits / Date	< or >	< 25 mg/L	< or >	< 25 mg/L	< or >		<50%
8-Jan-19	<	4.0		3.0		0.36	***Feb 4/19***
22-Jan-19	<	4.0	<	2.0		0.71	0%
5-Feb-19	<	4.0		3.0		2.78	
19-Feb-19	<	4.0		3.0		5.91	
5-Mar-19	<	4.0		3.0		4.98	
19-Mar-19	<	4.0		3.0		5.91	
Q1 AVG	**<**	**4.0**		**2.8**		**3.44**	**0%**
Q1 MIN	**<**	**4.0**	**<**	**2.0**		**0.36**	**0%**
Q1 MAX	**<**	**4.0**		**3.0**		**5.91**	**0%**
2-Apr-19	<	4.0		20.0		2.72	***May 6/19***
16-Apr-19	<	4.0	<	2.0		2.44	0%
30-Apr-19	<	4.0	<	2.0		2.11	
14-May-19		4.0		12.0		0.24	
28-May-19	<	4.0		2.0		0.22	
11-Jun-19	<	4.0		3.0		0.11	
25-Jun-19	<	4.0		2.0		0.09	
Q2 AVG		**4.0**		**6.1**		**1.13**	**0%**
Q2 MIN	**<**	**4.0**	**<**	**2.0**		**0.09**	**0%**
Q2 MAX		**4.0**		**20.0**		**2.72**	**0%**
9-Jul-19	<	4.0	<	2.0		0.11	***Aug 6/19***
23-Jul-19	<	4.0		3.0		0.06	0%
5-Aug-19	<	4.0		21.0		0.09	
20-Aug-19	<	4.0		3.0		0.09	
3-Sep-19	<	4.0		3.0		0.05	
17-Sep-19	<	4.0		2.0		0.07	
Q3 AVG	**<**	**4.0**		**5.7**		**0.08**	**0%**
Q3 MIN	**<**	**4.0**	**<**	**2.0**		**0.05**	**0%**
Q3 MAX	**<**	**4.0**		**21.0**		**0.11**	**0%**
1-Oct-19	<	4.0		2.0		0.09	***Nov 5/19***
15-Oct-19	<	4.0		2.0		0.06	0%
29-Oct-19	<	4.0		3.0		0.09	
12-Nov-19	<	4.0		4.0		1.01	
26-Nov-19	<	14.8	<	3.3		0.17	
11-Dec-19		8.1		3.6		0.26	
23-Dec-19		7.9	<	4.0		1.01	
Q4 AVG		**6.7**		**3.1**		**0.38**	**0%**
Q4 MIN	**<**	**4.0**		**2.0**		**0.06**	**0%**
Q4 MAX	**<**	**14.8**		**4.0**		**1.01**	**0%**
Annual AVG		**4.7**		**4.4**		**1.26**	**0%**
Annual MIN	**<**	**4.0**	**<**	**2.0**		**0.05**	**0%**
Annual MAX	**<**	**14.8**		**21.0**		**5.91**	**0%**

16. Summary of Operational Highlights & Problems

January 2019

- **Jan 18 –** Operations reduced wasting from 300 to 280 L/min due to a low MLSS in the Bioreactor.
- **Jan 18 –** Operations increased RAS rate up to 95% due to a high secondary sludge blanket.
- **Jan 18 –** Suntech on site to install new air flow sensor on Aerobic #3 air header pipe.(contractor)
- **Jan 28 –** Started shipping daily and weekly Ammonia samples out to external lab (Exova Calgary) for Influent and Effluent testing after it was determined that the onsite RO water system had failed. Due to the water system being down operations are unable to preform TAN testing onsite and will continue to ship to Exova for testing until water system is repaired.

February 2019

- **Feb. 5 –** Increased DO set points in the bioreactor to assist with the decreasing temperature in the bioreactor due to seasonal weather. Also decreased WAS rate to 250 L/min to retain biomass to help with treatment.
- **No other reported changes recorded in log book for the month of February.**

March 2019

- **Mar 5 -** Operations manually lowered UV slide gate down to 16.5 inches from 17.5 inches from the bottom of the UV channel as per advice from the manufacture to try and improve treatment with disinfection of the final Effluent.
- **Mar 6 -** Switched over to RAS pump #2 and increased speed to 100% due to a 10 foot sludge blanket recorded in the Secondary Clarifier.
- **Mar 12 -** Increased Primary Clarifier wasting from 35 m^3 to 40 m^3 due to an increasing sludge blanket from springtime runoff.
- **Mar 20 -** High Country Vac services onsite to clean out Alum holding tote and spill containment after operations found some piping that had burst from cold temperatures. The Alum system has been placed out of service till repairs can be made.(early spring)
- **Mar 21 -** Drive motor for the Polymer mixing paddle in the mix tank has failed resulting in operations placing a temporary recirculation pump in the tank till a new motor can be sourced out.

April 2019

- **Apr 1 -** High Country Vac services on site to remove blockage in the primary discharge line.
- **Apr 4 -** Suntech Electrical and Stein Excavating started work on the secondary power relocation for the WWTP in preparation for the construction of CTU #2 in July 2019.
- **Apr 5 -** Reduced WAS rate from 350 l/min to 330 l/min due to a drop in MLSS.
- **Apr 5 -** Increased primary wasting from 35 m^3 to 38 m^3 due to a 5 ft. sludge blanket in the primary.
- **Apr 8 -** Operations placed Disc Filter #2 offline for a 48 hr cleaning and inspection.
- **Apr 9 -** Effluent spray pump that supplies internal process water to the Bioreactor and Odour control system mechanically failed and a new pump has been ordered. (4-6 weeks)
- **Apr 17 -** Provincial lab (Calgary) made a testing error on the weekly coliform tests that we sent in for testing forcing operations to send in a new sample on April 20th as shown in the results on page 7.
- **Apr 18 -** Canadian Underwater diver's onsite to preform quarterly inspection of the Secondary mechanism to record any changes in measurements from previous dives but none were found.
- **Apr 25 -** Southern Alberta Maintenance (SAM) installed a new UV level control sensor in the PLC cabinet and placed UV slide gate back into normal operation.

May 2019

- **May 6 -** Acute Toxicity test collected and sent off to Nautilus Environmental lab Calgary for testing.
- **May 8 -** High Country Vac services onsite to backflush the Primary sludge discharge line due to a blockage.
- **May 12 -** Operations installed new suction lines and strainers on both Influent and Effluent composite samplers.

June 2019

- **June 17 -** Southern Alberta Maintenance (SAM) installed a new recirculation pump on the Daf Unit due to the old pump at end of life cycle (pump #2).
- **June 23 -** The on-call operator was called out at a 11:30 pm due to low DO levels in zones 2 and 3, all three air blower's were on and running at 100% but were unable to maintain proper DO levels that are set in SCADA. Operations has noticed a higher BOD loading coming into the plant due to the summer sewer main flushing program taking place in town which might be a contributing factor on the loading of the bioreactor.

July 2019

- **July 3** - The new secondary power lines were installed feeding the plants power to make way for the construction of the new CTU #2, operations ran the plant off generator power from 6:00am till 7:45pm while the cut over was taking place.
- **July 9** - Southern Alberta Maintenance completed the instillation of the Effluent spray pump that supplies process water to the internal processes within the plant and placed back into service.
- **July 9** - Balzers Inc. onsite to replace the discharge line from the DAF unit's recirculation pumps with a stainless steal pipe due to the old line showing sings of corrosion.
- **July 10** - High Country Vac services onsite to clean out Grit Vortex system so that operations could preform a scheduled inspection of the system.
- **July 14** - Operations was forced to shut off wasting from the Bioreactor due to a failure with the top drive VFD that controls the top skimmer had failed.
- **July 16** - Suntech Electrical installed new VFD in the DAF Unit and operations started wasting from the Bioreactor at 5:00pm at 300 l/min.
- **July 23** - Operations having issues in the afternoon with Air Blower #2 faulting out on high temperature alarm due to hot weather being experienced throughout the day.
- **July 29** - Northern Underwater onsite to do the quarterly dive inspection of the Secondary Clarifier mechanism and it was determined that there was little to no change in the condition.

August 2019

- **Aug 19** - Operations reset main power to Denitrification pump due to a power failure to ground fault alarm on the VFD.
- **Aug 21** - Operations experiencing air blower #2 shutting down on high temperature alarms throughout the day due hot weather in the southern region.
- **Aug 23** - Stampede Crane Services on site to lift out Denitrification pump and install the shelf spare as there was an issue found on the original pumps power cable causing the pump to fail to ground.

September 2019

- **Sept 10 -** ATCO Gas Company installed new gas line feeding plant to make room for the new CTU.
- **Sept 12 -** Operations reduced wasting from the Primary Clarifier from 36 m^3 to 34 m^3 due to a 3 foot sludge blanket in the tank.
- **Sept 12 -** The rail system failed on the Denitrification pump forcing operations to pump overland from Aerobic cell #3 to the front of the Bioreactor for the Denitrifying process until repairs can be made.
- **Sept 12 -** Air blower #3 compression unit failed and was sent into Calgary for repairs. It was determined by the shop that the Blower is beyond repair and a new part has been ordered.
- **Sept 12 -** Operations took Flow EQ offline in preparation of sanitary bypassing of all the flow entering the plant due to the instillation of the new 900mm sanitary line.
- **Sept 23 -** Northern Underwater divers on site to preform inspection of the Secondary rake mechanism and to assist operations with the lowering of the denitrification pump back onto its pipe mounting bracket.
- **Sept 24 -** Southern Alberta Maintenance installed a rebuilt shelf spare blower unit on loan from Canmore's WWTP until the newly purchased unit arrives.
- **Sept 26 -** Stein Excavating started bypass pumping of the Influent feeding the plant from sewer mains north of the WWTP overland directly into the bottom of Screw pump #3 and started coring and installing the new 900mm sewer line into the lower headwork's channel.

October 2019

- Oct 2 – High Country Vac services onsite to drain the Primary grease pit and dispose of it in Calgary.
- Oct 3 – Instillation of the new 900mm sewer main entering the WWTP was completed and placed into service.
- Oct 3 – Operations lifted TWAS tank mixer #2 to remove rags from the propeller which was causing the mixer to go into fault.
- Oct 9 – Instillation of the new water main feeding the WWTP and all testing that was required was completed and passed prior to placing the service line in operation.
- Oct 24 – Operations increased wasting from the Bioreactor from 300 L/min to 320 L/min to assist with excess foaming issues noticed in the aerobic zones.
- Oct 25 – Ballast card for (Bank B, Mod #3, Bulbs 1&2) had faulted and was replaced and placed back into service.
- Oct 26 – Operations returned wasting from the Bioreactor back to 300 L/min from 320 L/min due to the foaming issue clearing up.
- Oct 29 – Operations found that the HSBY PLC (A) had gone offline and had to be restarted.

November 2019

- **Nov 2** – Suntech electrical called to site to replace drive starter that controls the top skimmer for the DAF unit due to failure of unit.
- **Nov 12** – Northern Underwater dive crew onsite to preform inspection of the Secondary Clarifier mechanism and it was found that another support brace had to be strapped up to prevent further damage to brace.
- **Nov 21** – Simson Maxwell (generator repair) was onsite to replace speed sensor on the UV generator.
- **Nov 25 – Official transfer over of the utilities and staff from EPCOR back to the Town of Okotoks took place at 12:00 pm.**

December 2019

- **Dec 4 –** Suntech Electrical onsite to repair the old starter for the Fine Screen to allow operations to run system in auto mode.
- **Dec 16 –** High Country Vac services onsite to remove blockage in the discharge line from the Primary Clarifier to TWAS tank.

17. Operator Certification

As required under section 4.2 of Approval No. 1028-03-00, the wastewater treatment facility is classified as **Class IV** and the wastewater collection system is classified as **Class III**. The facilities are classified in accordance with the *Water and Wastewater Operators' Certification Guidelines.*

As per approval section 4.2.2(b), the operation of the wastewater treatment facility shall be performed by, or under the direction of:

a) One operator who holds a valid Level IV (or higher) WWT (Wastewater Treatment) Operators Certificate of qualification; and
b) Two operators each with a valid Level III (or higher) WWT Operators Certificate, and
c) One operator with a Level II WWT (or higher) certificate, in charge of each of each shift

As per approval section 4.2.2(a), the operation of the wastewater collection system shall be performed by, or under the direction of:

a) An operator who holds a valid Level III (or higher) WWC (wastewater collection) Operators Certificate; and
b) At least one other operator who holds a valid Level II (or higher) WWC Operators Certificate

- The EPCOR/Town of Okotoks operators are certified as shown within the table below**:**

Name	Position	Wastewater Treatment	Wastewater Collection	Cert. Number
Ed Spohr **	Site Manager	Level 3	Level 1	1993
Pacer Wilson	Lead Hand	Level 2	Level 3	2956
James McElmon	Lead Hand	Level 4	Level 2	4045
Johnathan Bartisch	Operator	Level 4	Level 2	2944
Jordan Ballard	Operator	Level 3	Level 1	3714
Terry Sapsford	Operator	Level 3	Level 2	4318
Doug Farough **	Operator	Level 2	Level 3	3852
Marlon Anthony	Operator	Level 2	Level 1	4944
Bryan Steed	Operator	Level 1	Level 3	2292
Patti Kjinserdahl	Operator	N/A	Level 2	2429

Note: ** Operators did not transfer over to the Town of Okotoks (Nov. 25/19)

Site Manager Contact Information:

Rakesh Savani
Water Services Manager
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Okotoks, AB T1S 1K1
Bus: (403) 995-6306
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Supervising Operator Contact Information:

James McElmon
Lead Hand – WWT Operations
Town of Okotoks
200 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Bus: (403) 995-6343
Cell: (403) 899-9343
Email: jmcelmon@okotoks.ca

18. Supervising Operator

	**James McElmon**	**4045**
Signature	Printed	Certificate #