TOWN OF OKOTOKS

WASTEWATER SYSTEM

2021 ANNUAL REPORT

Approval # 1028-03-00

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1. Wastewater System Introduction

The Town of Okotoks operates and maintains the wastewater system in Okotoks 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,
- It is exercising due diligence by requiring that a reasonable level of quality assurance is in place.
- Has identified risks to the utility and has prepared remedial action plans for improvements.

<u>Components of the QA Program</u>

1. Monthly Reports
2. Analysis of daily QA/QC Proficiency Testing samples.
3. Review of monthly and annual utility performance reports.
4. Tracking and review of site incident reports.
5. The plan and procedures will be at least on an annual basis, and amended as necessary.

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	339	330	352	345	332	311	327
					MAX	686	578	436	534	725	503	477
					AVG	474	443	389	413	429	386	392
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	292	260	256	236	240	248	260
					MAX	632	652	324	428	1204	364	1092
					AVG	408	363	294	313	365	294	360
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	6174	6187	6260	6228	6182	6275	5991
					MAX	7027	7037	7524	7135	7567	7419	7030
					AVG	6469	6548	6704	6529	6685	6653	6428
					TOTAL	**200541**	**183337**	**207809**	**195879**	**207240**	**199601**	**199279**
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	282	327	224	362	326	**224**
					MAX	531	600	551	767	761	**767**
					AVG	392	397	394	479	462	**421**
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	140	152	172	216	160	**140**
					MAX	612	576	496	1920	1016	**1920**
					AVG	325	283	299	493	407	**350**
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	5878	5947	6208	6182	6098	**5878**
					MAX	7437	6994	7366	7204	7177	**7567**
					AVG	6422	6364	6542	6571	6603	**6543**
					TOTAL	**199093**	**190905**	**202809**	**197140**	**204683**	**2388316**
BOD5 - Biochemical Oxygen Demand **TSS - Total Suspended Solids**											

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	32.6	37.0	30.6	34.6	32.6	31.0	33.7
					MAX	44.5	43.4	43.5	43.8	47.9	40.1	38.4
					AVG	38.4	40.7	38.2	39.5	38.7	36.6	35.7
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	6.60	6.00	6.30	6.60	3.10	4.60	2.50
					MAX	14.30	9.60	7.90	7.90	46.60	7.60	9.10
					AVG	8.32	7.62	6.86	7.02	11.41	7.01	7.12

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	32.7	40.7	42.5	43.7	44.7	**30.6**
					MAX	46.9	51.2	49.9	49.2	52.8	**52.8**
					AVG	39.6	45.3	45.8	46.2	48.5	**41.1**
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	6.10	6.70	6.30	6.40	7.00	**2.50**
					MAX	14.70	9.20	7.80	18.40	39.40	**46.60**
					AVG	7.99	7.32	7.05	9.41	10.79	**8.16**

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	2.3	< 2.0	< 2.0	< 2.0	2.8	2.5	2.6
						MAX	11.2	6.0	5.2	7.5	8.2	10.5	11.2
						AVG	4.1	3.7	2.5	2.8	4.7	5.0	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	< 2.0
						MAX	3.0	3.5	2.0	4.4	5.7	5.2	4.4
						AVG	2.2	2.1	< 2.0	2.2	2.4	2.3	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	< 2.5	< 2.2	< 2.5
						MAX	6.4	3.5	3.5	4.6	6.7	6.0	6.2
						AVG	3.0	2.6	2.5	2.6	2.8	3.2	4.1
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	3688	6012	5990	5965	5937	5978	5778
						MAX	8034	6931	7095	7646	7247	7089	7061
						AVG	6307	6412	6436	6437	6465	6445	6275
						TOTAL	**195530**	**179544**	**199520**	**193106**	**200405**	**193352**	**194533**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand (<) Estimated results due to test results below minimum detectable limits.
TSS - Total Suspended Solids

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	2.0	< 2.0	< **2.0**
						MAX	6.3	5.7	6.5	11.5	6.4	**11.5**
						AVG	3.8	3.5	3.4	4.1	2.5	**3.8**
$CBOD_5$ 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	3.3	3.7	2.8	5.8	5.4	**5.8**
						AVG	2.1	2.1	2.1	2.7	2.2	**2.2**
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**
						MAX	3.6	< 2.5	< 2.5	3.7	< 2.5	**6.7**
						AVG	2.6	< 2.5	< 2.5	2.6	< 2.5	**2.8**
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	5724	5965	5646	3103	5839	**3103**
						MAX	7342	6967	7183	7182	6799	**8034**
						AVG	6284	6354	6443	6157	6351	**6364**
						TOTAL	**194797**	**190615**	**199725**	**184712**	**196866**	**2322705**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand (<) Estimated results due to test results below minimum detectable limits.
TSS - Total Suspended Solids

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	< 0.50	< 0.50	< 0.50	< 0.50	0.50	< 0.50
						MAX	4.23	< 0.50	1.16	7.10	7.40	2.29	2.10
						AVG	1.21	< 0.50	0.55	1.05	1.56	0.86	0.67
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.12	0.10	0.08	0.04	0.15	0.07	0.04
						MAX	0.46	0.26	0.53	3.08	4.10	0.30	0.30
						AVG	0.22	0.16	0.17	0.34	0.32	0.18	0.21
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A			> 100			> 100		

Note: 1) All samples tested for Acute Lethality in 2021 are reported as > 100 (Not Acutely Lethal).

2) Changed onsite testing Total Phosphorous from a distillation method to HACH TNT+ method in August 2021

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	0.07	0.06	0.04	0.05	0.02	**0.02**
						MAX	0.78	1.16	3.23	5.37	0.91	**7.40**
						AVG	0.43	0.26	0.52	1.15	0.24	**0.75**
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.11	0.15	0.08	0.06	0.09	**0.04**
						MAX	0.91	0.41	1.38	1.31	2.10	**4.10**
						AVG	0.23	0.23	0.18	0.49	0.63	**0.28**
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A		> 100			> 100		**AVG > 100**

NOTE: 1) All samples tested for Acute Lethality in 2021 are reported as > 100 (Not Acutely Lethal).

2) Changed onsite testing Total Phosphorous from a distillation method to HACH TNT+ method in August 2021

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	1.76	1.67	1.58	1.54	2.34	1.83	2.03
						MAX	3.96	1.90	2.55	5.01	3.94	4.80	2.74
						AVG	2.76	1.79	1.98	2.64	3.09	2.88	2.41
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	1.87	4.49	3.98	4.12	5.66	5.55	5.65
						MAX	4.73	6.80	4.41	6.29	6.76	6.55	6.49
						AVG	3.80	5.25	4.28	5.09	6.13	6.03	6.15
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	5.83	6.30	5.95	6.46	8.17	7.95	8.12
						MAX	7.04	8.70	6.93	11.30	9.98	10.35	8.90
						AVG	6.56	7.04	6.27	7.74	9.23	8.91	8.57

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	1.51	1.40	1.42	1.58	1.55	**1.40**
						MAX	3.31	1.70	2.02	4.56	1.97	**5.01**
						AVG	2.18	1.62	1.62	2.55	1.76	**2.27**
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	6.16	6.98	6.30	5.07	3.15	**1.87**
						MAX	6.60	8.18	7.31	6.34	5.64	**8.18**
						AVG	6.38	7.36	6.80	5.86	4.35	**5.62**
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	7.67	8.38	7.75	6.92	5.02	**5.02**
						MAX	9.55	9.79	8.92	10.50	7.19	**11.30**
						AVG	8.55	8.98	8.42	8.41	6.11	**7.90**

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	< 10	10	< 10	10	780	10	230
						Geometric Mean	< 10	10	< 10	10	38	10	22
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	< 10	< 10	< 10	< 10	109	10	20
						Geometric Mean	< 10	< 10	< 10	< 10	18	10	12

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	118	30	20	120	< 10	780
						Geometric Mean	29	13	12	27	< 10	15
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	< 55	10	10	40	< 10	109
						Geometric Mean	< 14	10	10	17	< 10	11

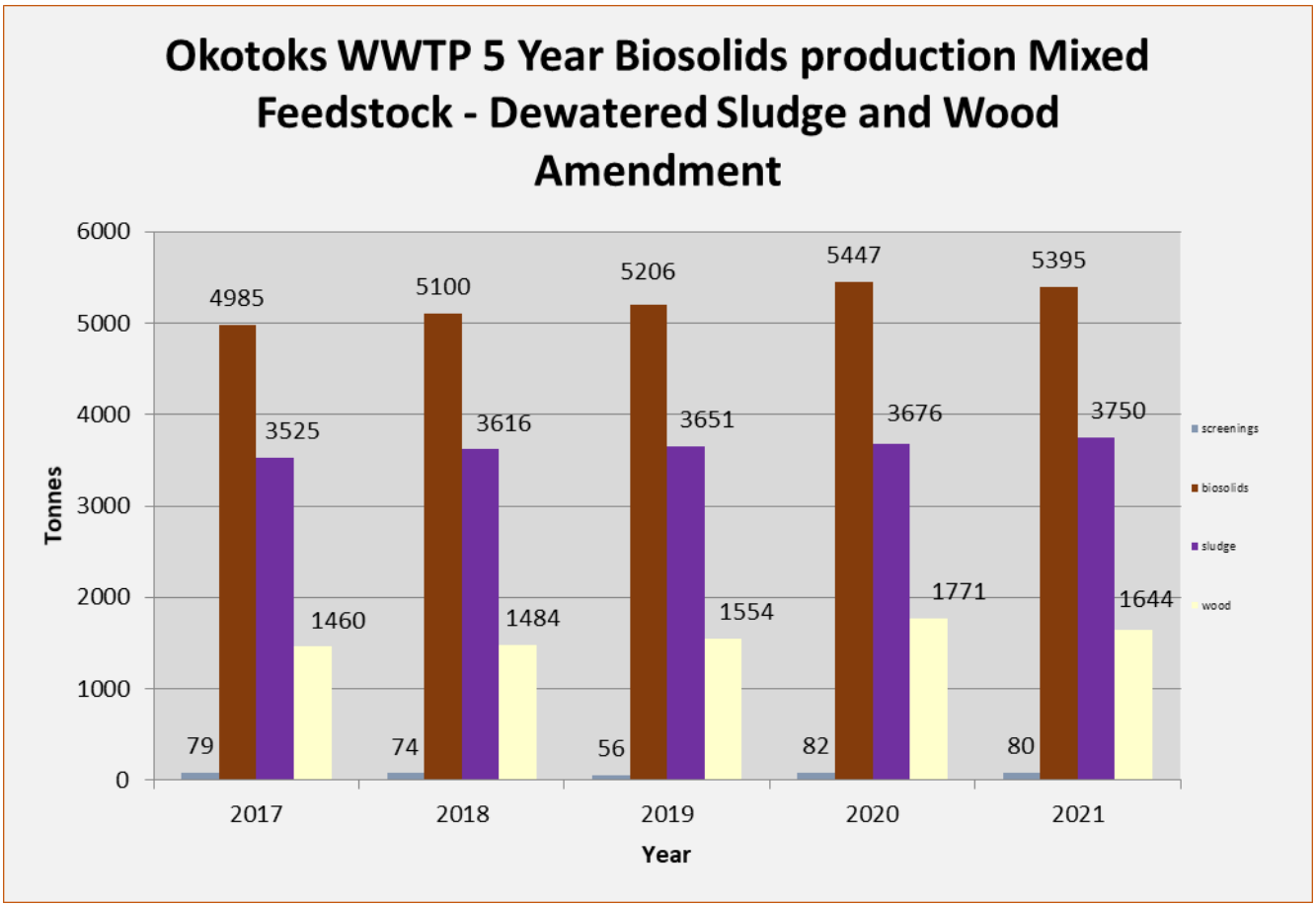
NOTE: Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.

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

Okotoks Wastewater Treatment Plant
2021 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	289.6	5.4	13.0	160.3	2.7	7.5	449.9	8.1	20.1	7.1	hauled to landfill: kept separate
FEB	324.1	0.0	21.9	150.1	0.0	11.2	474.2	0.0	33.1	7.1	from Biosolids Compost.
MAR	404.8	3.8	21.8	174.6	1.8	9.1	579.4	5.6	30.9	7.9	
APR	316.8	0.0	14.4	141.5	0.0	6.9	458.2	0.0	21.3	7.5	2) All raw feedstock
MAY	357.9	6.7	16.1	144.8	2.5	5.5	502.8	9.2	21.5	7.8	(dewatered sludge & sawdust)
JUN	345.7	8.0	13.4	151.9	3.5	5.6	497.7	11.6	19.0	6.1	sent to approved regional compost
JUL	319.7	3.8	14.6	137.6	1.7	6.2	457.3	5.5	20.4	5.9	facility - EcoAg.
AUG	285.9	4.1	12.9	122.9	1.8	5.4	408.8	5.9	18.1	6.5	
SEP	265.0	4.1	12.5	112.4	1.8	5.3	377.4	5.9	17.7	4.9	3) Wood amendment supplied
OCT	297.3	4.0	13.0	123.1	1.8	5.4	420.4	5.8	18.3	5.5	by Spray Lakes Sawmills.
NOV	243.8	0.0	21.0	100.2	0.0	8.7	344.0	0.0	29.7	6.3	
DEC	299.8	0.0	15.7	125.1	0.0	7.3	424.9	0.0	23.0	7.3	
TOTAL	**3750.4**			**1644.4**			**5394.8**			**79.9**	
AVG	312.5			137.0			449.6			6.7	
MIN	243.8			100.2			344.0			4.9	
MAX	3750.4			174.6			579.4			7.9	***WAS: Waste Activated Sludge***

10. Chart – WWTP: Five Year Biosolids Production



11. Summary of Incidents Reported to AEP – 2021

- **AEP Reference No. 386589 – Okotoks WWTP Primary influent spill.**

The incident occurred on Wednesday 22nd, 2021, between 11:30 am to 11:40 am. The location of the incident was in the Town of Okotoks at the Town of Okotoks wastewater treatment plant (WWTP).
The incident was a release of a mixture of Primary influents from the splitter box, located upstream of the primary clarifier, onto the ground, which flows toward the east but is contained within the WWTP plant site. The spill area was a combination of gravel, snow, and Icey surfaces and did not enter adjoined drainage or waterways.

- **AEP Reference No. 386831 – Okotoks WWTP Total Phosphorous monthly limits.**

The incident occurred for the month of December 2021.The location of the incident was in the Town of Okotoks at the Town of Okotoks wastewater treatment plant (WWTP).
The incident reported was due to an exceeded monthly arithmetic mean of the total phosphorus limits set by AEP in our approval to operate under the environmental protection and enhancement act. The Town of Okotoks continuously discharges treated effluent directly into the Sheep River which is a fish bearing river, the monthly limit the approval is set at ≥0.5 mg/L but our testing shows an average value of 0.63 mg/L for the month of December 2021.

Note: there were no reportable incidents within the collection system in 2021 for the Town of Okotoks.

12. Summary of Treated Wastewater used for Irrigation – 2021

- There was no treated wastewater used for irrigation purposes in 2021

13. WWTP Uncommitted Hydraulic Reserve Capacity – 2021-2025

WWTP Uncommitted Hydraulic Reserve Capacity

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	**2021**	***2022**	***2023**	***2024**	***2025**
Average Daily Flow - 2021	m3/d		6,543	6,954	7,148	7,343	7,538
Average Daily Flow Per Capita (F)	m3/capita/d		0.218	0.225	0.225	0.225	0.225
Hydraulic Reserve Capacity (Cr)	m3/d		3,457	3,046	2,852	2,657	2,463
Number of Unconnected Approved Lots (L)	lots		352	370	370	370	370
Connected Population (P)	persons		30,040	30,905	31,770	32,635	33,500
Number of Residential Connections (H)	connections		9,495	11,446	11,767	12,087	12,407
Committed Reserve (Com)	m3/d		243	225	225	225	225
Uncommitted Reserve Capacity (Cu)	m3/d		3,214	2,822	2,627	2,432	2,238
Cr = Design Capacity – Average Daily Flow Cu = Cr – [L*F*P/H] 2021 connected Population is based on Federal census data			*Years 2022-20225 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 - 2021

Summary of Chemicals Used in 2021				
MONTH	**Zetag 8190 Dry Polymer kg**	**ALUM kg**	**Sodium Hypochlorite 16% L**	**Sodium Sulfite - Dechlorination tablets Kg**
Jan	1072	0	0	0
Feb	595	0	0	0
Mar	758	0	40	2
Apr	633	0	20	1
May	559	0	0	0
Jun	896	0	0	0
Jul	481	0	20	1
Aug	442	0	0	0
Sep	382	0	20	1
Oct	462	0	20	1
Nov	279	0	0	0
Dec	345	1809	0	0
TOTAL	**6904**	**1809**	**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

15. Summary of WSER Testing – 2021

WSER Monitoring Requirements 2021 - Town of Okotoks WWTP							
Parameter							
Sample Type	24 Hour Composite						Grab
Parameter	CBOD		TSS		Total Ammonia		Acute Lethality
Environment Canada Limits	> or <	< 25 mg/L	> or <	< 25 mg/L	> or <		<50%
Date							
6-Jan-21		4.3		2.2		1.79	01-Feb-21
20-Jan-21		3.2	<	2.0		0.78	>100
3-Feb-21		3.2	<	2.0	<	0.05	
17-Feb-21		4.1		3.0		0.53	
3-Mar-21		4.1		2.8		0.19	
17-Mar-21		5.1	<	2.0		0.41	
31-Mar-21		3.5	<	2.0		1.59	
Q1 AVG		**3.9**		**2.3**		**0.76**	
Q1 MIN		**3.2**	**<**	**2.0**	**<**	**0.05**	
Q1 MAX		**5.1**		**3.0**		**1.79**	
14-Apr-21		2.4	<	2.0		0.26	10-May-21
28-Apr-21		4.4		2.0		3.46	>100
12-May-21		3.9		2.6		1.17	
26-May-21		5.2		2.2		2.59	
9-Jun-21		3.9		2.6		0.53	
23-Jun-21		4.6		3.2		1.37	
Q2 AVG		**4.1**		**2.4**		**1.56**	
Q2 MIN		**2.4**		**2.0**		**0.26**	
Q2 MAX		**5.2**		**3.2**		**3.46**	
7-Jul-21		3.5		2.6		1.04	02-Aug-21
21-Jul-21		4.6		4.8		0.56	>100
4-Aug-21		3.3		3.0		0.22	
18-Aug-21		3.4	<	2.0		0.41	
1-Sep-21		2.6	<	2.0		0.13	
15-Sep-21	<	2.7	<	2.0		0.15	
29-Sep-21		4.0	<	2.0		0.26	
Q3 AVG		**3.4**		**2.6**		**0.40**	
Q3 MIN		**2.6**		**2.0**		**0.13**	
Q3 MAX		**4.6**		**4.8**		**1.04**	
13-Oct-21		5.4	<	2.0		0.42	01-Nov-21
27-Oct-21	<	2.7	<	2.0		0.10	>100
9-Nov-21		3.9	<	2.0		0.74	
24-Nov-21	<	2.6	<	2.0		0.12	
8-Dec-21		2.9		2.2		0.15	
20-Dec-21		3.0	<	2.0		0.45	
Q4 AVG		**3.4**		**2.0**		**0.33**	
Q4 MIN		**2.6**	**<**	**2.0**		**0.10**	
Q4 MAX		**5.4**		**2.2**		**0.74**	
Annual AVG		**3.7**		**2.3**		**0.76**	**>100**
Annual MIN	**<**	**2.4**	**<**	**2.0**	**<**	**0.05**	**>100**
Annual MAX		**5.4**		**4.8**		**3.46**	**>100**

16. Summary of Operational Highlights & Problems

January 2021

- **Jan 4**- Maple Reinders started de-watering CTU #2 through Secondary clarifier #1 after leak testing was passed and signed off by AECOM.
- **Jan 5** – Maple Reinders continues to drain CTU #2 via Secondary #1.
- **Jan 5** – Total Controls on site to programme LCP 710 that controls the new CTU #2.
- **Jan 6** – The new hybrid blower placed in service and suppling air to both CTU's.
- **Jan 7** – Dewatering of CTU #2 was completed today through Secondary #1.
- **Jan 10** – Operations increased RAS rate from 90% to 95% and increased WAS rate from 290 L/min to 320 L/min due to high solids in the plants effluent causing issues within all 3 disc filters.
- **Jan 12** – Operations started seeding CTU #2 with seed sludge from CTU #1 as flow was introduced to the new CTU #2.
- **Jan 12** – Operations temporally stopped flow to the Disc filter and UV building so that the effluent discharge pipe could be connected to the effluent main line from the secondary clarifiers.
- **Jan 14** – CTU #2 officially started flowing over the secondary weir at 2:00pm with a flow of 60% to CTU #2 and 40% to CTU #1 of the total plant flow.

February 2021

- **Feb 1** – Acute Lethality sample collected and shipped to CARO labs (Edmonton for testing, results as shown on page 10 of this report.
- **Feb 5** – Operator called to site after hours due to a foaming issue on CTU #2 causing the WAS chamber to fill to the hi level mark and pumps not able to pump, operator added water to the pit to assist with foaming issues and was able to control levels in the pit.
- **Feb 6** – Operations arrived on site in the morning to find the rotating scum weir had froze with the low overnight temperatures causing surface wasting issues in CTU #2.
- **Feb 7** – Operations with assistance from Maple Reinders (general contractor) placed a rented frost fighter over the worm gear of the rotating scum weir to thaw and resume wasting from CTU #2.
- **Feb 9** – Operations increased denitrification from 6600 m3 to 7200 m3/day on CTU #2.
- **Feb 12** – High Country Vac services on-site to transfer 30 m3 of primary sludge to TWAS tank due to the discharge line having a blockage because of thick sludge.
- **Feb 24** – Operations lowered RAS rate in CTU #2 from 5200 m3 to 4800 m3 due to a low sludge blanket in secondary #2.
- **Feb 28** – Operator was called in afterhours due to an influent sampler fault callout alarm caused by a clogged suction strainer, the strainer was cleaned and sampler was placed back into regular service.

March 2021

- **Mar 1 –** Disc filter #2 was placed offline for its 48 hour cleaning.
- **Mar 2 –** New centrifuge feed pump #2 brought online and old pumps were decommissioned.
- **Mar 3 –** Maintenance replaced the backwash pump on disc filter #3 due to failure with original pump.
- **Mar 7 –** Operations increased WAS rate in CTU #1 from 190 L/min to 225 L/min due to an increasing sludge blanket depth in secondary #1.
- **Mar 8 –** Disc filter #1 was placed offline for its 48 hour cleaning.
- **Mar 17 –** Operations with the help from Maintenance department decommissioned and removed blower #4 form the primary pump house.
- **Mar 18 –** Operations reduced RAS rate from 95% to 90% hand speed.

- **Mar 30 –** Contractor onsite to install new VFD for the Denitrification pump on CTU #2 due to wrong VFD installed during construction, Denitrification pump was offline from 8:00am till 3:00pm during this instillation.
- **Mar 31 –** Operations lowered WAS rate on CTU #1 from 210 L/min to 190 L/min.

April 2021

- **Apr 2 –** WAS rate increased in CTU #1 from 190 L/min to 220 L/min.
- **Apr 4 –** Mixer #1 on CTU #1 faulted out and was lifted to remove a rag buildup within the unit's blades after inspection it was lowered back in and returned to service with no further issues.
- **Apr 11 –** Operations had to place Primary clarifier into a backwash cycle to remove blockage in the suction side of the pumps, a large blockage was also removed from the front of primary pump #2 prior to placing back into service.
- **Apr 13 –** High Country Vac services onsite to steam and flush out primary sludge discharge line from the Primary Clarifier to TWAS tank.
- **Apr 18 –** Operations experienced a communication failure on the back drive modular speed sensor on the centrifuge and after diagnosing the issue SUNTECH found a loose wire within the control panel.
- **Apr 26 –** CTU #1 placed off line in preparation of draining the unit for repairs.
- **Apr 27 –** ARCHER separation onsite for the start-up of the new polymer makeup system for the solids handling process.
- **Apr 27 –** Maintenance replaced the fine screen basket and brushes on the fine screen unit in headwork's.
- **Apr 27 –** Operations started draining CTU #1 into CTU #2 as system has been taken off line for the summer for repairs.
- **Apr 29 –** WWTP having operational issues with air supply system since taking CTU #1 offline which shut down the system from 2:30 pm to 7:00pm until programming could be changed by SUNTECH to fix valve positioning issues.

May 2021

- **May 5 –** Operations increased RAS rate from 130 L/min to 150 L/min in CTU #2.
- **May 8 –** DAF unit was drained and cleaned out due to overloading of sludge from CTU #1 drain down/cleaning.
- **May 11 –** A1 concrete and coring onsite to core 14" holes in all partition walls in CTU #1 to assist with future filling and draining of the unit.
- **May 19 –** Operations increased the RAS rate on CTU #2 from 50 L/min to 70 L/min.

June 2021

- **Jun 1 –** Operations was called into the WWTP afterhours for a high temperature alarm on the UV PLC cabinet, once onsite the operator opened the cabinet to cool system due to a failed AC unit within the cabinet.
- **Jun 17 –** Operations increased the WAS rate from 260 L/min to 280 L/min on CTU #2 due to an increasing MLSS volume.
- **Jun 20 –** Operations experiencing issues with WAS pumps in the CTU #2 when switching pumps due to an air locking issue in the discharge piping.

July 2021

- **Jul 3 –** Decreased WAS rate from 280 L/min to 260 L/min on CTU #2 due to a decrease in MLSS.
- **Jul 12 –** Operations placed Disc filter #2 offline for 48 hour cleaning.
- **Jul 17 –** On call operator was called into the WWTP due to a brief power failure which resulted in multiple processes needing restarted and placed back online.(DAF unit, WAS pumps, UV PLC and the polymer system)
- **Jul 26 –** Decreased WAS rate on CTU #2 from 270 L/min to 250 L/min due to a decreasing SVI volume.

August 2021

- **Aug 11 –** On call operator was called into the WWTP after hours due to a failed UPS in the MCC-K room, the UPS was bypassed until repairs could be made by the supplier.
- **Aug 17 –** The battery cell was replaced by vendor of the UPS in MCC –K room as it was a warrantee issue.
- **Aug 26 –** Screw pump #3 (new asset) started its 7 day test run by Maple Reinders.

September 2021

- **Sept 5 –** On call operator was called into the WWTP after hours due to a LCP hot standby alarm, after further investigation it was found that a communication card within the LCP standby had failed and needed replaced by SUNTECH.
- **Sept 22 –** Disc filter #3 placed offline for 48 hours clean cycle.

October 2021

- **Oct 4 –** SIFI industries onsite to start repairs on secondary #1 rake mechanism and scum beach.
- **Oct 7 –** SIFI industries onsite to repair and replace mixers rails and WAS rail systems on CTU #1.
- **Oct 17 –** On call operator called into the WWTP afterhours due to the Hybrid blower faulting out on suction pressure low alarm, was found that a dirty air intake filter was to blame.
- **Oct 20 –** SUNTECH electrical installed new SCADA computers in both the control room and lab.
- **Oct 21 –** High Country Vac services onsite to steam and cleanout Primary discharge line from Primary Clarifier to TWAS tank.

November 2021

- **Nov 1 –** Suntech Electrical onsite to troubleshoot Centrifuge VFD high temperature alarm, was found to be a faulty temperature sensor and replaced.
- **Nov 2 –** Screw pumps #1 and #2 (new assets) were started for the 7 day test runs at the same time to speed up commissioning.
- **Nov 8 –** Maintenance replaced a faulty starter on the Odour control VFD as it faulted sometime during the overnight period the day before.
- **Nov 9 –** Operations started flow into CTU #1 and used seed sludge from CTU #2 during the filling of the Bioreactor #1.
- **Nov 9 –** Influent flow MAG meter calibrated and certified by third party contractor.
- **Nov 15 –** Flow EQ tank placed offline due to upcoming construction of the headwork's upgrade.
- **Nov 19 –** Operations reduced WAS rate on CTU #2 from 150 L/min to 130 L/min and turned on the WAS on CTU #1 at 85 L/min.
- **Nov 29 –** increased WAS rate on CTU #2 from 100 L/min to 130 L/min.

December 2021

- **Dec 6 –** Operations decreased minimum valve open position on CTU #2 to 32% on zone #2 and 30% on zone #3 due to high DO values recorded in the Bioreactor.
- **Dec 6 –** Operations set RAS pumps for CTU #1 and #2 in auto and set at 100% inflow value.
- **Dec 8 –** Operations placed RAS pumps back into hand on both CTU's to assist with better Total Phosphorous removal.
- **Dec 10 –** Operations fixed leaks found on Alum piping from which appeared to be caused from freezing at some point so that system can be place d into service to assist with TP removal.
- **Dec 12 –** Alum system started at 2:30 pm after verifying that all leaks have been repaired to the system, flow was set at .43L/min to CTU #2.
- **Dec 21 –** Decreased RAS rate in CTU #1 from 6300 m^3/D 6100 m^3/D and decreased RAS rate in CTU #2 from 9400 m^3/D to 8500 m^3/D.
- **Dec 22 –** Power shut down for MCC-HE and MCC-K both were ran off temporary power during the time needed for installation of new power buckets in MCC-HE fro the solids handling upgrade.
- **Dec 22 –** Call made to AEP regarding sewage spill within the WWTP grounds see above section for details.
- **Dec 26 –** Operator was called out to the WWTP at 11:00pm due to secondary #1 on high torque due to extremely old temperatures causing forming of ice on mechanisms.
- **Dec 26 –** DAF unit faulted out due to an air line discharge pipe failing at compressor, maintenance was able to repair fitting and place back into service.
- **Dec 29 –** High Country Vac services onsite to clear grease blockage at Primary clarifiers scum beach and also drained grease pit and disposed of it in Calgary.
- **Dec 31 –** Call was made in regards to Decembers total phosphorus limits monthly value exceeding the approval limit set by AEP. (see above section for details)

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 Town of Okotoks operators are certified as shown within the table below**:**

Name	Position	Wastewater Treatment	Wastewater Collection	Cert. Number
Rakesh Savani	Operations Manager	N/A	N/A	N/A
Pacer Wilson	Lead Hand WT	Level 2	Level 3	2956
James McElmon	Lead Hand WWT	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
Marlon Anthony	Operator	Level 2	Level 1	4944
Bryan Steed	Operator	Level 1	Level 4	2292
Patti Kjinserdahl	Operator	N/A	Level 2	2429
Terry Novak	Operator	Level 1	Level 1	5316
Marcus Hladik	Operator	Level 1	Level 2	5936

Site Manager Contact Information:

Rakesh Savani
Water Services Manager
Town of Okotoks
100 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Bus: (403) 995-6306
Cell: (587) 432-6448
Email: rsavani@okotoks.ca

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 #