

# TOWN OF OKOTOKS

## WASTEWATER SYSTEM

### 2016 ANNUAL REPORT



Approval # 1028-03-00

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## **1. Wastewater System Introduction**

EPCOR Water Services have prepared the Water and Wastewater Annual reports on behalf of the Town of Okotoks. EPCOR and the Town of Okotoks have entered into an agreement to operate and maintain the wastewater system in Okotoks which commenced as of June 1<sup>st</sup>, 2005. The current wastewater treatment facility is a Level IV Tertiary BNR (biological nutrient removal) treatment process with continuous discharge to the Sheep River.

## **2. EPCOR Quality Assurance Program**

The EPCOR Water Services Quality Assurance Program for external sites is intended to be part of a larger overall company 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 EPCOR 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 EPCOR 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.

An acceptable defined level of quality assurance on operational performance is specifically required by the EPCOR Risk Management Internal Audit.

### **Components of the External Sites QA Program**

To satisfy these general requirements, the EPCOR Water Services Quality Assurance section will act as an auditor independent of operational management at each external site. The goal is to ensure that data is produced, recorded and reported in manners that are consistent with ISO 17025 requirements.

The components of the quality assurance program will include:

1. Initial QA assessments of new sites.
2. Ongoing routine site QA audits.

3. Preparation of audit reports and follow-up.
4. Analysis of EPCOR internal monthly Proficiency Testing (PT) samples.
5. Review of monthly and annual utility performance reports.
6. Tracking and review of site incident reports.
7. Development and review of site cross-connection control program (CCC).
8. Development and review of site watershed protection programs.
9. Training of operators at external sites on analytical procedures as required.

The plan and procedures will be reviewed regularly, 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 6-2**

Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System												
Untreated Wastewater (Raw Influent) : BOD <sub>5</sub> - TSS - VOLUME												
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location		Jan	Feb	Mar	Apr	May	Jun	Jul
BOD <sub>5</sub>	mg/L	Once per day	Composite	Entering WWTP	MIN	319	299	318	341	240	284	279
					MAX	569	528	768	635	734	714	>972
					AVG	414	398	437	458	440	452	376
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	180	238	240	232	228	232	198
					MAX	536	328	364	338	362	512	750
					AVG	299	272	278	278	276	284	265
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Entering WWTP	MIN	6630	4565	6195	3782	6084	6564	6540
					MAX	7618	7189	7210	7143	7735	7541	8161
					AVG	6999	6596	6643	6447	6713	6934	7060
					TOTAL	216973	191281	205918	193412	208089	208027	218865
BOD <sub>5</sub> - Biochemical Oxygen Demand TSS - Total Suspended Solids												

**Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System**  
**Untreated Wastewater (Raw Influent) : BOD<sub>5</sub> - TSS - VOLUME**

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location		Aug	Sep	Oct	Nov	Dec	Annual
BOD <sub>5</sub>	mg/L	Once per day	Composite	Entering WWTP	MIN	259	329	269	283	310	240
					MAX	654	615	604	708	924	>972
					AVG	384	399	426	439	484	426
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	206	244	252	186	236	180
					MAX	406	498	482	776	512	776
					AVG	265	296	328	325	304	289
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Entering WWTP	MIN	6748	6274	6297	6168	6099	3782
					MAX	7480	7771	7221	6950	6950	8161
					AVG	7074	6720	6568	6448	6513	6726
					TOTAL	219294	201595	203612	193445	201905	2462416
BOD <sub>5</sub> - Biochemical Oxygen Demand TSS - Total Suspended Solids											

**4. Summary of WWTP Untreated Wastewater Influent: Monthly Summaries; Ammonia/Total Phosphorus**  
**Approval 1028-03-00; Table 6-2**

Approval # 1028-03-00; Table 6-2: 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	31.4	34.5	33.4	37.0	29.7	32.3	27.9
					MAX	40.5	38.0	36.0	40.0	41.0	37.6	33.4
					AVG	36.0	35.9	35.1	38.6	36.8	33.9	30.9
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	5.90	6.00	4.05	5.60	5.20	5.80	4.90
					MAX	7.95	7.20	7.60	7.80	7.70	7.40	7.40
					AVG	6.84	6.60	6.43	6.65	6.49	6.41	5.90

**Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System**  
**Untreated Wastewater : 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	28.6	32.5	31.5	28.9	32.8	27.9
					MAX	35.0	36.5	37.7	40.0	43.2	43.2
					AVG	31.2	34.8	33.7	35.5	36.4	34.9
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	5.20	5.20	5.10	5.90	5.70	4.05
					MAX	7.70	7.70	8.60	8.70	8.50	8.70
					AVG	6.02	6.40	6.72	6.95	6.83	6.52



**5. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; BOD/CBOD/TSS/Volume**  
**Approval 1028-03-00; Table 6-2**

Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System													
Treated Wastewater: BOD <sub>5</sub> - CBOD <sub>5</sub> - TSS - VOLUME													
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
BOD <sub>5</sub> MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	2.1	2.0	2.0	2.5	< 2.0	< 2.0	< 2.0
						MAX	10.0	10.2	8.6	13.4	7.5	4.1	3.8
						AVG	4.7	5.4	4.8	6.7	3.7	2.5	2.6
CBOD <sub>5</sub> 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	3.3	6.4	3.4	6.5	3.9	2.0	2.4
						AVG	2.2	2.4	2.6	3.3	2.2	2.0	2.0
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	6.5	4.0	3.8	5.1	3.7	2.5	2.5
						AVG	2.9	2.7	2.8	3.4	2.6	2.5	2.5
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Prior to Release	N/A	MIN	6845	6609	6508	6319	6417	6829	6827
						MAX	8019	7437	7399	7516	8030	8024	9050
						AVG	7259	6923	6875	6769	6933	7245	7498
						TOTAL	225042	200754	213140	203076	214925	217347	232426
BOD <sub>5</sub> - Biochemical Oxygen Demand													
CBOD <sub>5</sub> - 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 6-2: Monitoring - Town of Okotoks Wastewater System**  
**Treated Wastewater: BOD<sub>5</sub> - CBOD<sub>5</sub> - TSS - VOLUME**

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
BOD <sub>5</sub> 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	4.5	4.7	4.6	4.0	4.8	13.4
						AVG	2.8	3.3	2.8	3.0	3.2	3.8
CBOD <sub>5</sub> 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	4.7	2.8	4.3	3.8	3.5	6.5
						AVG	2.2	2.1	2.1	2.1	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
						MAX	3.0	< 2.5	< 2.5	< 2.5	< 2.5	6.5
						AVG	2.6	< 2.5	< 2.5	< 2.5	< 2.5	2.7
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Prior to Release	N/A	MIN	7074	6645	6507	6225	2388	2388
						MAX	8050	8193	7409	7023	7054	9050
						AVG	7501	7033	6791	6534	6363	6977
						TOTAL	232530	211004	210534	196014	197241	2554033

BOD<sub>5</sub> - Biochemical Oxygen DemandCBOD<sub>5</sub> - Carbonaceous Biochemical Oxygen Demand

TSS - Total Suspended Solids

&lt; 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 6-2**

Approval # 1028-03-00; Table 6-2: 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 : 0.05 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L	MIN	< 0.025	0.074	0.313	0.125	0.051	< 0.025	< 0.025
						MAX	0.926	2.650	2.930	10.000	0.960	0.203	0.047
					Jul 1 - Sep 30 ≤ 5mg/L	AVG	0.268	0.492	1.161	4.171	0.266	0.061	0.031
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.12	0.12	0.05	0.14	0.04	0.10	0.11
						MAX	0.22	0.20	0.23	0.30	0.19	0.20	0.70
						AVG	0.15	0.16	0.17	0.23	0.14	0.13	0.29
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A			> 100			> 100		
<p>NOTE 1 : All samples tested for Acute Lethality in 2016 are reported as &gt; 100 (Not Acutely Lethal).</p> <p>NOTE 2 : Started testing TAN on September 9, 2016 at onsite lab.</p> <p>NOTE 3 : MDL - EXOVA = 0.025 mg/L MDL - Okotoks lab = 0.05 mg/L</p>													

Approval # 1028-03-00; Table 6-2: 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 : 0.05 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L	MIN	< 0.025	0.048	< 0.50	< 0.50	< 0.50	< <b>0.025</b>
					Jul 1 - Sep 30 ≤ 5mg/L	MAX	0.340	< 0.500	0.70	0.50	1.20	<b>10.00</b>
						AVG	0.043	0.383	0.51	0.50	0.55	<b>0.70</b>
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.14	0.07	0.07	0.08	0.04	<b>0.04</b>
						MAX	0.52	0.22	0.53	0.70	0.73	<b>0.73</b>
						AVG	0.29	0.13	0.18	0.30	0.20	<b>0.20</b>
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A		> <b>100</b>			> <b>100</b>		<b>AVG</b>  <b>&gt; 100</b>
<p>NOTE 1 : All samples tested for Acute Lethality in 2016 are reported as &gt; 100 (Not Acutely Lethal).</p> <p>NOTE 2 : Started testing TAN on September 9, 2016 at onsite lab.</p> <p>NOTE 3 : MDL - EXOVA = 0.025 mg/L MDL - Okotoks lab = 0.05 mg/L</p>												

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

Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System													
Treated Wastewater: NITROGEN : TKN - NO <sub>2</sub> NO <sub>3</sub> - 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	0.66	1.06	1.19	1.80	1.18	1.00	1.25
						MAX	2.18	2.06	2.59	11.60	6.55	1.92	1.95
						AVG	1.24	1.63	2.10	6.41	2.75	1.35	1.67
NO <sub>2</sub> - NO <sub>3</sub> MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.9	5.2	4.4	3.0	0.5	5.7	4.6
						MAX	6.2	6.1	5.9	5.2	6.0	6.1	5.5
						AVG	6.0	5.6	5.0	4.1	4.5	5.9	5.1
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	6.5	6.8	6.6	7.0	6.8	7.1	6.4
						MAX	8.4	8.2	7.4	14.6	7.7	7.7	7.4
						AVG	7.2	7.2	7.1	10.5	7.3	7.3	6.9
TKN - Total Kjeldahl Nitrogen													
NO <sub>2</sub> - NO <sub>3</sub> - Nitrite and Nitrate Nitrogen													
TN - Total Nitrogen													

## Approval # 1028-03-00; Table 6-2: Monitoring - Town of Okotoks Wastewater System

Treated Wastewater: NITROGEN : TKN - NO<sub>2</sub> NO<sub>3</sub> - 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	0.79	0.60	0.61	0.23	1.77	<b>0.23</b>
						MAX	3.30	1.97	1.78	1.64	4.49	<b>11.60</b>
						AVG	1.91	1.38	1.25	1.09	2.77	<b>2.13</b>
NO <sub>2</sub> - NO <sub>3</sub> MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	2.6	5.2	3.6	6.2	5.3	<b>0.5</b>
						MAX	5.7	6.1	6.4	6.4	6.9	<b>6.9</b>
						AVG	4.6	5.7	5.5	6.3	6.3	<b>5.4</b>
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	5.9	6.7	4.2	6.5	8.0	<b>4.2</b>
						MAX	7.3	7.8	8.0	7.9	10.8	<b>14.6</b>
						AVG	6.6	7.1	6.8	7.4	9.1	<b>7.5</b>

TKN - Total Kjeldahl Nitrogen

NO<sub>2</sub> - NO<sub>3</sub> - Nitrite and Nitrate Nitrogen

TN - Total Nitrogen

**8. Summary of WWTP Parameters: Total and Faecal Coliforms: Monthly Summaries**  
**Approval 1028-03-00; Table 6-2**

Approval # 1028-03-00; Table 6-2: 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	30	10	< 10	< 10
						Geometric Mean	< 10	10	< 10	13	10	< 10	< 10
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	< 10	< 10	< 10
						Geometric Mean	< 10	< 10	< 10	10	< 10	< 10	< 10
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 6-2: Monitoring - Town of Okotoks Wastewater System

## Treated Wastewater: TOTAL &amp; 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	$\leq 1000$ per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	10	10	10	< 10	< 10	30
						Geometric Mean	10	10	10	< 10	< 10	10
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	$\leq 200$ per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	10	< 10	< 10	< 10	< 10	10
						Geometric Mean	10	< 10	< 10	< 10	< 10	10

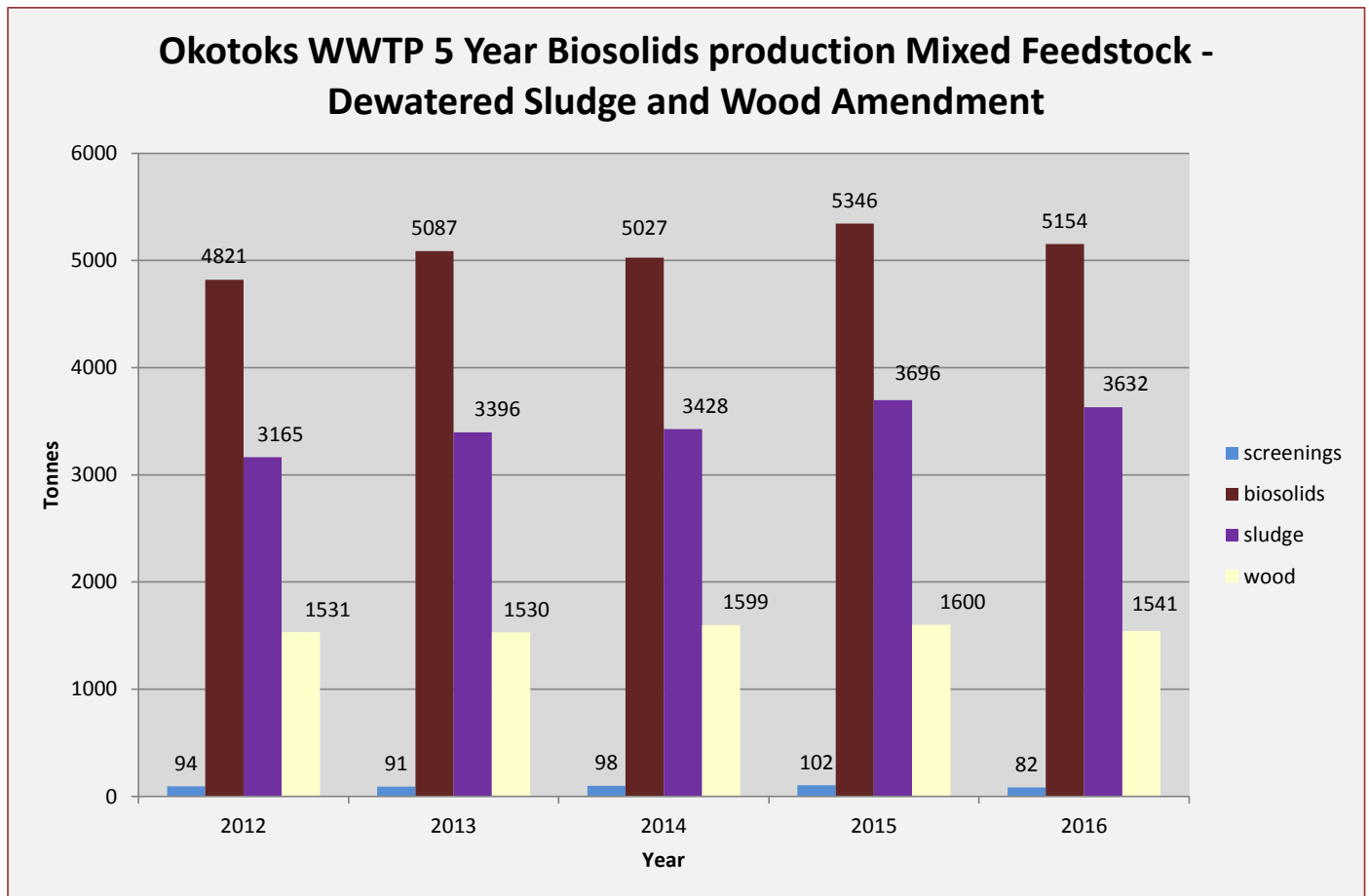
NOTE: Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.



**9. Summary of WWTP Parameters: Sludge/Partially Composted Sludge: Monthly Summaries**  
**Approval 1028-03-00; Table 6-2**

<b>EPCOR Water Services - Okotoks Wastewater Treatment Plant</b> <b>2016 Annual Partially Composted Sludge Production MIN/MAX/AVG</b>											
	COMPOST FEEDSTOCK						SOLIDS SHIPPED FROM WWTP				General Notes
	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	
Month	Metric Tonnes						Metric Tonnes				1) Raw Screenings/Grit hauled to landfill: kept separate from Biosolids Compost.  2) All raw feedstock (dewatered sludge & sawdust) sent to approved regional compost facility - EcoAg.  3) Wood amendment supplied by Spray Lakes Sawmills.  <b>WAS: Waste Activated Sludge</b>
JAN	340.8	8.1	13.2	154.6	3.5	6.3	495.3	11.7	19.2	8.6	
FEB	330.0	8.2	13.2	149.0	3.7	6.0	460.3	11.9	19.1	6.1	
MAR	332.8	7.8	14.3	141.2	2.9	6.0	474.0	11.1	19.4	5.2	
APR	303.5	4.4	13.4	137.2	2.0	6.1	440.7	6.3	19.5	6.6	
MAY	315.7	8.0	13.0	142.7	3.6	5.8	458.5	11.6	18.8	7.2	
JUN	293.5	4.2	13.4	127.9	1.7	6.1	421.4	6.1	19.5	6.6	
JUL	298.5	6.2	12.9	124.3	2.8	5.5	422.8	9.1	18.4	4.7	
AUG	269.2	6.9	11.8	106.3	2.0	4.8	375.5	9.3	16.6	7.3	
SEP	265.9	4.4	13.2	106.1	1.8	5.3	371.9	6.2	18.4	7.3	
OCT	294.2	6.1	13.8	117.9	2.4	5.5	412.2	8.5	19.3	5.9	
NOV	276.4	3.9	13.4	111.0	1.5	5.5	387.4	5.4	19.0	8.7	
DEC	311.4	6.4	13.4	122.9	1.7	5.5	434.3	8.2	18.7	8.2	
<b>TOTAL</b>	<b>3631.8</b>			<b>1541.1</b>			<b>5154.2</b>			<b>82.3</b>	
<b>AVG</b>	302.7			128.4			429.5			6.9	
<b>MIN</b>	265.9			106.1			371.9			4.7	
<b>MAX</b>	3631.8			154.6			495.3			8.7	

## 10. Chart – WWTP: Five Year Biosolids Production



## 11. Summary of Incidents Reported to AEP – 2016

There were no contraventions to report in 2016.

## 12. Summary of Treated Wastewater used for Irrigation – 2016

There was no treated wastewater used for irrigation purposes in 2016.

**13. WWTP Uncommitted Hydraulic Reserve Capacity – 2016-2020****WWTP Uncommitted Hydraulic Reserve Capacity**

<b>Municipality</b>	Town of Okotoks	<b>Facility</b>	Okotoks Wastewater Treatment Plant
<b>Supervising Operator</b>	Johnathan Bartisch	<b>Phone No.</b>	(403) 899-6345
<b>Treatment Type</b>	Mechanical – Tertiary BNR	<b>Design Capacity (m3/d)</b>	10,000

	<b>Year</b>	<b>2016</b>	<b>*2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Average Daily Flow - 2016</b>	m3/d	6,726	6,682	6,877	7,071	7,266
<b>Average Daily Flow Per Capita (F)</b>	m3/capita/d	0.233	0.225	0.225	0.225	0.225
<b>Hydraulic Reserve Capacity (Cr)</b>	m3/d	3,274	3,318	3,123	2,929	2,734
<b>Number of Unconnected Approved Lots (L)</b>	lots	378	370	370	370	370
<b>Connected Population (P)</b>	persons	28,833	29,698	30,563	31,428	32,293
<b>Number of Residential Connections (H)</b>	connections	10,754	10,999	11,320	11,640	11,960
<b>Committed Reserve (Com)</b>	m3/d	236	225	225	225	225
<b>Uncommitted Reserve Capacity (Cu)</b>	m3/d	3,038	3,093	2,899	2,704	2,509

Cr = Design Capacity – Average Daily Flow

 $Cu = Cr - [L * F * P / H]$ 

2016 connected Population is based on Federal census data

\*Years 2017-2020 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 - 2016**

<b>Summary of Chemicals Used in 2016</b>				
<b>MONTH</b>	<b>Zetag 8190 Dry Polymer kg</b>	<b>ALUM kg</b>	<b>Sodium Hypochlorite 16% L</b>	<b>Sodium Sulfite - Dechlorination tablets Kg</b>
Jan	428	0	0	0
Feb	435	0	0	0
Mar	468	0	20	1
Apr	391	0	20	1
May	402	0	0	0
Jun	418	0	0	0
Jul	440	0	20	1
Aug	429	389	0	0
Sep	419	50	40	2
Oct	368	1492	20	1
Nov	412	1377	0	0
Dec	534	0	0	0
<b>TOTAL</b>	<b>5142</b>	<b>3308</b>	<b>120</b>	<b>6</b>
1 Dry Polymer used in Sludge Dewatering process. 2 Sodium Hypochlorite used for cleaning Disk Filtration process ( <u>Not for Treatment</u> ). 3 Sodium Sulfite used for dechlorination after disk filter cleaning and returned to primary clarifier. 4 Alum used for Chemical Phosphorus removal.				

## 15. Summary of WSER Testing – 2016

WSER Monitoring Requirements 2016 - Town of Okotoks WWTP										
Parameter										
Sample Type	24 Hour Composite								Grab	
Parameter	CBOD		TSS		Un-ionized Ammonia				Acute Lethality	
					Total Ammonia		pH @ 15 °C	Un-ionized Ammonia		
Environment Canada Limits	Λ Q V	< 25 mg/L	Λ Q V	< 25 mg/L	Λ Q V			Λ Q V	≤ 1.25 mg/L as N @ 15°C	<50%
Date										
13-Jan-16	<	4		3		0.033	7.82		0.0006	
27-Jan-16	<	4		2		0.333	7.54		0.0032	
10-Feb-16	<	4	<	2		0.116	7.36		0.0007	
24-Feb-16	<	4		2		0.195	7.90		0.0042	
9-Mar-16	<	4		3		0.470	8.25		0.0219	
23-Mar-16	<	4		2		0.605	7.82		0.0108	
										10-Feb-16
Q1 AVG	<	4		2		0.292	7.78		0.0069	100%
Q1 MIN	<	4	<	2		0.033	7.36		0.0006	
Q1 MAX	<	4		3		0.605	8.25		0.0219	
6-Apr-16	<	4		4		8.220	7.63		0.0955	
20-Apr-16	<	4		2		0.125	7.65		0.0015	
4-May-16	<	4		4		0.114	7.76		0.0018	
18-May-16	<	4	<	1		0.047	7.63		0.0005	
1-Jun-16	<	4	<	1	<	0.025	7.66	<	0.0003	
15-Jun-16	<	4	<	1		0.035	7.78		0.0006	
29-Jun-16	<	4		2		0.029	7.85		0.0006	
										09-May-16
Q2 AVG	<	4		2		1.228	7.71		0.0144	100%
Q2 MIN	<	4	<	1	<	0.025	7.63	<	0.0003	
Q2 MAX	<	4		4		8.220	7.85		0.0955	
13-Jul-16	<	4		2		0.034	7.83		0.0006	
27-Jul-16	<	4	<	1	<	0.025	7.94		0.0006	
10-Aug-16	<	4	<	2		0.027	7.98		0.0007	
24-Aug-16	<	4		3	<	0.025	7.69		0.0003	
7-Sep-16	<	4		2		0.069	8.20		0.0029	
21-Sep-16	<	4	<	1		0.055	7.78		0.0009	
										08-Aug-16
Q3 AVG	<	4		2		0.039	7.90		0.0010	100%
Q3 MIN	<	4	<	1	<	0.025	7.69		0.0003	
Q3 MAX	<	4		3		0.069	8.20		0.0029	
5-Oct-16	<	4	<	1		0.050	7.66		0.0006	
19-Oct-16	<	4	<	1	<	0.025	7.68		0.0003	
2-Nov-16	<	4	<	2	<	0.025	7.71	<	0.0003	
16-Nov-16	<	4	<	1	<	0.025	7.67	<	0.0003	
30-Nov-16	<	4	<	2	<	0.025	7.59	<	0.0003	
14-Dec-16	<	4	<	1		0.045	7.89		0.0009	
28-Dec-16	<	4		3		0.735	7.54		0.0070	
										07-Nov-16
Q4 AVG	<	4		2		0.133	7.68		0.0014	100%
Q4 MIN	<	4	<	1	<	0.025	7.54	<	0.0003	
Q4 MAX	<	4		3		0.735	7.89		0.0070	
Annual AVG	<	4		2		0.423	7.77		0.0059	
Annual MIN	<	4	<	1	<	0.025	7.36	<	0.0003	
Annual MAX	<	4		4		8.220	8.25		0.0955	

## 16. Summary of Operational Highlights & Problems

### January 2016

- **Jan 4** – Steve Hewitt (SAM) on-site to repair issues on the PLC 700 hot stand-by.
- **Jan 4** – Increased DAF top collector speed from 5 to 7 due to high solids. (operations)
- **Jan 5** – Increased WAS rate from 250 to 260 L/min to lower MLSS. (operations)
- **Jan 19** – Increased Primary wasting from 32 to 36 m<sup>3</sup>/Day due to sludge blanket at 6 ft. (operations)
- **Jan 20** – Inspection was performed on all 3 disc filters (UV Building) and there was 1 panel in disc filter #3 that needed replacing before being placed back into service. (operations)

### February 2016

- **Feb 8** – Vector on site to program all 3 air blowers to communicate with the new DO sensors that were installed in January's bioreactor upgrade.
- **Feb 10** – Increased WAS rate from 280 L/min to 300 L/min. (operations)
- **Feb 11** – High Country Vac. Services on site to steam clean out primary discharge line to Twas tank due to blockage in line.
- **Feb 19** – Replaced UV bulbs in channel #1 modular #3 lights #7/8. (operations)
- **Feb 29** – Called in (SAM) to troubleshoot/repair issues operations is having with centrifuge feed pumps losing there network connection during the day.

### March 2016

- **Mar 7** – Placed disc filter # 1 offline for scheduled cleaning was found that one panel needed replacing due to a rip in the panel; Filter was placed back into service Mar. 8. (operations)
- **Mar 14** –Operator on call was called to the WWTP due to an influent sampler alarm it was found that the suction line was cracked and needed replaced. The sampler then resumed its regular sampling schedule with no missed samples within its 24 hour composite sample.
- **Mar 24** – Decreased wasting from 300 to 280 L/min due to low MLSS in bioreactor.(operations)
- **Mar 30** – Work begins on bioreactor DO control testing preformed by operations and (SAM) Steve Hewitt, will run the next couple of weeks with a lower average DO set point in the aerobic zones to try and lower the blowers needed output speeds.

### April 2016

- **Apr. 1** – Operations continues to try and run bioreactor with a average lower DO set point after air valves and air blowers where commissioned to run in auto last month.
- **Apr. 1** – SAM (southern Alberta maintenance) added disc filter and effluent sampler communication fail alarms into SCADA.
- **Apr. 1** – SAM renewed SCADA licence.
- **Apr. 4** – Inspection performed on all 3 disc filters was found that 3 panels needed replaced due to tears and 8 spray nozzles needed unplugging.(operations)
- **Apr. 7** – Increased RAS rate from 80% to 85% due to high solids accumulation in the secondary clarifier.(operations)
- **Apr. 14** –Increased average DO set points in the bioreactor due to higher then average test results in plant effluent quality, operations will closely monitor effluent quality in the weeks to come.
- **Apr. 16** – Increased WAS rate from 275 L/min to 300 L/min.(operation)
- **Apr. 21** – SAM reloaded firm-ware on PLC 700 hot standby to deal with the issues operations was having since Apr.19th.

- **Apr. 27** – Simson Maxwell on site to preform annual inspections and load tests on the plants backup generators.(contractor)

### **May 2016**

- **May 9** – High Country Vac services onsite to clean transfer line from Primary clarifier to TWAS tank.
- **May 12** – Operator was called into the WWTP due to a Disc Filter #2 drum fail to start alarm, the filter was placed offline until the faulty VFD could be repaired.
- **May 15** – Operations placed Screw Pump #3 offline due to grinding noises coming from lower chamber.
- **May 16** – Operations removed Twas tank mixer #1 to remove blockage and inspect mixer, was determined to be in good shape and returned back into service.
- **May 17** – (SAM) installed new VFD into Disc Filter #2 and placed back into service.
- **May 28** – New Odour Control sump pump installed due to operations having issues with original factory pump failing to start over the last couple of days.

### **June 2016**

- **June 4** – Operator called into WWTP due to Blowers alarming on high temperature, alarms where due to high outside temperatures.(operations)
- **June 7** – Inspections preformed on Disc Filters 1 - 3 and all necessary repairs made.(operations)
- **June 9** – (SAM) Installed new hydraulic pump on Pugmill #2.
- **June 11** – High Country Vac services on site to remove accumulated grit buildup in main channel in Headworks.(contractor)
- **June 22** – Operations changed out both Influent and effluent composite samplers suction line tubing.
- **June 22** – Operations switched over to Sludge pump #2 due to blockage causing pump #1 to fail.(centrifuge)
- **June 28** – Operator called into WWTP at 5:15 pm due to inlet chamber high level alarm caused by heavy rainfall at this time.

### **July 2016**

- **July 8** – Higher then average flows due to a blockage in the Cimarron river lead that was discovered and unplugged.
- **July 8** – Replaced sampler tubing on both composite samplers.(operations)
- **July 11** – Auto dialer /phone lines were damaged due to a lightning strike near the Waste Water treatment plant, operators physically did plant rounds every 3 hours until the repair was made on Wednesday.
- **July 15** – High Country Vac services on-site to clean out Grit Vortex and Grit Classifier due to a blockage in the air lift line of the Grit Vortex.(contractor)
- **July 17** – Operations was forced to turn on second Screw Pump due to high flows coming into the plant (17,000 m<sup>3</sup>).
- **July 20** – Operations took Disc Filter #3 off line for scheduled cleaning. (2 days)
- **July 22** – Increased RAS rate 5 % hand speed to lower secondary sludge depth.(operations)
- **July 22** – Increased DO set points in all 3 aerobic zones due to higher then normal TP results.
- **July 28** – Decreased WAS rate 300 L/min → 280 l/min to build MLSS in the bioreactor.

### **August 2016**

- **August 2** – Call out at 8:15pm for a power surge caused by the onset of a storm.
- **August 5** – Decreased wasting from primary clarifier to build up a better blanket for VFA production.
- **August 11** – Installation of the second sweep arm on the secondary clarifier.

- **August 14** – Call out at 9:45pm for a power surge caused by the onset of a storm.
- **August 16** – Call outs at 4:30pm and 8:40pm for UV PLC failure and influent hi level alarms.
- **August 28** – Turned on ALUM pumps to increase Phosphorus removal.

### September 2016

- **Sept 6** – Call out at 8:00pm for screw auger failure to start and high level alarm.
- **Sept 13** – Call out at 8:15pm for screw auger failure to start and high level alarm.
- **Sept 16** – Call out at 5:50pm for aeration blower #2 over heating.
- **Sept 27** – SunTech electrical onsite to repair/replace common grounds for screw pumps 1, 2, and 3 in south MCC room.
- **Sept 28** – Blazar's onsite to remove screw pump #3 for bottom bearing replacement.
- **Sept 28** – Trinity Mechanical onsite to install new relays on the MUA#1.
- **Sept 29** – Blazar's onsite to install headworks lids after verifying the screw auger #3 bottom bearing is working and operational.

### October 2016

- **October 3** – Shut down screw pump #3 due to bottom coupler failing sometime during the weekend.
- **October 6** – Increased daily wasting from the primary from 28 m<sup>3</sup> → 30 m<sup>3</sup>.
- **October 15** – Air blower #3 placed out of service due to the blower drive failing, operations will run air blower #4 to help with DO demand until repair can be preformed.
- **October 31** – Operations placed disc filter #3 offline for scheduled cleaning.

### November 2016

- **Nov 1** – Increased Primary wasting from 28 m<sup>3</sup> to 30 m<sup>3</sup> due to increased sludge blanket.(operations)
- **Nov 1** – SunTech electrical on site to install new drive for air blower #3.
- **Nov 3** – Operations placed disc filter #3 back into service was offline for scheduled cleaning.
- **Nov 4** – High Country Vac services on site to steam clean discharge line from Primary to Twas tank.
- **Nov 5** – Operations added Alum to the treatment process to try and assist with Phosphorous removal.
- **Nov 18** – Increased secondary wasting from 260 L/min to 280 L/min. (operations)
- **Nov 19** – Operations turned on the Alum system to assist in Phosphorous removal for the weekend and was turned off on Nov. 21.
- **Nov 27** – Operator was called out due to a Influent sampler fault caused by a blockage on the suction line screen, the problem was corrected and sampling resumed as scheduled.

### December 2016

- **Dec 5** – Back flushed primary clarifier due to blockage in sludge discharge line was able to free blockage and return primary back into operation.(operations)
- **Dec 5** – Increased daily primary wasting from 30 m<sup>3</sup> to 32 m<sup>3</sup>.
- **Dec 22** – New VFD installed for sludge feed pump #1 (centrifuge feed) due to old VFD failure.(SunTech Electrical)
- **Dec 28** – Operator was called to the WWTP due to an influent sampler failure, was found that the suction line screen weight had fallen off; operator fixed the issue and resumed the sampler to normal operations.
- **Dec 29** – New lower bearing installed on screw pump #3 and was placed back into service.(Blazer's)
- **Dec 30** – Routine inspection performed on all three disc filters with no issues to report.(operations)



## 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:

- One operator who holds a valid Level IV (or higher) WWT (Wastewater Treatment) Operators Certificate of qualification; and
- Two operators each with a valid Level III (or higher) WWT Operators Certificate, and
- 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:

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

As per approval section 4.2.3, the operation of the sludge composting facility shall be performed by, or under the direction of, an operator who holds a minimum **Level IB Compost Facility Operator Certification**.

- The EPCOR operators in Okotoks are certified as shown within the table below:

Name	Position	Wastewater Treatment	Wastewater Collection	Composting	Cert. Number
Darren Peel	Site Manager	Level 2	Level 2		3697
Pacer Wilson	Lead Hand	Level 2	Level 3		2956
Corey Hodgson	Lead Hand	Level 1	Level 3		2529
Johnathan Bartisch	Operator	Level 4	Level 2	Level 1B	2944 / 1080(Compost)
James McElmon	Operator	Level 3	Level 2		4045
Jordan Ballard	Operator	Level 3	Level 1		3714
Terry Sapsford	Operator	Level 2	Level 2		4318
Doug Farough	Operator	Level 2	Level 2		3852
Phil Carefoot	Operator	Level 2	Level 2		3220
Bryan Steed	Operator	Level 1	Level 3		2292
Patryk Vanson	Operator	Level 1	Level 2		4021
Patti Kjinserdahl	Operator	N/A	Level 2		2429

**Site Manager Contact Information:**

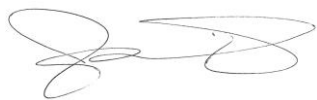
Darren Peel  
Site Manager – Okotoks Operation  
EPCOR Water Services Inc.  
200 – 1118 North Railway Street  
Okotoks, AB T1S 1K1  
Bus. (403) 938-1230 ext. 5  
Cell. (403) 803-1998  
Email. [dpeel@epcor.com](mailto:dpeel@epcor.com)

**Supervising Operator Contact Information:**

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Supervising Operator  
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200 – 1118 North Railway Street  
Okotoks, AB T1S 1K1  
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**18. Supervising Operator**

Operator in Charge:



Signature

Johnathan Bartisch

Printed

Date: February 8, 2017

Level IV Wastewater Treatment Certificate # 2944