TOWN OF OKOTOKS

WATERWORKS SYSTEM

2020 ANNUAL REPORT

Approval # 1029-03-00

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1. Waterworks Introduction

The Town of Okotoks Water Services has prepared the Waterworks Annual report. EPCOR Water Services Inc. operated and maintained the waterworks system on behalf of the Town of Okotoks from Jun 1st, 2005 until Nov 25th, 2019. Effective Nov 25th, 2019 the Town of Okotoks resumed responsibility to operate and maintain the waterworks system.
The Quality Assurance Program described was in effect until from Jun 1st, 2005 to Nov 25th, 2019.
The Town of Okotoks Water Services Department will be developing its QA Program, description below.

2. Quality Assurance Program

The Water Services Quality Assurance Program is a 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 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 internal and external audit purposes is also be able to demonstrate that:

- it is doing what it says it is doing in all its operations and it 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 its site.
- has identified risks to the utility and has prepared remedial action plans for improvements.

Components of the QA Program
To satisfy these general requirements, the Water Services Quality Assurance program will audit operational management. The goal is to ensure that data is produced, recorded, and reported in manners that are consistent with legislative requirements.

The components of the quality assurance program will include:

1. Monthly Reports
2. Analysis of the Water Services internal annual Proficiency Testing (PT) samples.
3. Review of monthly and annual utility performance reports.
4. Tracking and review of site incident reports.
5. Development and review of site cross-connection control program (CCC).
6. Development and review of site watershed protection programs.

The plan and procedures will be at least on an annual basis, and amended as necessary.

3. Annual Summary - Raw & Distribution Volumes

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System Water Parameter - Raw & Distribution Volume													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Raw Water Volume	m^3	Once Per Day	Continuous	Raw Water Entering the WTP	N/A	MIN	6043	6254	5618	6243	6535	6198	6011
						MAX	7407	7144	7453	7765	9580	9242	11364
						AVG	6594	6577	6631	6854	7699	7601	8259
						Total	204419	190723	205557	205616	238675	228015	256041
Distribution Volume Zone 1 South	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 1 South	N/A	MIN	2692	2679	2664	2774	2716	2787	2928
						MAX	3156	3120	3096	3204	4104	3924	5232
						AVG	2843	2825	2872	2920	3236	3260	3602
						Total	88140	81932	89020	87606	100320	97795	111654
Distribution Volume Zone 2 North	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 2 North	N/A	MIN	2630	2584	2565	2670	2639	2847	2896
						MAX	2902	3594	2797	3971	3777	4239	4288
						AVG	2771	2749	2697	2823	3036	3278	3268
						Total	85892	79723	83594	84695	94131	98351	101317
Distribution Volume Zone 3 North	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 3 North	N/A	MIN	1404	1009	1490	1537	1618	1505	1539
						MAX	1784	1695	1743	1770	2458	2346	2892
						AVG	1588	1515	1598	1628	1878	1768	1953
						Total	49225	43946	49546	48854	58222	53032	60540
Total Distribution Volume	m^3	Once Per Day	Continuous	Sum of Three Zones Distribution Volume	N/A	MIN	6909	6490	6748	7064	6977	7189	7396
						MAX	7770	7819	7569	8409	10339	10488	12412
						AVG	7202	7090	7166	7372	8151	8306	8823
						Total	223257	205601	222160	221155	252673	249178	273511

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Raw & Distribution Volume

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Raw Water Volume	m^3	Once Per Day	Continuous	Raw Water Entering the WTP	N/A	MIN	8518	6941	4298	5819	4647	**4298**
						MAX	11549	9520	8482	7270	7949	**11549**
						AVG	10271	8307	6827	6710	6636	**7414**
						Total	318412	249207	211623	201307	205720	**2715315**
Distribution Volume Zone 1 South	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 1 South	N/A	MIN	3207	3095	2796	2727	2736	**2664**
						MAX	5932	4212	3683	3268	3142	**5932**
						AVG	4473	3536	3043	2931	2891	**3203**
						Total	138667	106087	94321	87927	89612	**1173081**
Distribution Volume Zone 2 North	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 2 North	N/A	MIN	3132	3044	2566	2573	2441	**2441**
						MAX	5185	3852	3039	2889	2756	**5185**
						AVG	3911	3298	2694	2718	2614	**2988**
						Total	121236	98926	83503	81525	81022	**1093915**
Distribution Volume Zone 3 North	m^3	Once Per Day	Continuous	Distribution Water Entering Zone 3 North	N/A	MIN	1814	1647	1529	1483	1549	**1009**
						MAX	3319	2522	2046	1801	1856	**3319**
						AVG	2484	2002	1662	1592	1680	**1779**
						Total	76995	60072	51525	47774	52077	**651808**
Total Distribution Volume	m^3	Once Per Day	Continuous	Sum of Three Zones Distribution Volume	N/A	MIN	8153	7841	6919	6801	6863	**6490**
						MAX	14436	10395	8768	7839	7754	**14436**
						AVG	10885	8836	7398	7241	7184	**7971**
						Total	337442	265085	229349	217226	222711	**2919348**

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
Transfer to Zone 2	m^3	Once Per Day	Continuous	Transfer to Zone 2	N/A	Total	116986	101084	115930	167418	136074	128806	143388
Transfer to Zone 3	m^3	Once Per	Continuous	Transfer to Zone 3	N/A	Total	45292	38650	45635	116104	55002	49899	57263
Zone 2(-)Zone 3	m^3	Once Per	Continuous	Zone 2(-)Zone 3	N/A	Total	71694	62434	70295	51314	81072	78907	86125
Distribution #2 Transfer to Zone 2 (+) South Reservoir	m^3	Once Per Day	Continuous	Distribution #2 Transfer to Zone 2 (+) South Reservoir	N/A	Total	205126	183016	204950	255024	236394	226601	255042
Distribution#1 less (-) Distribution #2	m3		Calculated	Distribution#1 less (-) Distribution #2	N/A	Total	18131	22585	17210	-33869	16279	22577	18469
Diiference between the Z2 & Trans to Z3 flow meter	m3		Calculated	Diiference between the Z2 & Trans to Z3 flow meter	N/A	Total	14198	17289	13299	33381	13059	19444	15192
ACTIFLO Totals	m^3	Once Per	Continuous	ACTIFLO Totals	N/A	Total	210261	195549	210011	209917	244536	233266	262878

NOTE: It has been determined the Zone 2 flow meter is not measuring correctly. Troubleshooting is being done to correct the problem.

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Transfer to Zone 2	m^3	Per	Continuous	Transfer to Zone 2	N/A	Total	180012	142111	117330	111462	113891	**1574492**
Transfer to Zone 3	m^3	Once Per	Continuous	Transfer to Zone 3	N/A	Total	74084	57282	48238	45153	47904	**680506**
Zone 2(-)Zone 3	m^3	Once Per	Continuous	Zone 2(-)Zone 3	N/A	Total	105928	84829	69092	66309	65987	**893986**
Distribution Total #2 Zone 2 (+) South Reservoir	m^3	Once Per Day	Continuous	Distribution Total #2 Zone 2 (+) South Reservoir	N/A	Total	318679	248198	211651	199389	203503	**2747573**
Distribution #2 Transfer to Zone 2 (+) South Reservoir	m3		Calculated	Distribution #2 Transfer to Zone 2 (+) South Reservoir	N/A	Total	18763	16887	17698	17837	19208	**171775**
Diiference between the Z2 & Trans to Z3 flow meter	m3		Calculated	Diiference between the Z2 & Trans to Z3 flow meter	N/A	Total	15308	14097	14411	15216	15035	**199929**
ACTIFLO Totals	m^3	Once Per	Continuous	ACTIFLO Totals	N/A	Total	325134	254651	216271	205010	210065	**2777549**

NOTE: It has been determined the Zone 2 flow meter is not measuring correctly. Troubleshooting is being done to correct the problem.

4. Annual Summary – Turbidity

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System Water Quality Parameter - Turbidity													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Turbidity Raw Water	NTU	Once Per Day	Grab	Raw Water Entering the WTP	N/A	MIN	0.05	0.05	0.05	0.05	0.07	0.06	0.06
						MAX	0.09	0.09	0.08	0.24	0.16	0.14	0.12
						AVG	0.07	0.06	0.06	0.12	0.10	0.08	0.08
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #1	≤ 1.0 NTU, 100% of the time	MIN	0.03	0.02	0.02	0.03	0.03	0.03	0.03
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.04	0.04	0.05	0.05	0.22	0.05	0.04
						AVG	0.03	0.03	0.03	0.03	0.06	0.04	0.03
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	0	0
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #2	≤ 1.0 NTU, 100% of the time	MIN	0.02	0.02	0.02	0.02	0.03	0.04	0.03
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.03	0.09	0.09	0.15	0.21	0.05	0.06
						AVG	0.03	0.03	0.04	0.04	0.07	0.04	0.04
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	0	0
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #3	≤ 1.0 NTU, 100% of the time	MIN	0.02	0.02	0.03	0.03	0.03	0.03	0.03
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.04	0.08	0.10	0.05	0.21	0.07	0.07
						AVG	0.03	0.03	0.05	0.03	0.09	0.04	0.04
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	0	0
Turbidity Distribution Centre	NTU	Weekly	Grab	Water Distribution Bacteriological Random Locations	N/A	MIN	0.05	0.06	0.05	0.06	0.06	0.05	0.05
						MAX	0.19	0.27	0.18	0.28	0.48	0.32	0.45
						AVG	0.09	0.09	0.07	0.10	0.15	0.10	0.09

NOTE: Aug Max Turbidity of 1.38NTU. AEP Reference # 370005 Notification of water service depressurization at 1 Pacific Ave. Bacteriological sample #1711736 collected with turbidity result of 1.38 NTU. Result of "Absent" for E.coli and Total coliform.

NTU - Nephelometric Turbidity Units

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Turbidity

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Turbidity Raw Water	NTU	Once Per Day	Grab	Raw Water Entering the WTP	N/A	MIN	0.06	0.06	0.05	0.05	0.03	**0.03**
						MAX	0.17	0.17	0.10	0.09	0.34	**0.34**
						AVG	0.09	0.08	0.07	0.07	0.07	**0.08**
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #1	≤ 1.0 NTU, 100% of the time	MIN	0.03	0.03	0.04	0.02	0.02	**0.02**
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.04	0.04	0.08	0.06	0.05	**0.22**
						AVG	0.03	0.03	0.04	0.03	0.03	**0.04**
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	**0**
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #2	≤ 1.0 NTU, 100% of the time	MIN	0.03	0.04	0.04	0.03	0.01	**0.01**
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.04	0.04	0.08	0.05	0.08	**0.21**
						AVG	0.04	0.04	0.05	0.04	0.03	**0.04**
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	**0**
Turbidity Treated Water	NTU	Daily Maiximum	Continuous	Filter Train #3	≤ 1.0 NTU, 100% of the time	MIN	0.03	0.03	0.04	0.03	0.03	**0.02**
					≤ 0.3 NTU, at least 99% of the samples on a daily basis	MAX	0.06	0.04	0.04	0.05	0.05	**0.21**
						AVG	0.04	0.04	0.04	0.04	0.03	**0.04**
					Minutes between 0.3 - 1.0 NTU	Total	0	0	0	0	0	**0**
Turbidity Distribution Centre	NTU	Weekly	Grab	Water Distribution Bacteriological Random Locations	N/A	MIN	0.05	0.05	0.05	0.05	0.02	**0.02**
						MAX	1.38	0.16	0.22	0.21	0.13	**1.38**
						AVG	0.13	0.08	0.08	0.09	0.06	**0.10**

NOTE: Aug Max Turbidity of 1.38NTU. AEP Reference # 370005 Notification of water service depressurization at 1 Pacific Ave. Bacteriological sample #1711736 collected turbidity result of 1.38 NTU. Result of "Absent" for E.coli and Total coliform.

NTU - Nephelometric Turbidity Units

5. Annual Summary - UV Disinfection – Log Reduction of Giardia & Cryptosporidium

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - UV Flow & Transmittance

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 1	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	24.1	51.1	44.7	50.2	50.8	36.4	49.9
						MAX	159.0	148.7	161.0	174.0	188.8	176.3	191.5
						AVG MIN	52.1	52.8	53.5	52.7	60.0	54.7	58.3
						AVG MAX	133.2	128.9	127.0	141.8	152.9	161.1	165.8
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 2	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	24.1	51.1	44.7	50.5	50.8	36.4	49.9
						MAX	159.0	148.7	161.0	174.0	188.8	176.3	191.5
						AVG MIN	52.1	52.8	53.5	52.7	59.9	54.7	58.3
						AVG MAX	133.2	128.9	127.0	141.7	152.9	161.1	165.8
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 3	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	24.1	51.1	44.6	50.5	50.6	36.4	49.9
						MAX	160.5	148.7	161.0	174.0	188.8	176.3	191.5
						AVG MIN	52.0	52.8	53.5	52.7	59.9	54.7	58.2
						AVG MAX	133.3	128.9	127.0	141.5	152.6	159.1	165.5
UV Transmittance	% per cm	Daily	Grab	Entering UV Reactors 1,2 & 3	≥ 70 % per cm	MIN	95.3	96.2	96.4	91.4	86.4	90.5	92.3
						MAX	97.1	98.3	98.8	98.7	96.3	94.4	96.2
						AVG	96.4	96.7	96.9	95.5	90.5	92.3	93.9

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - UV Flow & Transmittance

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 1	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	51.6	47.9	47.2	46.3	47.8	**24.1**
						MAX	237.5	448.4	164.9	156.0	171.8	**448.4**
						AVG MIN	108.5	58.2	50.2	51.9	69.0	**60.2**
						AVG MAX	171.6	173.1	141.0	128.4	125.4	**145.8**
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 2	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	51.6	47.9	47.2	46.3	47.8	**24.1**
						MAX	237.3	237.7	164.9	156.0	154.1	**237.7**
						AVG MIN	106.2	58.2	50.2	51.9	55.7	**58.9**
						AVG MAX	178.0	159.5	141.0	128.3	113.4	**144.2**
UV Flow	m^3/hr	Daily Maximum	Continuous	UV Reactor # 3	≥ 47.3 m^3/hr and ≤ 772 m3/hr	MIN	51.6	48.5	47.2	46.5	48.2	**24.1**
						MAX	237.7	237.2	165.0	156.0	171.8	**237.7**
						AVG MIN	106.4	57.2	50.0	52.3	69.1	**59.9**
						AVG MAX	178.0	165.4	141.0	128.3	125.5	**145.5**
UV Transmittance	% per cm	Daily	Grab	Entering UV Reactors 1,2 & 3	≥ 70 % per cm	MIN	93.9	95.0	96.2	96.3	96.7	**86.4**
						MAX	96.6	97.2	97.6	97.7	98.3	**98.8**
						AVG	95.5	96.4	96.9	97.0	97.2	**95.4**

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - UV Dose

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	40.2	42.2	41.7	40.3	20.1	20.1	19.9
						MAX	51.5	61.5	62.0	53.9	44.2	24.2	24.9
						AVG	47.1	53.3	49.1	47.0	30.9	21.0	21.2
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	47.8	49.9	49.2	49.2	22.0	20.8	21.3
						MAX	53.8	68.6	69.1	65.0	50.7	27.3	26.8
						AVG	52.0	62.7	60.7	58.3	38.1	23.7	24.1
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 2	≥ 18 mJ/cm^2	MIN	40.6	40.7	40.3	32.8	20.1	20.1	20.4
						MAX	53.4	52.2	52.4	42.6	40.6	25.8	29.7
						AVG	46.5	47.1	46.5	39.4	27.3	22.2	21.9
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 2	≥ 18 mJ/cm^2	MIN	53.1	51.3	51.8	43.6	23.3	24.6	24.4
						MAX	61.1	57.4	58.1	53.3	53.8	29.5	31.9
						AVG	56.7	55.3	54.5	48.9	36.7	26.6	27.7
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 3	≥ 18 mJ/cm^2	MIN	39.8	40.0	40.3	40.1	20.1	19.9	20.1
						MAX	41.2	42.2	43.6	43.8	46.5	25.9	24.8
						AVG	40.6	40.8	42.1	41.4	34.1	21.9	21.4
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 3	≥ 18 mJ/cm^2	MIN	41.1	41.3	41.6	41.8	22.1	22.9	22.1
						MAX	48.6	47.7	50.5	49.6	51.3	28.8	26.6
						AVG	45.1	43.0	45.3	45.3	39.2	25.6	24.9

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - UV Dose

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	20.1	19.2	25.0	25.3	25.3	**19.2**
						MAX	42.8	32.3	30.7	30.7	29.9	**62.0**
						AVG	26.9	27.6	26.1	26.3	26.7	**33.6**
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	21.7	28.2	27.7	27.2	26.3	**20.8**
						MAX	44.5	47.3	37.0	40.5	36.5	**69.1**
						AVG	31.8	33.2	30.1	30.2	29.6	**39.5**
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	20.2	25.1	25.3	25.2	25.2	**20.1**
						MAX	34.0	29.8	27.9	28.3	28.1	**53.4**
						AVG	27.0	26.1	26.4	26.3	26.2	**31.9**
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	24.3	29.7	28.1	27.4	25.8	**23.3**
						MAX	36.4	39.2	41.1	47.0	33.2	**61.1**
						AVG	31.9	33.8	31.7	31.3	29.3	**38.7**
UV Dose	mJ/cm^2	Daily Min	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	20.3	25.3	22.6	24.8	25.2	**19.9**
						MAX	34.1	32.1	26.9	27.8	30.7	**46.5**
						AVG	25.4	27.1	25.6	25.9	27.1	**31.1**
UV Dose	mJ/cm^2	Daily Avg	Continuous	UV Reactor # 1	≥ 18 mJ/cm^2	MIN	22.6	27.6	26.3	26.8	27.7	**22.1**
						MAX	35.1	36.7	37.3	36.8	35.9	**51.3**
						AVG	28.0	30.0	28.8	30.3	29.7	**34.6**

6. Annual Summary – Primary Disinfection: CT & Log Removal

CT – NORTH DISTRIBUTION

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Primary Disinfection - Log Reduction of Viruses - CT North Distribution

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
CT required NORTH Distribution	N/A	Once Per Day	Calculated	Entering North Distribution System	N/A	MIN	6	6	9	9	6	6	4
						MAX	6	9	9	9	9	6	6
						AVG	6	8	9	9	8	6	4
CT lowest actual NORTH Distribution	N/A	Once Per Day	Calculated	Entering North Distribution System	N/A	MIN	1398	1385	1346	1232	1184	1359	1440
						MAX	1726	1716	1662	1496	1499	1664	1726
						AVG	1571	1559	1546	1389	1332	1516	1551
CT performance ratio NORTH Distribution	N/A	Once Per Day	Calculated	Entering North Distribution System	≥ 1 except for one day per month, which must be > 0.9	MIN	232.9	163.6	149.5	136.9	142.4	226.5	249.7
						MAX	287.6	258.2	184.7	166.2	249.7	277.3	405.8
						AVG	262.2	184.9	171.9	154.7	182.6	252.6	350.1

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter -Primary Disinfection - Log Reduction of Viruses - CT North Distribution

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
CT required NORTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	N/A	MIN	4	4	4	4	6	**4**
						MAX	4	4	4	6	6	**9**
						AVG	4	4	4	5	6	**6**
CT lowest actual NORTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	N/A	MIN	1426	1440	1412	1387	1374	**1184**
						MAX	1641	1704	1679	1512	1599	**1726**
						AVG	1536	1586	1571	1451	1522	**1511**
CT performance ratio NORTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	≥ 1 except for one day per month, which must be > 0.9	MIN	356.4	360.0	353.0	247.9	110.1	**110.1**
						MAX	410.3	426.0	429.2	375.1	358.2	**429.2**
						AVG	384.9	396.4	393.8	325.2	247.8	**275.6**

CT – SOUTH DISTRIBUTION

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System Water Quality Parameter -Primary Disinfection - Log Reduction of Viruses - CT South Distribtuion														
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
CT required SOUTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	N/A	MIN	6	6	6	6	6	6	4
						MAX	6	6	6	9	6	6	6
						AVG	6	6	6	7	6	6	4
CT lowest actual SOUTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	N/A	MIN	1142	1122	1030	1000	949	1102	1153
						MAX	1357	1418	1316	1204	1204	1316	1387
						AVG	1248	1238	1215	1113	1067	1215	1244
CT performance ratio SOUTH Distribution	N/A	Once Per Day	Calculated	Entering South Distribution System	≥ 1 except for one day per month, which must be > 0.9	MIN	190.4	187.0	171.7	111.1	158.1	183.6	268.6
						MAX	226.1	236.3	219.3	200.6	200.6	219.3	346.8
						AVG	208.2	206.2	202.4	160.8	177.8	202.6	308.8

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Primary Disinfection - Log Reduction of Viruses - CT South Distribtuion

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
CT required				Entering South		MIN	3	4	4	4	4	**3**
SOUTH		Once per	Calculated	Distribution	N/A	MAX	4	4	4	4	6	**9**
Distribution		day		System		AVG	4	4	4	4	5	**5**
CT lowest actual				Entering South		MIN	1244	410	1204	1142	1173	**410**
SOUTH		Once per	Calculated	Distribution	N/A	MAX	1387	1428	1448	1275	1275	**1448**
Distribution		day		System		AVG	1314	1219	1336	1208	1224	**1220**
CT performance ratio				Entering South	≥ 1 except for one day	MIN	311.1	102.6	300.9	285.6	197.2	**102.6**
SOUTH		Once per	Calculated	Distribution	per month, which	MAX	438.6	357.0	362.1	318.9	318.8	**438.6**
Distribution		day		System	must be > 0.9	AVG	335.7	304.7	333.9	302.0	259.7	**250.2**

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Primary Disinfection - Log Reduction of Viruses

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
VOLUME	m^3	Daily Minimum	Continuous	Clearwell	N/A	MIN	804.5	824.0	749.6	762.3	657.7	765.8	731.5
						MAX	875.1	894.2	872.0	862.2	864.7	862.3	908.9
						AVG	859.8	855.5	844.8	849.4	818.7	841.0	828.5
FLOW	MAXIMUM L/min	Once Per Day	Continuous	Entering Distribution System	N/A	MIN	10801	10475	8244	8210	11115	11167	10830
						MAX	12100	12263	12087	14596	15583	14875	16092
						AVG	11344	11362	11255	11808	12322	12049	12630
pH	N/A	Once Per Day	Grab	Entering Distribution System	6.5 - 8.5 pH	MIN	7.4	7.3	7.3	7.1	7.3	7.5	7.5
						MAX	7.6	7.6	7.6	7.7	7.7	7.7	7.7
						AVG	7.5	7.5	7.5	7.5	7.6	7.6	7.6
Temperature	Degrees Celcius	Once Per Day	Grab	Entering Distribution System	N/A	MIN	5.2	4.6	4.2	3.5	3.8	6.6	9.1
						MAX	6.1	5.9	5.4	4.7	6.6	9.0	11.2
						AVG	5.7	5.1	4.8	4.1	5.1	7.7	10.0

Approval # 1029-03-00; Schedule 2A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System
Water Quality Parameter - Primary Disinfection - Log Reduction of Viruses

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
VOLUME	m^3	Daily Minimum	Continuous	Clearwell	N/A	MIN	698.3	774.8	617.9	762.7	695.3	**617.9**
						MAX	826.6	848.1	863.9	869.8	864.0	**908.9**
						AVG	770.0	809.1	820.1	843.9	815.6	**829.7**
FLOW	MAXIMUM L/min	Once Per Day	Continuous	Entering Distribution System	N/A	MIN	11292	10986	11019	8477	8094	**8094**
						MAX	17106	14765	12555	12318	14836	**17106**
						AVG	14477	13084	11630	11276	10794	**12003**
pH	N/A	Once Per Day	Grab	Entering Distribution System	6.5 - 8.5 pH	MIN	7.4	7.5	7.4	7.5	7.4	**7.1**
						MAX	7.6	7.9	7.6	7.7	7.7	**7.9**
						AVG	7.5	7.6	7.6	7.6	7.6	**7.6**
Temperature	Degrees Celcius	Once Per Day	Grab	Entering Distribution System	N/A	MIN	11.3	12.7	11.4	9.0	7.5	**3.5**
						MAX	13.2	13.4	12.9	11.4	9.0	**13.4**
						AVG	12.2	13.1	12.4	10.2	8.3	**8.2**

7. Annual Summary – Distribution Chlorine Residual

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System Water Quality Parameter - Primary Disinfection: Chlorine Residual - Free														
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Free Chlorine Residual	mg/L	Daily Min	Continuous	South Reservoir	≥ 0.2 mg/L	MIN	1.10	1.09	1.00	0.94	0.87	1.01	1.03
						MAX	1.32	1.49	1.23	1.17	1.17	1.46	1.35
						AVG	1.21	1.20	1.16	1.06	1.01	1.16	1.19
Free Chlorine Residual	mg/L	Daily Min	Continuous	Zone 2N Reservoir	≥ 0.2 mg/L	MIN	1.09	1.06	1.03	0.95	0.89	1.01	1.13
						MAX	1.32	1.30	1.24	1.14	1.15	1.25	1.32
						AVG	1.19	1.18	1.18	1.06	1.00	1.15	1.19
Water Quality Parameter - Secondary Disinfection: Chlorine Residual - Free													
Free Chlorine Residual	mg/L	Once per day	Grab	Water Distribution Random Locations	≥ 0.1 mg/L, based on 75% of the samples taken on a particular day	MIN	0.87	0.90	0.83	0.79	0.70	0.63	0.52
						MAX	1.38	1.24	1.22	1.17	1.32	1.45	1.34
						AVG	1.06	1.07	1.06	0.96	0.89	0.96	1.09
Free Chlorine Residual	mg/L	One sample taken with Bacteriological	Grab	Water Distribution Bacteriological Random Locations	≥ 0.1 mg/L, based on 75% of the samples taken on a particular day	MIN	0.79	0.51	0.81	0.73	0.45	0.55	0.52
						MAX	1.25	1.43	1.23	1.24	1.32	1.45	1.25
						AVG	1.07	1.07	1.06	0.95	0.86	0.95	0.97

Approval # 1029-03-00; Schedule 3A - Raw Water & Schedule 3A Treated Water Quality: Monitoring - Town of Okotoks Waterworks System Water Quality Parameter - Primary Disinfection: Chlorine Residual - Free													
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**	**Approval Limit**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Free Chlorine Residual	mg/L	Daily Min	Continuous	South Reservoir	≥ 0.2 mg/L	MIN	1.16	0.35	1.17	1.05	1.14	**0.35**
						MAX	1.33	1.35	1.40	1.24	1.24	**1.49**
						AVG	1.26	1.11	1.28	1.16	1.19	**1.16**
Free Chlorine Residual	mg/L	Daily Min	Continuous	Zone 2N Reservoir	≥ 0.2 mg/L	MIN	1.09	1.08	0.97	1.04	1.07	**0.89**
						MAX	1.30	1.32	1.31	1.16	1.23	**1.32**
						AVG	1.18	1.20	1.20	1.10	1.17	**1.15**
Water Quality Parameter - Secondary Disinfection: Chlorine Residual - Free													
Free Chlorine Residual	mg/L	Once per day	Grab	Water Distribution Random Locations	≥ 0.1 mg/L, based on 75% of the samples taken on a particular day	MIN	0.81	0.81	0.77	0.74	0.79	**0.52**
						MAX	1.25	1.39	1.37	1.18	1.37	**1.45**
						AVG	1.10	1.08	1.14	1.00	1.07	**1.04**
Free Chlorine Residual	mg/L	One sample taken with Bacteriological	Grab	Water Distribution Bacteriological Random Locations	≥ 0.1 mg/L, based on 75% of the samples taken on a particular day	MIN	0.49	0.50	0.63	0.66	0.80	**0.45**
						MAX	1.24	1.30	1.30	1.26	1.28	**1.45**
						AVG	1.01	1.03	1.08	0.99	1.09	**1.01**

8. Annual Summary – Waste Stream Monitoring

A. FILTER WASTE TANK

The filter to waste water was pumped to the sanitary sewer all year except September 22 to October 23, 2020.

Approval # 1029-03-00; Section 4.5.3: Waste Streams Monitoring Program - Town of Okotoks Waterworks System
Filter Waste Monitoring (Samples taken directly from the Filter Backwash Holding Tank)

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
pH	N/A	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbidity	NTU	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Free Chlorine	mg/L	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TSS	mg/L	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOLUME	m^3	Daily	Calculated	FW Tank	N/A	TOTAL	7195	6761	7452	8613	10726	9868	10002

NOTE: Filter to waste water is pumped to the sanitary sewer all year except September 22 to and October 23, 2020.

Approval # 1029-03-00; Section 4.5.3: Waste Streams Monitoring Program - Town of Okotoks Waterworks System
Filter Waste Monitoring (Samples taken directly from the Filter Waste Tank)

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
pH	N/A	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.0	7.8	7.2	0.0	0.0	**7.2**
						MAX	0.0	8.0	7.8	0.0	0.0	**8.0**
						AVG	0.0	7.9	7.6	0.0	0.0	**7.7**
Turbidity	NTU	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.00	0.44	5.88	0.00	0.00	**0.44**
						MAX	0.00	2.08	8.89	0.00	0.00	**8.89**
						AVG	0.00	1.08	7.18	0.00	0.00	**4.13**
Free Chlorine	mg/L	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.00	0.02	0.02	0.00	0.00	**0.02**
						MAX	0.00	0.47	0.04	0.00	0.00	**0.47**
						AVG	0.00	0.13	0.02	0.00	0.00	**0.08**
TSS	mg/L	Once per week	Grab	Filter Waste Holding Tank	N/A	MIN	0.0	2.5	2.5	0.0	0.0	**2.5**
						MAX	0.0	19.0	2.5	0.0	0.0	**19.0**
						AVG	0.0	6.6	2.5	0.0	0.0	**4.6**
VOLUME	m^3	Daily	Calculated	FW Tank	N/A	TOTAL	10070	9651	7333	8132	8291	**104094**

NOTE: Filter to waste water is pumped to the sanitary sewer all year except September 22 to and October 23, 2020.

B. CLARIFIER WASTE TANK

- No clarifier waste for 2020.

Approval # 1029-03-00; Section 4.5.3: Waste Streams Monitoring Program - Town of Okotoks Waterworks System
Clarifier Waste Monitoring (Samples taken directly from the Clarifier Waste Tank)

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
pH	N/A	Once per day	Grab	Clarifier Waste Tank	N/A	MIN							
						MAX							
						AVG							
Turbidity	NTU	Once per day	Grab	Clarifier Waste Tank	N/A	MIN							
						MAX							
						AVG							
TSS	mg/L	Once per week	Grab	Clarifier Waste Tank	N/A	MIN							
						MAX							
						AVG							
VOLUME	m^3	Daily	Calculated	FW Tank	N/A	TOTAL							

NOTE: No clarifier waste for 2020.

Approval # 1029-03-00; Section 4.5.3: Waste Streams Monitoring Program - Town of Okotoks Waterworks System
Clarifier Waste Monitoring (Samples taken directly from the Clarifier Waste Tank)

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
pH	N/A	Once per day	Grab	Clarifier Waste Tank	N/A	MIN						0.0
						MAX						0.0
						AVG						0.0
Turbidity	NTU	Once per day	Grab	Clarifier Waste Tank	N/A	MIN						0.0
						MAX						0.0
						AVG						0.0
TSS	mg/L	Once per week	Grab	Clarifier Waste Tank	N/A	MIN						0.0
						MAX						0.0
						AVG						0.0
VOLUME	m^3	Daily	Calculated	FW Tank	N/A	TOTAL						0.0

NOTE: No clarifier waste for 2020.

9. Annual Summary – Bacteriological Analysis: Water Distribution System

JANUARY 2020										
							E-Coli	Total Coliform		
DATE	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected Bottle #	Present or Absent/100 mL		TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
6-Jan-20	7:21am	pk	pk	200-1118 North Railway Street		1602452	Absent	Absent	0.07	0.79
6-Jan-20	8:10am	pk	pk	51 Drake Landing Loop		1602455	Absent	Absent	0.07	0.92
6-Jan-20	8:30am	pk	pk	40 Crystal Shores Heights		1602454	Absent	Absent	0.06	0.99
6-Jan-20	8:45am	pk	pk	111 Waldren Avenue		1602456	Absent	Absent	0.06	1.02
6-Jan-20	8:15am	ts	ts		22 Southridge Drive	1625649	Absent	Absent	0.06	1.02
6-Jan-20	8:25am	ts	ts		280 Southridge Drive	1602451	Absent	Absent	0.06	0.90
6-Jan-20	8:40am	ts	ts		109-201 Southridge Drive	1625650	Absent	Absent	0.07	1.16
6-Jan-20	8:50am	ts	ts		30 Cimarron Drive	1602453	Absent	Absent	0.05	1.25
13-Jan-20	7:38am	pk	pk	200-1118 North Railway Street		1625646	Absent	Absent	0.15	0.99
13-Jan-20	8:15am	pk	pk	261 Don Seaman Way		1625648	Absent	Absent	0.17	1.18
13-Jan-20	8:40am	pk	pk	51 Drake Landing Loop		1625645	Absent	Absent	0.08	1.25
13-Jan-20	9:05am	pk	pk	111 Waldren Avenue		1625647	Absent	Absent	0.13	1.06
13-Jan-20	8:10am	bs	bs		22 Southridge Drive	1625644	Absent	Absent	0.19	1.14
13-Jan-20	8:20am	bs	bs		280 Southridge Drive	1625642	Absent	Absent	0.18	1.05
13-Jan-20	8:35am	bs	bs		204 Community Way	1625641	Absent	Absent	0.17	1.20
13-Jan-20	8:45am	bs	bs		400 Big Rock Lane	1625643	Absent	Absent	0.12	1.21
20-Jan-20	7:40am	kc	kc	200-1118 North Railway Street		1625635	Absent	Absent	0.15	0.93
20-Jan-20	8:15am	kc	kc	261 Don Seaman Way		1625633	Absent	Absent	0.09	1.10
20-Jan-20	8:45am	kc	kc	51 Drake Landing Loop		1625636	Absent	Absent	0.08	0.99
20-Jan-20	9:03am	kc	kc	99 Okotoks Drive		1625634	Absent	Absent	0.11	1.13
20-Jan-20	10:45am	kc	kc		#212-112 Souuthbank Blvd	1625640	Absent	Absent	0.09	0.91
20-Jan-20	11:05am	kc	kc		280 Southridge Drive	1625638	Absent	Absent	0.07	1.15
20-Jan-20	11:25am	kc	kc		400 Big Rock Lane	1625637	Absent	Absent	0.07	1.23
20-Jan-20	11:35am	kc	kc		22 Southridge Drive	1625639	Absent	Absent	0.08	1.22
27-Jan-20	7:50am	kc	kc	200-1118 NothRailway Street		1625629	Absent	Absent	0.10	1.04
27-Jan-20	8:45am	kc	kc	261 Don Seaman Way		1625627	Absent	Absent	0.05	1.04
27-Jan-20	9:20am	kc	kc	51 Drake Landing Loop		1625626	Absent	Absent	0.06	1.02
27-Jan-20	10:17am	kc	kc	99 Okotoks Drive		1625628	Absent	Absent	0.05	1.06
27-Jan-20	8:35am	ts	ts		30 Cimarron Crescent	1625630	Absent	Absent	0.08	1.11
27-Jan-20	8:50am	ts	ts		22 Southridge Drive	1625631	Absent	Absent	0.08	1.12
27-Jan-20	9:00am	ts	ts		280 Southridge Drive	1625625	Absent	Absent	0.07	1.11
27-Jan-20	9:10am	ts	ts		201-109 Southridge Drive	1625632	Absent	Absent	0.06	1.09
								MINIMUM	0.05	0.79
								MAXIMUM	0.19	1.25
								AVERAGE	0.09	1.07
						TOTAL # OF SAMPLES	32			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

FEBRUARY 2020										
							E-Coli	Total Coliform		
DATE	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	Present or Absent/100 mL		TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
3-Feb-20	7:30am	pk	pk	200-1118 North Railway Street		1625621	Absent	Absent	0.22	0.80
3-Feb-20	7:55am	pk	pk	261 Don Seaman Way		1625618	Absent	Absent	0.09	0.89
3-Feb-20	8:17am	pk	pk	51 Drake Landing Loop		1625624	Absent	Absent	0.08	0.94
3-Feb-20	8:41am	pk	pk	111 Waldren Avenue		1625619	Absent	Absent	0.12	1.18
3-Feb-20	8:40am	kc	kc		112 Southbank Blvd	1625622	Absent	Absent	0.08	0.94
3-Feb-20	9:05am	kc	kc		280 Southridge Drive	1625617	Absent	Absent	0.06	1.02
3-Feb-20	10:10am	kc	kc		400 Big Rock Lane	1625620	Absent	Absent	0.07	0.99
3-Feb-20	10:20am	kc	kc		22 Southridge Drive	1625623	Absent	Absent	0.09	1.05
10-Feb-20	7:15am	bs	bs	200-1118 North Railway Street		1625616	Absent	Absent	0.27	0.80
10-Feb-20	7:34am	bs	bs	261 Don Seaman Way		1625614	Absent	Absent	0.12	1.11
10-Feb-20	7:57am	bs	bs	51 Drake Landing Loop		1625615	Absent	Absent	0.08	0.98
10-Feb-20	8:28am	bs	bs	99 Okotoks Drive		162513	Absent	Absent	0.10	1.08
10-Feb-20	8:05am	ts	ts		22 Southridge Drive	1625611	Absent	Absent	0.06	1.15
10-Feb-20	8:15am	ts	ts		280 Southridge Drive	1625609	Absent	Absent	0.06	1.11
10-Feb-20	8:25am	ts	ts		109-201 Southridge Drive	1625610	Absent	Absent	0.07	1.15
10-Feb-20	8:35am	ts	ts		30 Cimarron Crescent	1625612	Absent	Absent	0.06	1.20
17-Feb-20	8:05am	jb	jb	200 - 1118 North Railway Street		1625603	Absent	Absent	0.14	0.93
17-Feb-20	8:40am	jb	jb	261 Don Seaman Way		1625602	Absent	Absent	0.09	1.17
17-Feb-20	9:00am	jb	jb	51 Drake Landing Loop		1625604	Absent	Absent	0.07	1.11
17-Feb-20	9:35am	jb	jb	50 Elizabeth Street		1625601	Absent	Absent	0.07	1.14
17-Feb-20	8:45am	kc	kc		112 Southbank Blvd	1625606	Absent	Absent	0.09	0.98
17-Feb-20	9:20am	kc	kc		400 Big Rock Lane	1625607	Absent	Absent	0.07	1.40
17-Feb-20	9:45am	kc	kc		22 Southridge Dr	1625608	Absent	Absent	0.06	1.43
17-Feb-20	10:20am	kc	kc		280 Southridge Dr	1625605	Absent	Absent	0.06	1.24
24-Feb-20	7:15am	jb	jb	200 - 1118 North Railway		1602595	Absent	Absent	0.17	0.51
24-Feb-20	8:10am	jb	jb	261 Don Seaman Way		1602596	Absent	Absent	0.07	0.99
24-Feb-20	8:30am	jb	jb	41 Drake Landing Loop		1602598	Absent	Absent	0.08	1.04
24-Feb-20	8:50am	jb	jb	14 Lock Crescent		1602593	Absent	Absent	0.08	1.23
24-Feb-20	8:40am	kc	kc		112 Southbank Blvd	1602594	Absent	Absent	0.07	1.05
24-Feb-20	9:15am	kc	kc		280 Southridge Dr	1602597	Absent	Absent	0.06	1.21
24-Feb-20	9:50am	kc	kc		22 Southridge Sr	1602599	Absent	Absent	0.08	1.23
24-Feb-20	10:00am	kc	kc		400 Big Rock Lane	1602600	Absent	Absent	0.06	1.24
								MINIMUM	0.06	0.51
								MAXIMUM	0.27	1.43
								AVERAGE	0.09	1.07
						TOTAL # OF SAMPLES	32			
Approval	Frequency			Weekly	Weekly	29 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

MARCH 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E-Coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
2/Mar/20	7:30am	bs	bs	200 - 1118 North Railway Street		1602586	Absent	Absent	0.10	1.04
2/Mar/20	8:06am	bs	bs	261 Don Seaman Way		1602589	Absent	Absent	0.06	1.06
2/Mar/20	8:35am	bs	bs	51 Drake Landing Loop		1602587	Absent	Absent	0.06	1.11
2/Mar/20	9:10am	bs	bs	99 Okotoks Drive		1602588	Absent	Absent	0.06	0.97
2/Mar/20	8:26am	kc	kc		112 Southbank Blvd	1602590	Absent	Absent	0.06	0.99
2/Mar/20	8:50am	kc	kc		280 Southridge Drive	1602591	Absent	Absent	0.09	1.12
2/Mar/20	10:20am	kc	kc		22 Southridge Drive	1602585	Absent	Absent	0.08	1.06
2/Mar/20	10:26am	kc	kc		400 Big Rock Lane	1602592	Absent	Absent	0.07	1.19
9/Mar/20	7:22am	bs	bs	200 - 1118 North Railway Street		1602577	Absent	Absent	0.09	1.07
9/Mar/20	8:00am	bs	bs	261 Don Seaman Way		1602582	Absent	Absent	0.06	1.00
9/Mar/20	8:20am	bs	bs	51 Drake Landing Loop		1602578	Absent	Absent	0.07	0.97
9/Mar/20	8:45am	bs	bs	99 Okotoks Drive		1602581	Absent	Absent	0.06	1.09
9/Mar/20	8:25am	kc	kc		212 Southbank Blvd	1602583	Absent	Absent	0.07	1.06
9/Mar/20	9:05am	kc	kc		280 Southridge Drive	1602580	Absent	Absent	0.08	1.14
9/Mar/20	10:20am	kc	kc		22 Southridge Drive	1602584	Absent	Absent	0.06	1.17
9/Mar/20	10:29am	kc	kc		400 Big Rock Lane	1602576	Absent	Absent	0.07	1.23
16/Mar/20	7:15am	bs	bs	200 - 1118 North Railway Street		1627349	Absent	Absent	0.18	1.13
16/Mar/20	7:44am	bs	bs	261 Don Seaman Way		1627347	Absent	Absent	0.05	1.15
16/Mar/20	8:03am	bs	bs	51 Drake Landing Loop		1627346	Absent	Absent	0.08	0.89
16/Mar/20	8:30am	bs	bs	4 Ranchers View		1627348	Absent	Absent	0.05	0.81
16/Mar/20	8:30am	kc	kc		280 Southridge Dr	1627344	Absent	Absent	0.07	1.11
16/Mar/20	10:10am	kc	kc		400 Big Rock Lane	1627343	Absent	Absent	0.07	1.19
16/Mar/20	10:30am	kc	kc		22 Southridge Drive	1627342	Absent	Absent	0.08	1.14
16/Mar/20	11:10am	kc	kc		212 Southbank Blvd	1627345	Absent	Absent	0.07	0.95
23-Mar-20	7:13am	bs	bs	200 - 1118 North Railway Street		1602571	Absent	Absent	0.12	0.96
23-Mar-20	7:41am	bs	bs	261 Don Seaman Way		1602572	Absent	Absent	0.06	1.05
23-Mar-20	8:00am	bs	bs	51 Drake Landing Loop		1602573	Absent	Absent	0.05	1.07
23-Mar-20	8:20am	bs	bs	4 Ranchers View		1602574	Absent	Absent	0.05	1.02
23-Mar-20	8:10am	kc	kc		112 Southbank Blvd	1602568	Absent	Absent	0.08	1.03
23-Mar-20	8:35am	kc	kc		280 Southridge Drive	1602569	Absent	Absent	0.06	1.06
23-Mar-20	9:20am	kc	kc		22 Southridge Drive	1602570	Absent	Absent	0.06	1.20
23-Mar-20	9:35am	kc	kc		400 Big Rock Lane	1602575	Absent	Absent	0.07	1.17
30-Mar-20	7:27am	bs	bs	200 - 1118 North Railway Street		1602567	Absent	Absent	0.07	1.01
30-Mar-20	7:46am	bs	bs	211 Don Seaman Way		1602566	Absent	Absent	0.06	1.06
30-Mar-20	8:08am	bs	bs	51 Drake Landing Loop		1602564	Absent	Absent	0.05	1.10
30-Mar-20	8:25am	bs	bs	4 Ranchers View		1602565	Absent	Absent	0.06	1.00
30-Mar-20	8:45am	kc	kc		109 - 201 Southridge Drive	1602561	Absent	Absent	0.06	1.06
30-Mar-20	9:20am	kc	kc		280 Southridge Drive	1602562	Absent	Absent	0.06	1.06
30-Mar-20	9:50am	kc	kc		22 Southridge Drive	1602563	Absent	Absent	0.06	1.01
30-Mar-20	10:05am	kc	kc		101 Woodhaven Drive	1602560	Absent	Absent	0.05	1.02
								MINIMUM	0.05	0.81
								MAXIMUM	0.18	1.23
								AVERAGE	0.07	1.06
						TOTAL # OF SAMPLES	40			
Approval	Frequency			Weekly	Weekly	29 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

APRIL 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E-Coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
6-Apr-20	7:20am	bs	bs	200-1118 North Railway Street		1602558	Absent	Absent	0.09	0.97
6-Apr-20	7:35am	bs	bs	261 Don Seaman Way		1602554	Absent	Absent	0.07	0.92
6-Apr-20	7:58am	bs	bs	51 Drake Landing Loop		1602556	Absent	Absent	0.08	0.91
6-Apr-20	8:20am	bs	bs	4 Ranchers View		1602559	Absent	Absent	0.08	0.84
6-Apr-20	8:25am	kc	kc		#109-201 Southridge Drive	1602553	Absent	Absent	0.11	1.07
6-Apr-20	9:10am	kc	kc		280 Southridge Drive	1602551	Absent	Absent	0.10	1.02
6-Apr-20	9:25am	kc	kc		204 Community Way	1602552	Absent	Absent	0.09	0.96
6-Apr-20	9:40am	kc	kc		22 Southridge Drive	1602557	Absent	Absent	0.09	1.02
13-Apr-20	7:20am	bs	bs	200-1118 North Railway Street		1627332	Absent	Absent	0.17	0.83
13-Apr-20	7:42am	bs	bs	261 Don Seaman Way		1627335	Absent	Absent	0.07	0.90
13-Apr-20	7:56am	bs	bs	51 Drake Landing Loop		1627333	Absent	Absent	0.18	0.89
13-Apr-20	8:20am	bs	bs	4 Ranchers View		1627334	Absent	Absent	0.06	0.84
13-Apr-20	8:35am	kc	kc		100 Southbank Road	1627338	Absent	Absent	0.28	0.97
13-Apr-20	8:50am	kc	kc		#109-201 Southridge Drive	1627339	Absent	Absent	0.06	1.24
13-Apr-20	9:30am	kc	kc		280 Southridge Drive	1627339	Absent	Absent	0.06	1.03
13-Apr-20	9:45am	kc	kc		22 Southridge Drive	1627336	Absent	Absent	0.06	1.02
20-Apr-20	7:42am	bs	bs	200-1118 North Railway Street		1627324	Absent	Absent	0.23	0.90
20-Apr-20	8:05am	bs	bs	261 Don Seaman Way		1627328	Absent	Absent	0.16	0.96
20-Apr-20	8:25am	bs	bs	51 Drake Landing Loop		1627329	Absent	Absent	0.06	0.96
20-Apr-20	8:45am	bs	bs	4 Ranchers View		1627325	Absent	Absent	0.07	0.81
20-Apr-20	9:22am	bs	bs		101 Woodhaven Drive	1627331	Absent	Absent	0.11	1.06
20-Apr-20	9:17am	dp	dp		280 Southridge Drive	1627339	Absent	Absent	0.10	0.96
20-Apr-20	9:22am	dp	dp		#109-201 Southridge Drive	1627327	Absent	Absent	0.12	1.03
20-Apr-20	9:45am	dp	dp		22 Southridge Drive	1627326	Absent	Absent	0.06	1.06
27-Apr-20	7:20am	pk	pk	200-1118 North Railway Street		1627317	Absent	Absent	0.13	0.73
27-Apr-20	7:30am	pk	pk	261 Don Seaman Way		1627318	Absent	Absent	0.07	0.83
27-Apr-20	8:00am	pk	pk	51 Drake Landing Loop		1627319	Absent	Absent	0.06	1.07
27-Apr-20	8:30am	pk	pk	40 Crystal Shores Heights		1627316	Absent	Absent	0.06	0.82
27-Apr-20	8:25am	ts	ts		22 Southridge Drive	1627322	Absent	Absent	0.06	0.88
27-Apr-20	8:35am	ts	ts		280 Souuthridgeive	1627323	Absent	Absent	0.09	0.90
27-Apr-20	8:50am	ts	ts		109-201 Southridge Drive	1627320	Absent	Absent	0.07	0.93
27-Apr-20	9:05am	ts	ts		30 Cimarron Crescent	1673321	Absent	Absent	0.07	1.01
								MINIMUM	0.06	0.73
								MAXIMUM	0.28	1.24
								AVERAGE	0.10	0.95
						TOTAL # OF SAMPLES	32			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

MAY 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
4-May-20	8:00am	pk	pk		22 Southridge Drive	1627315	Absent	Absent	0.07	1.16
4-May-20	8:30am	pk	pk		280 Southridge Drive	1627313	Absent	Absent	0.06	0.81
4-May-20	9:20am	pk	pk		201 Southridge Drive	1627314	Absent	Absent	0.08	1.06
4-May-20	9:40am	pk	pk		204 Community Way	1627312	Absent	Absent	0.12	0.90
4-May-20	7:25am	bs	bs	200 - 1118 North Railway Street		1627310	Absent	Absent	0.16	0.98
4-May-20	7:47am	bs	bs	261 Don Seaman Way		1627311	Absent	Absent	0.08	0.83
4-May-20	8:15am	bs	bs	51 Drake Landing Loop		1627308	Absent	Absent	0.08	0.74
4-May-20	8:45am	bs	bs	54 Ranch Road		1627309	Absent	Absent	0.08	0.81
7-May-20	4:20pm	pk	pk		132 B Carr Crescent	1711648	Absent	Absent	0.34	0.72
7-May-20	3:39pm	pk	pk		130 Carr Crescent	1711650	Absent	Absent	0.48	0.92
8-May-20	4:00pm	pk	pk		126 Carr Crescent	1446846	Absent	Absent	0.13	0.94
8-May-20	4:10pm	pk	pk		130 Carr Crescent	1446847	Absent	Absent	0.27	0.89
8-May-20	4:20pm	pk	pk		132 B Carr Crescent	1446848	Absent	Absent	0.18	0.73
11-May-20	7:53am	dp	dp		Westmount Booster Station	1625699	Absent	Absent	0.07	0.95
11-May-20	8:18am	dp	dp		280 Southridge Dr	1627307	Absent	Absent	0.15	0.85
11-May-20	9:13am	dp	dp		204 Community Way	1625698	Absent	Absent	0.13	0.83
11-May-20	9:24am	dp	dp		12 Sheep River Drive	1625697	Absent	Absent	0.41	0.94
11-May-20	7:30am	jb	jb	200-1118 North Railway Street		1627305	Absent	Absent	0.27	0.76
11-May-20	8:30am	jb	jb	261 Don Seaman Way		1627306	Absent	Absent	0.12	0.94
11-May-20	8:45am	jb	jb	51 Drake Landing Way		1625696	Absent	Absent	0.08	0.93
11-May-20	9:15am	jb	jb	47 Lock Cresent		1625700	Absent	Absent	0.11	1.32
19-May-20	8:35am	ts	ts		22 Southridge Drive	1625693	Absent	Absent	0.08	0.94
19-May-20	8:45am	ts	ts		280 Southridge Drive	1625692	Absent	Absent	0.21	0.90
19-May-20	8:55am	ts	ts		#109-201 Southridge Drive	1625695	Absent	Absent	0.14	0.92
19-May-20	9:05am	ts	ts		30 Cimarron Crescent	1625694	Absent	Absent	0.15	0.99
19-May-20	12:33pm	pk	pk	200 - 1118 North Railway Street		1625691	Absent	Absent	0.10	0.77
19-May-20	12:52pm	pk	pk	72 Crystal Shores Heights		1625690	Absent	Absent	0.08	0.80
19-May-20	1:05pm	pk	pk	111 Waldren Avenue		1625689	Absent	Absent	0.30	0.79
19-May-20	1:16pm	pk	pk	261 Don Seaman Way		1625688	Absent	Absent	0.22	0.80
25-May-20	7:45am	pk	pk	200-1118 North Railway Street		1625680	Absent	Absent	0.14	0.59
25-May-20	8:10am	pk	pk	261 Don Seaman Way		1625682	Absent	Absent	0.08	0.68
25-May-20	8:27am	pk	pk	51 Drake Landing Loop		1625683	Absent	Absent	0.12	0.60
25-May-20	9:00am	pk	pk	111 Waldren Avenue		1625681	Absent	Absent	0.12	0.70
25-May-20	8:15am	jb	jb		Westmount Booster Station	1625685	Absent	Absent	0.12	0.96
25-May-20	8:30am	jb	jb		280 Southridge Drive	1625684	Absent	Absent	0.09	0.45
25-May-20	9:00am	jb	jb		4- 420 Big Rock Lane	1625687	Absent	Absent	0.09	0.99
25-May-20	9:12am	jb	jb		109- 201 Southridge Drive	1625686	Absent	Absent	0.07	0.98
								MINIMUM	0.06	0.45
								MAXIMUM	0.48	1.32
								AVERAGE	0.15	0.86
						TOTAL # OF SAMPLES	37			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

JUNE 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
1-Jun-20	8:20am	jm	jm		280 Southridge Drive	1625679	Absent	Absent	0.09	0.60
1-Jun-20	8:40am	jm	jm		40 Cimarron Meadows Way	1625678	Absent	Absent	0.07	1.03
1-Jun-20	8:55am	jm	jm		27 Sheep River Drive	1625676	Absent	Absent	0.07	1.03
1-Jun-20	9:10am	jm	jm		17 Sheep River Link	1625677	Absent	Absent	0.07	1.07
1-Jun-20	7:40am	pk	pk	200-1118 North Railway Street		1625675	Absent	Absent	0.18	0.65
1-Jun-20	8:40am	pk	pk	261 Don Seaman Way		1625674	Absent	Absent	0.10	0.71
1-Jun-20	9:00am	pk	pk	51 Drake Landing Loop		1625672	Absent	Absent	0.15	0.98
1-Jun-20	9:35am	pk	pk	111 Waldren Avenue		1625673	Absent	Absent	0.07	0.64
8-Jun-20	7:20am	pk	pk	200 - 1118 North Railway Street		1625670	Absent	Absent	0.21	0.55
8-Jun-20	7:55am	pk	pk	261 Don Seaman Way		1625669	Absent	Absent	0.12	0.81
8-Jun-20	8:40am	pk	pk	51 Drake Landing Loop		1625668	Absent	Absent	0.08	0.97
8-Jun-20	9:15am	pk	pk	40 Crystal Shores Heights		1625671	Absent	Absent	0.11	0.76
8-Jun-20	7:50am	ma	ma		100 Southbank Road	1625667	Absent	Absent	0.06	0.96
8-Jun-20	8:16am	ma	ma		Westmount Booster Station	1625666	Absent	Absent	0.06	0.89
8-Jun-20	8:25am	ma	ma		280 Southridge Drive	1625664	Absent	Absent	0.07	1.03
8-Jun-20	8:40am	ma	ma		12 Sheep River Drive	1625665	Absent	Absent	0.08	1.14
15-Jun-20	7:30am	pk	pk	200-1118 North Railway Street		1625654	Absent	Absent	0.14	0.59
15-Jun-20	7:55am	pk	pk	261 Don Seaman Way		1625655	Absent	Absent	0.06	0.87
15-Jun-20	8:20am	pk	pk	51 Drake Landing Loop		1625656	Absent	Absent	0.07	1.02
15-Jun-20	8:35am	pk	pk	40 Crystal Shores Heights		1625657	Absent	Absent	0.10	0.95
15-Jun-20	7:54am	dp	dp		Westmount Booster Station	1625658	Absent	Absent	0.09	1.10
15-Jun-20	8:23am	dp	dp		280 Southridge Drive	1625659	Absent	Absent	0.06	0.87
15-Jun-20	8:42am	dp	dp		104-109 Southridge Drive	1625660	Absent	Absent	0.06	1.09
15-Jun-20	8:54am	dp	dp		12 Sheep River Drive	1625661	Absent	Absent	0.06	1.16
17-Jun-20	4:55pm	dp	dp		1 Westridge Drive	1711697	Absent	Absent	n/a	0.95
17-Jun-20	4:50pm	bs	bs		5 Westridge Drive	1711695	Absent	Absent	n/a	0.98
17-Jun-20	5:10pm	dp	dp		167 Westridge Close	1711696	Absent	Absent	n/a	1.01
22-Jun-20	7:30am	jab	jab	200-1118 North Railway Street		1711700	Absent	Absent	0.18	0.59
22-Jun-20	8:00am	jab	jab	261 Don Seaman Way		1625651	Absent	Absent	0.08	1.00
22-Jun-20	8:15am	jab	jab	51 Drake Landing Loop		1711699	Absent	Absent	0.05	0.57
22-Jun-20	8:20am	jab	jab	14 Lock Crescent		1711698	Absent	Absent	0.09	1.22
22-Jun-20	8:00am	jm	jm		280 Southridge Drive	1625663	Absent	Absent	0.32	0.81
22-Jun-20	8:10am	jm	jm		Westmount Booster Station	1625662	Absent	Absent	0.09	1.11
22-Jun-20	8:30am	jm	jm		12 Sheep River Drive	1625653	Absent	Absent	0.07	1.18
22-Jun-20	8:40am	jm	jm		40 Cimarron Meadows Way	1625652	Absent	Absent	0.18	1.19
29-Jun-20	7:55am	ma	ma	200-1118 North Railway Street		1711691	Absent	Absent	0.12	0.67
29-Jun-20	8:10am	ma	ma	261 Don Seaman Way		1711693	Absent	Absent	0.15	1.35
29-Jun-20	8:30am	ma	ma	51 Drake Landing Loop		1711690	Absent	Absent	0.09	1.16
29-Jun-20	8:50am	ma	ma	61 Downey Road		1711685	Absent	Absent	0.10	1.45
29-Jun-20	8:01am	bs	bs		12 Sheep River Drive	1711692	Absent	Absent	0.17	1.18
29-Jun-20	8:14am	bs	bs		22 Southridge Drive	1711683	Absent	Absent	0.08	0.98
29-Jun-20	8:30am	bs	bs		280 Southridge Drive	1711684	Absent	Absent	0.07	0.71
29-Jun-20	8:52am	bs	bs		400 Big Rock Lane	1711694	Absent	Absent	0.10	1.18
								MINIMUM	0.05	0.55
								MAXIMUM	0.32	1.45
								AVERAGE	0.10	0.95
						TOTAL # OF SAMPLES	43			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

JULY 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
6-Jul-20	7:30am	pk	pk	200 - 1118 North Railway St		1711681	Absent	Absent	0.18	0.60
6-Jul-20	8:00am	pk	pk	261 Don Seaman Way		1711682	Absent	Absent	0.07	1.06
6-Jul-20	8:20am	pk	pk	51 Drake Landing Loop		1711680	Absent	Absent	0.08	1.13
6-Jul-20	8:40am	pk	pk	40 Crystal Shores Heights		1711686	Absent	Absent	0.07	0.95
6-Jul-20	9:00am	pk	pk		22 Southridge Drive	1711689	Absent	Absent	0.06	1.11
6-Jul-20	7:35am	ma	ma		Westmount Booster Station	1711679	Absent	Absent	0.08	0.97
6-Jul-20	7:50am	ma	ma		280 Southridge Drive	1711687	Absent	Absent	0.06	0.99
6-Jul-20	8:10am	ma	ma		22 Sheep River Drive	1711688	Absent	Absent	0.06	1.23
12-Jul-20	1:15pm	fr	fr	Suntree Place		1664757	Absent	Absent	0.08	1.16
13-Jul-20	7:40am	pk	pk	200-1118 North Railway Street		1711671	Absent	Absent	0.20	0.52
13-Jul-20	9:25am	pk	pk	51 Drake Landing Loop		1711672	Absent	Absent	0.07	1.10
13-Jul-20	9:05am	pk	pk	261 Don Seaman way		1711673	Absent	Absent	0.45	0.97
13-Jul-20	9:40am	pk	pk	40 Crystal Shores Heights		1711674	Absent	Absent	0.06	0.90
13-Jul-20	8:30am	jab	jab		100-112 Southbank Blvd	1711675	Absent	Absent	0.06	1.03
13-Jul-20	8:40am	jab	jab		280 Southridge Drive	1711676	Absent	Absent	0.07	0.69
13-Jul-20	9:00am	jab	jab		Westmount Booster Station	1711677	Absent	Absent	0.14	1.11
13-Jul-20	9:15am	jab	jab		22 Sheep River Drive	1711678	Absent	Absent	0.05	1.25
20-Jul-20	7:40am	ma	ma	200-1118 North Railway Street		1711669	Absent	Absent	0.10	0.72
20-Jul-20	7:55am	ma	ma	260 Don Seaman Way		1711668	Absent	Absent	0.08	0.90
20-Jul-20	8:25am	ma	ma	51 Drake Landing Loop		1711670	Absent	Absent	0.07	1.17
20-Jul-20	8:45am	ma	ma	61 Downey Road		1711667	Absent	Absent	0.07	1.22
20-Jul-20	8:45am	jb	jb		22 Southridge Drive	1711665	Absent	Absent	0.09	1.05
20-Jul-20	9:00am	jb	jb		280 Southridge Drive	1711664	Absent	Absent	0.09	0.87
20-Jul-20	9:20am	jb	jb		62 Cimarron Grove Drive	1711663	Absent	Absent	0.09	0.96
20-Jul-20	9:45am	jb	jb		1 Sheep River Crescent	1711666	Absent	Absent	0.09	1.06
27-Jul-20	8:03am	pk	pk	200-1118 North Railway Street		1711659	Absent	Absent	0.10	0.69
27-Jul-20	8:03am	pk	pk	261 Don Seaman Way		1711661	Absent	Absent	0.06	1.09
27-Jul-20	8:03am	pk	pk	51 Drake Landing Loop		1711660	Absent	Absent	0.09	0.70
27-Jul-20	8:03am	pk	pk	40 Crystal Shores Heights		1711662	Absent	Absent	0.09	0.90
27-Jul-20	8:06am	dp	dp		Westmount Booster Station	1711655	Absent	Absent	0.08	1.02
27-Jul-20	8:29am	dp	dp		280 Southridge Drive	1711658	Absent	Absent	0.07	0.72
27-Jul-20	9:01am	dp	dp		204 Community Way	1711657	Absent	Absent	0.05	0.87
27-Jul-20	9:21am	dp	dp		12 Sheep River Drive	1711656	Absent	Absent	0.07	1.18
								MINIMUM	0.05	0.52
								MAXIMUM	0.45	1.25
								AVERAGE	0.09	0.97
						TOTAL # OF SAMPLES	33			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

AUGUST 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
3-Aug-20	7:30am	bs	bs	200-1118 North Railway Street		1711750	Absent	Absent	0.15	0.60
3-Aug-20	7:45am	bs	bs	261 Don Seaman Way		1711749	Absent	Absent	0.07	1.09
3-Aug-20	8:19am	bs	bs	51 Drake Landing Loop		1711748	Absent	Absent	0.07	1.07
3-Aug-20	8:36am	bs	bs	103 Thorson Crescent		1711747	Absent	Absent	0.08	1.04
3-Aug-20	8:20am	jb	jb		109-201 Southriodge Drive	1711654	Absent	Absent	0.08	0.87
3-Aug-20	8:38am	jb	jb		280 Souhridge Drive	1711652	Absent	Absent	0.10	0.69
3-Aug-20	8:52am	jb	jb		Westmount Booster Station	1711651	Absent	Absent	0.07	1.18
3-Aug-20	9:13am	jb	jb		12 Sheep River Drive	1711653	Absent	Absent	0.15	1.17
7-Aug-20	3:19pm	bs	bs	33 Knight Street		1711738	Absent	Absent	0.24	1.24
7-Aug-20	3:31pm	bs	bs	10 Crescent Road East		1711737	Absent	Absent	0.25	1.18
7-Aug-20	4:05pm	bs	bs	1 Pacific Avenue		1711736	Absent	Absent	1.38	1.19
10-Aug-20	8:15am	pw	pw		18 Sheep River Cove	1711745	Absent	Absent	0.07	1.13
10-Aug-20	9:10am	pw	pw		31 Cimarron Meadows Way	1711744	Absent	Absent	0.07	1.18
10-Aug-20	8:30am	pw	pw		12 Sheep River Drive	1711746	Absent	Absent	0.14	1.17
10-Aug-20	8:45am	pw	pw		Westmount Booster Station	1711743	Absent	Absent	0.15	1.17
10-Aug-20	7:45am	ma	ma	51 Drake Landing Loop		1711742	Absent	Absent	0.06	0.91
10-Aug-20	8:10am	ma	ma	61 Downey Road		1711741	Absent	Absent	0.05	1.23
10-Aug-20	8:25am	ma	ma	261 Don Seaman Way		1711739	Absent	Absent	0.08	1.11
10-Aug-20	8:35am	ma	ma	200-1118 North Railway Street		1711740	Absent	Absent	0.08	0.49
17-Aug-20	8:25am	jb	jb		100 Southbank Road	1711728	Absent	Absent	0.07	0.92
17-Aug-20	8:45am	jb	jb		280 Southridge Drive	1711730	Absent	Absent	0.07	1.13
17-Aug-20	9:00am	jb	jb		60 Cimarron Grove Drive	1711729	Absent	Absent	0.16	1.15
17-Aug-20	9:13am	jb	jb		22 Southridge Drive	1711731	Absent	Absent	0.08	1.13
17-Aug-20	7:50am	pk	pk	200-1118 North Railway Street		1711734	Absent	Absent	0.15	0.50
17-Aug-20	8:35am	pk	pk	261 Don Seaman Way		1711735	Absent	Absent	0.10	1.16
17-Aug-20	9:00am	pk	pk	51 Drake Landing Loop		1711733	Absent	Absent	0.13	0.85
17-Aug-20	9:20am	pk	pk	40 Crystal Shores Heights		1711732	Absent	Absent	0.15	0.98
24-Aug-20	9:55am	ts	ts		12 Sheep River Drive	1711719	Absent	Absent	0.08	1.17
24-Aug-20	10:10am	ts	ts		30 Cimarron Crescent	1711720	Absent	Absent	0.07	1.13
24-Aug-20	10:10am	pk	pk		280 Southridge Drive	1711721	Absent	Absent	0.06	0.88
24-Aug-20	9:55am	pk	pk		Westmount Booster	1711722	Absent	Absent	0.10	0.90
24-Aug-20	9:00am	pk	pk	40 Crystal Shores Heights		1711723	Absent	Absent	0.07	0.90
24-Aug-20	8:45am	pk	pk	51 Drake Landing Loop		1711724	Absent	Absent	0.09	1.10
24-Aug-20	8:30am	pk	pk	261 Don Seaman Way		1711726	Absent	Absent	0.06	0.96
24-Aug-20	7:57am	pk	pk	200-1118 North Railway Street		1711727	Absent	Absent	0.10	1.00
31-Aug-20	7:18am	bs	bs	200-1118 North Railway Street		1711718	Absent	Absent	0.09	0.94
31-Aug-20	7:39am	bs	bs	261 Don Seaman Way		1711712	Absent	Absent	0.06	0.90
31-Aug-20	7:58am	bs	bs	51 Drake Landing Loop		1711713	Absent	Absent	0.07	0.85
31-Aug-20	8:35am	bs	bs	4 Ranchers View		1711716	Absent	Absent	0.07	0.72
31-Aug-20	7:45am	pk	pk		12 Sheep River Drive	1711717	Absent	Absent	0.12	1.05
31-Aug-20	7:55am	pk	pk		Westmount Booster	1711714	Absent	Absent	0.09	1.15
31-Aug-20	8:10am	pk	pk		280 Southridge Drive	7144711	Absent	Absent	0.10	0.99
31-Aug-20	9:15am	pk	pk		100 Southbank Road	1711715	Absent	Absent	0.06	1.06
								MINIMUM	0.05	0.49
								MAXIMUM	1.38	1.24
								AVERAGE	0.13	1.01
						TOTAL # OF SAMPLES	43			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

SEPTEMBER 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
8-Sep-20	8:13am	bs	bs		12 Sheep River Drive	1711710	Absent	Absent	0.08	1.18
8-Sep-20	8:20am	bs	bs		22 Westridge Drive	1711703	Absent	Absent	0.05	1.18
8-Sep-20	8:34am	bs	bs		Westmount Booster Station	1711702	Absent	Absent	0.06	1.03
8-Sep-20	8:45am	bs	bs		280 Southridge Drive	1171704	Absent	Absent	0.06	0.78
8-Sep-20	7:30am	pk	pk	200-1118 North Railway Street		1711708	Absent	Absent	0.12	0.50
8-Sep-20	8:00am	pk	pk	261 Don Seaman Way		1711706	Absent	Absent	0.06	1.05
8-Sep-20	8:15am	pk	pk	51 Drake Landing Loop		1711705	Absent	Absent	0.07	1.16
8-Sep-20	8:40am	pk	pk	40 Crystal Shores Heights		1711707	Absent	Absent	0.06	0.90
14-Sep-20	7:30am	pk	pk	200 - 1118 North Railway Street		1711797	Absent	Absent	0.12	0.90
14-Sep-20	8:15am	pk	pk	261 Don Seaman Way		1711800	Absent	Absent	0.06	1.10
14-Sep-20	8:45am	pk	pk	51 Drake Landing Loop		1711798	Absent	Absent	0.05	1.21
14-Sep-20	9:00am	pk	pk	40 Crystal Shores Heights		1711796	Absent	Absent	0.05	1.05
14-Sep-20	8:50am	pw	pw		280 Southridge Drive	1711795	Absent	Absent	0.07	1.03
14-Sep-20	9:00am	pw	pw		Westmount Booster Station	1711799	Absent	Absent	0.07	1.21
14-Sep-20	9:11am	pw	pw		12 Sheep River Drive	1711794	Absent	Absent	0.06	1.23
14-Sep-20	9:30am	pw	pw		18 Sheep River Cove	1711793	Absent	Absent	0.07	1.17
14-Sep-20	8:30am	pw	pw		Southbank Lift Station (test sample)	1711792	Absent	Absent	N/A	0.76
21-Sep-20	7:48am	dp	dp	200-1118 North Railway Street		1711786	Absent	Absent	0.16	0.71
21-Sep-20	8:24am	dp	dp	261 Don Seaman Way		1711787	Absent	Absent	0.10	0.97
21-Sep-20	8:38am	dp	dp	51 Drake Landing Loop		1711788	Absent	Absent	0.06	1.11
21-Sep-20	8:54am	dp	dp	300 Downey Place		1711789	Absent	Absent	0.07	1.10
21-Sep-20	10:00am	pk	pk		100 Southbank Blvd	1711791	Failed	Absent	0.07	1.06
21-Sep-20	9:20am	pk	pk		280 Southridge Drive	1711790	Absent	Absent	0.07	1.11
21-Sep-20	8:20am	pk	pk		12 Sheep River Drive	1711785	Absent	Absent	0.09	1.30
21-Sep-20	8:52am	pk	pk		22 Southridge Drive	1711784	Absent	Absent	0.06	1.16
24-Sep-20	7:50am	pk	pk	RESAMPLE REF # 371952	100 Southbank Blvd	1446843	Absent	Absent	0.07	1.18
24-Sep-20	8:10am	pk	pk		Southbank Lift Station	1446845	Absent	Absent	0.12	0.96
24-Sep-20	8:30am	pk	pk		#400 100 Southbank Road	1446842	Absent	Absent	0.09	1.18
24-Sep-20	8:50am	pk	pk		#304 100 Southbank Road	1446840	Absent	Absent	0.05	1.09
24-Sep-20	9:15am	pk	pk		#10 101 Southbank Boulevard	1446839	Absent	Absent	0.06	0.97
28-Sep-20	7:20am	pk	pk	200-1118 North Railway Street		1711783	Absent	Absent	0.13	0.85
28-Sep-20	7:50am	pk	pk	261 Don Seaman Way		1711782	Absent	Absent	0.06	1.12
28-Sep-20	8:05am	pk	pk	51 Drake Landing Loop		1711781	Absent	Absent	0.07	1.27
28-Sep-20	8:20am	pk	pk	40 Crystal Shores Heights		1711780	Absent	Absent	0.05	1.04
28-Sep-20	9:30am	pk	pk		12 Sheep River Drive	1711778	Absent	Absent	0.08	1.04
28-Sep-20	9:45am	pk	pk		280 Southridge Drive	1711776	Absent	Absent	0.08	0.80
28-Sep-20	10:00am	pk	pk		109-210 Southridge Drive	1711779	Absent	Absent	0.08	0.81
28-Sep-20	10:15am	pk	pk		#400 100 Southbank Road	1711777	Absent	Absent	0.06	0.74
								MINIMUM	0.05	0.50
								MAXIMUM	0.16	1.30
								AVERAGE	0.08	1.03
						TOTAL # OF SAMPLES	37			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

OCTOBER 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
5-Oct-20	8:00am	jb	jb	200-1118 North Railway Street		1711774	Absent	Absent	0.22	0.96
5-Oct-20	8:22am	jb	jb	261 Don Seaman Way		1711771	Absent	Absent	0.07	1.24
5-Oct-20	8:40am	jb	jb	51 Drake Landing Loop		1711773	Absent	Absent	0.05	1.28
5-Oct-20	9:05am	jb	jb	47 Lock Crescent		1711775	Absent	Absent	0.06	1.30
5-Oct-20	7:51am	bs	bs		12 Sheep River Drive	1711772	Absent	Absent	0.07	1.27
5-Oct-20	8:05am	bs	bs		22 Southridge Drive	1711770	Absent	Absent	0.07	1.24
5-Oct-20	8:28am	bs	bs		280 Southridge Drive	1711769	Absent	Absent	0.08	0.78
5-Oct-20	8:15am	bs	bs		Westmount Booster Station	1711768	Absent	Absent	0.07	1.18
13-Oct-20	7:29am	pk	pk	200-1118 North Railway Street		1711762	Absent	Absent	0.11	0.63
13-Oct-20	7:52am	pk	pk	261 Don Seaman Way		1711763	Absent	Absent	0.09	1.08
13-Oct-20	8:05am	pk	pk	51 Drake Landing Loop		1711760	Absent	Absent	0.08	0.96
13-Oct-20	8:20am	pk	pk	40 Crystal Shores HTS		1711761	Absent	Absent	0.06	1.00
13-Oct-20	9:25am	pk	pk		12 Sheep River Drive	1711764	Absent	Absent	0.06	1.22
13-Oct-20	9:45am	pk	pk		22 Southridge Drive	1711765	Absent	Absent	0.08	1.13
13-Oct-20	10:00am	pk	pk		280 Southridge Drive	1711766	Absent	Absent	0.06	1.07
13-Oct-20	10:15am	pk	pk		109-201 Southridge Drive	1711767	Absent	Absent	0.08	1.17
19-Oct-20	7:40am	pk	pk	200 - 1118 North Railway Street		1711758	Absent	Absent	0.16	0.77
19-Oct-20	8:30am	pk	pk	261 Don Seaman Way		1711753	Absent	Absent	0.08	1.10
19-Oct-20	9:10am	pk	pk	51 Drake Landing Loop		1711752	Absent	Absent	0.06	1.15
19-Oct-20	9:20am	pk	pk	40 Crystal Shores Hts		1711754	Absent	Absent	0.06	1.09
19-Oct-20	8:00am	ma	ma		100 Southbank Road	1711757	Absent	Absent	0.06	1.15
19-Oct-20	8:21am	ma	ma		Westmount Booster Station	1711756	Absent	Absent	0.08	1.25
19-Oct-20	8:35am	ma	ma		280 Southridge Drive	1711759	Absent	Absent	0.06	1.16
19-Oct-20	8:55am	ma	ma		22 Sheep River Drive	1711755	Absent	Absent	0.06	1.23
26-Oct-20	7:20am	bs	bs	200-1118 Northrailway Street		1694093	Absent	Absent	0.18	0.83
26-Oct-20	7:35am	bs	bs	261 Don Seaman Way		1694094	Absent	Absent	0.05	1.02
26-Oct-20	8:00am	bs	bs	51 Drake Landing Loop		1694095	Absent	Absent	0.06	0.96
26-Oct-20	8:21am	bs	bs	4 ranchers View		1694096	Absent	Absent	0.05	0.91
26-Oct-20	9:30am	pk	pk		109-201 Southridge Dr	1694097	Absent	Absent	0.06	1.08
26-Oct-20	9:20am	pk	pk		280 Southridge Dr	1694098	Absent	Absent	0.06	1.07
26-Oct-20	8:05am	pk	pk		12 Sheep River Dr	1694099	Absent	Absent	0.05	1.10
26-Oct-20	8:45am	pk	pk		22 Southridge Dr	1694100	Absent	Absent	0.06	1.11
								MINIMUM	0.05	0.63
								MAXIMUM	0.22	1.30
								AVERAGE	0.08	1.08
						TOTAL # OF SAMPLES	32			
	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Approval	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L
Requirements										

NOVEMBER 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
2-Nov-20	7:48am	dp	dp	200-1118 North Railway Street		1694088	Absent	Absent	0.07	0.68
2-Nov-20	8:16am	dp	dp	261 Don Seaman Way		1694085	Absent	Absent	0.05	1.01
2-Nov-20	8:34am	dp	dp	51 Drake Landing Loop		1694087	Absent	Absent	0.06	1.03
2-Nov-20	8:58am	dp	dp	300 Downey Place		1694086	Absent	Absent	0.18	0.90
2-Nov-20	8:11am	bs	bs		12 Sheep River Drive	1694092	Absent	Absent	0.06	1.10
2-Nov-20	8:22am	bs	bs		22 Southridge Drive	1694089	Absent	Absent	0.06	1.06
2-Nov-20	8:38am	bs	bs		Westmount Booster Station	1694090	Absent	Absent	0.07	1.10
2-Nov-20	8:50am	bs	bs		28 Southridge Drive	1694091	Absent	Absent	0.10	1.03
9-Nov-20	7:30am	pk	pk	200-1118 North Railway Street		1694080	Absent	Absent	0.07	0.66
9-Nov-20	8:15am	pk	pk	261 Don Seaman Way		1694079	Absent	Absent	0.09	0.94
9-Nov-20	8:30am	pk	pk	51 Drake Landing Loop		1694078	Absent	Absent	0.06	1.14
9-Nov-20	8:50am	pk	pk	40 Crystal Shores Heights		1694077	Absent	Absent	0.14	1.11
9-Nov-20	7:39am	dp	dp		Southbank Lift Station	1694083	Absent	Absent	0.06	0.69
9-Nov-20	8:01am	dp	dp		Westmount Booster Station	1694082	Absent	Absent	0.07	1.00
9-Nov-20	8:15am	dp	dp		280 Southridge Drive	1694084	Absent	Absent	0.07	0.93
9-Nov-20	8:37am	dp	dp		12 Sheep River Drive	1694081	Absent	Absent	0.11	1.01
16-Nov-20	8:10am	pk	pk		12 Sheep River Drive	1694070	Absent	Absent	0.08	1.26
16-Nov-20	8:24am	pk	pk		22 Southridge Drive	1694072	Absent	Absent	0.06	1.15
16-Nov-20	8:45am	pk	pk		280 Southridge Drive	1694071	Absent	Absent	0.07	1.05
16-Nov-20	9:00am	pk	pk		104-201 Southridge Drive	1694069	Absent	Absent	0.07	1.11
16-Nov-20	7:25am	bs	bs	200 - 1118 North Railway St		1694074	Absent	Absent	0.21	0.87
16-Nov-20	7:40am	bs	bs	261 Don Seaman Way		1694073	Absent	Absent	0.05	0.88
16-Nov-20	8:00am	bs	bs	51 Drake Landing Loop		1694075	Absent	Absent	0.06	0.94
16-Nov-20	8:25am	bs	bs	4 Ranchers View		1694076	Absent	Absent	0.06	0.82
23-Nov-20	7:30am	pk	pk	200-1118 North Railway Street		1694057	Absent	Absent	0.06	0.70
23-Nov-20	7:40am	pk	pk	261 Don Seaman Way		1694056	Absent	Absent	0.13	1.14
23-Nov-20	8:10am	pk	pk	51 Drake landing Loop		1694055	Absent	Absent	0.08	0.92
23-Nov-20	8:40am	pk	pk	40 Crystal Shores Hts		1694054	Absent	Absent	0.08	1.05
23-Nov-20	7:53am	bs	bs		12 Sheep River Drive	1711751	Absent	Absent	0.12	1.14
23-Nov-20	8:05am	bs	bs		22 Southridge Drive	1694051	Absent	Absent	0.06	1.12
23-Nov-20	8:12am	bs	bs		Westmount Booster Station	1694052	Absent	Absent	0.11	1.23
23-Nov-20	8:25am	bs	bs		280 Southridge Drive	1694053	Absent	Absent	0.15	1.06
30-Nov-20	7:25am	ma	ma	200-1118 North Railway Street		1694058	Absent	Absent	0.15	0.72
30-Nov-20	7:45am	ma	ma	261 Don Seaman Way		1694059	Absent	Absent	0.07	0.93
30-Nov-20	8:05am	ma	ma	51 Drake landing Loop		1694061	Absent	Absent	0.06	1.09
30-Nov-20	9:06am	ma	ma	61 Downey Road		1694060	Absent	Absent	0.07	1.18
30-Nov-20	7:48am	dp	dp		Southbank Lift Station	1694062	Absent	Absent	0.11	0.78
30-Nov-20	8:03am	dp	dp		Westmount Booster Station	1694064	Absent	Absent	0.19	1.03
30-Nov-20	8:16am	dp	dp		280 Southridge Drive	1694065	Absent	Absent	0.07	0.98
30-Nov-20	8:26am	dp	dp		12 Sheep River Drive	1694063	Absent	Absent	0.08	1.06
								MINIMUM	0.05	0.66
								MAXIMUM	0.21	1.26
								AVERAGE	0.09	0.99
						TOTAL # OF SAMPLES	40			
Approval	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
Requirements	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L

DECEMBER 2020

DAY	TIME	Sampled By	Tested By	North Location	South Location	Bacti Sample Collected	*E. coli* Present or Absent/100 mL	Total Coliform Present or Absent/100 mL	TURBIDITY (NTU)	FREE CHLORINE RESIDUAL (mg/L)
7-Dec-20	7:22am	pk	pk	200-1118 North Railway Street		1694067	Absent	Absent	0.07	1.07
7-Dec-20	7:47am	pk	pk	261 Don Seaman Way		1694068	Absent	Absent	0.06	0.96
7-Dec-20	7:50am	pk	pk	51 Drake Landing Loop		1680650	Absent	Absent	0.06	1.04
7-Dec-20	8:20am	pk	pk	40 Crystal Shores Heights		1694066	Absent	Absent	0.08	1.04
7-Dec-20	7:31am	dp	dp		Southbank Lift Station	1680648	Absent	Absent	0.08	0.80
7-Dec-20	7:50am	dp	dp		Westmount Lift Station	1680649	Absent	Absent	0.13	1.16
7-Dec-20	8:04am	dp	dp		280 Southridge Drive	1680647	Absent	Absent	0.06	1.12
7-Dec-20	8:18am	dp	dp		12 Sheep River Drive	1680646	Absent	Absent	0.06	1.24
14-Dec-20	8:15am	pk	pk	261 Don Seaman		1680643	Absent	Absent	0.08	0.92
14-Dec-20	8:40am	pk	pk	51 Drake Landing Loop		1680644	Absent	Absent	0.06	1.17
14-Dec-20	8:55am	pk	pk	40 Crystal Shores Heights		1680645	Absent	Absent	0.07	1.10
14-Dec-20	7:25am	pk	pk	200-1118 North Railway Street		1680638	Absent	Absent	0.07	1.08
14-Dec-20	7:59am	dp	dp		Westmount Booster Station	1680642	Absent	Absent	0.07	1.03
14-Dec-20	8:10am	dp	dp		280 Southridge Drive	1680641	Absent	Absent	0.06	1.23
14-Dec-20	8:25am	dp	dp		12 Sheep River Drive	1680640	Absent	Absent	0.07	1.28
14-Dec-20	9:19am	dp	dp		4 Sheep River Link	1680639	Absent	Absent	0.09	1.11
21-Dec-20	7:15am	pw	pw	111 Waldron Avenue		1680637	Absent	Absent	0.08	1.08
21-Dec-20	7:45am	pw	pw	69 Okotoks Drive		1680633	Absent	Absent	0.06	1.17
21-Dec-20	8:15am	pw	pw	51 Drake Landing Loop		1680634	Absent	Absent	0.08	1.11
21-Dec-20	8:35am	pw	pw	261 Don Seaman Way		1680636	Absent	Absent	0.06	1.06
21-Dec-20	7:35am	ma	ma		Southbank Lift Station	1680632	Absent	Absent	0.06	0.84
21-Dec-20	8:00am	ma	ma		Westmount Booster Station	1680631	Absent	Absent	0.06	1.15
21-Dec-20	8:10am	ma	ma		280 Southridge Drive	1680635	Absent	Absent	0.05	1.08
21-Dec-20	8:35am	ma	ma		12 Sheep River Drive	1680630	Absent	Absent	0.07	1.11
29-Dec-20	7:30am	pw	pw	261 Don Seaman Way		1680626	Absent	Absent	0.05	1.04
29-Dec-20	7:55am	pw	pw	51 Drake Landing Loop		1680629	Absent	Absent	0.02	1.08
29-Dec-20	8:15am	pw	pw	111 Waldron Ave		1680628	Absent	Absent	0.03	1.08
29-Dec-20	8:30am	pw	pw	69 Okotoks Drive		1680627	Absent	Absent	0.08	1.23
29-Dec-20	8:20am	bs	bs		12 Sheep River Drive	1680623	Absent	Absent	0.03	1.20
29-Dec-20	9:34am	bs	bs		280 Southridge Drive	1680625	Absent	Absent	0.04	1.06
29-Dec-20	8:30am	ma	ma		101 Woodhouse Road	1680621	Absent	Absent	0.03	1.16
29-Dec-20	8:40am	ma	ma		18 Sheep River Cove	1680622	Absent	Absent	0.08	1.18
								MINIMUM	0.02	0.80
								MAXIMUM	0.13	1.28
								AVERAGE	0.06	1.09
						TOTAL # OF SAMPLES	32			
	Frequency			Weekly	Weekly	30 Samples per Month			Weekly	Daily
	Limit			Random	Random	Random			≤ 5 NTU	≥0.1 mg/L
Approval										
Requirements										

10. Annual Results – Total Trihalomethanes (THM's) and (HAA's)

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0010432
PROJECT	THM/HAA	**REPORTED**	2020-01-14 16:26

Analyte	Result	RL	Units	Analyzed	Qualifier
101 Woodhaven Drive - Enter DS (0010432-01) | Matrix: Water | Sampled: 2020-01-08 08:00					
Calculated Parameters					
Total Trihalomethanes	**0.0116**	0.00400	mg/L	N/A	
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Dichloroacetic Acid	**0.0032**	0.0020	mg/L	2020-01-12	
Trichloroacetic Acid	**0.0036**	0.0020	mg/L	2020-01-12	
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Total Haloacetic Acids (HAA5)	**0.00676**	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*106*	*70-130*	%	*2020-01-12*	
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0017**	0.0010	mg/L	2020-01-12	
Bromoform	< 0.0010	0.0010	mg/L	2020-01-12	
Chloroform	**0.0099**	0.0010	mg/L	2020-01-12	
Dibromochloromethane	< 0.0010	0.0010	mg/L	2020-01-12	
Surrogate: Toluene-d8	*89*	*70-130*	%	*2020-01-12*	
Surrogate: 4-Bromofluorobenzene	*88*	*70-130*	%	*2020-01-12*	
14 Lock Cres - Random North (0010432-02) | Matrix: Water | Sampled: 2020-01-08 08:30					
Calculated Parameters					
Total Trihalomethanes	**0.0118**	0.00400	mg/L	N/A	
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Dichloroacetic Acid	**0.0033**	0.0020	mg/L	2020-01-12	
Trichloroacetic Acid	**0.0037**	0.0020	mg/L	2020-01-12	
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12	
Total Haloacetic Acids (HAA5)	**0.00694**	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*107*	*70-130*	%	*2020-01-12*	
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0017**	0.0010	mg/L	2020-01-12	
Bromoform	< 0.0010	0.0010	mg/L	2020-01-12	
Chloroform	**0.0101**	0.0010	mg/L	2020-01-12	
Dibromochloromethane	< 0.0010	0.0010	mg/L	2020-01-12	
Surrogate: Toluene-d8	*87*	*70-130*	%	*2020-01-12*	
Surrogate: 4-Bromofluorobenzene	*86*	*70-130*	%	*2020-01-12*	

21 chinook Arch Way - Ext End (0010432-03) | Matrix: Water | Sampled: 2020-01-08 08:45, Continued

Calculated Parameters				
Total Trihalomethanes	**0.0213**	0.00400	mg/L	N/A
Haloacetic Acids				
Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12
Dichloroacetic Acid	**0.0085**	0.0020	mg/L	2020-01-12
Trichloroacetic Acid	**0.0061**	0.0020	mg/L	2020-01-12
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-12
Total Haloacetic Acids (HAA5)	**0.0145**	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*106*	*70-130*	%	*2020-01-12*
Volatile Organic Compounds (VOC)				
Bromodichloromethane	**0.0026**	0.0010	mg/L	2020-01-12
Bromoform	< 0.0010	0.0010	mg/L	2020-01-12
Chloroform	**0.0187**	0.0010	mg/L	2020-01-12
Dibromochloromethane	< 0.0010	0.0010	mg/L	2020-01-12
Surrogate: Toluene-d8	*88*	*70-130*	%	*2020-01-12*
Surrogate: 4-Bromofluorobenzene	*87*	*70-130*	%	*2020-01-12*

30 Cimarron Cres - Random S (0010432-04) | Matrix: Water | Sampled: 2020-01-08 08:15

Calculated Parameters				
Total Trihalomethanes	**0.0117**	0.00400	mg/L	N/A
Haloacetic Acids				
Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2020-01-13
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-13
Dichloroacetic Acid	**0.0033**	0.0020	mg/L	2020-01-13
Trichloroacetic Acid	**0.0034**	0.0020	mg/L	2020-01-13
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2020-01-13
Total Haloacetic Acids (HAA5)	**0.00673**	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*108*	*70-130*	%	*2020-01-13*
Volatile Organic Compounds (VOC)				
Bromodichloromethane	**0.0017**	0.0010	mg/L	2020-01-12
Bromoform	< 0.0010	0.0010	mg/L	2020-01-12
Chloroform	**0.0100**	0.0010	mg/L	2020-01-12
Dibromochloromethane	< 0.0010	0.0010	mg/L	2020-01-12
Surrogate: Toluene-d8	*87*	*70-130*	%	*2020-01-12*
Surrogate: 4-Bromofluorobenzene	*86*	*70-130*	%	*2020-01-12*

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0010432
PROJECT	THM/HAA	**REPORTED**	2020-01-14 16:26

Analysis Description	Method Ref.	Technique	Location
Haloacetic Acids in Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	Richmond
Trihalomethanes in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
EPA	United States Environmental Protection Agency Test Methods

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:sgulenchyn@caro.ca

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0050686
PROJECT	THM/HAA	**REPORTED**	2020-05-20 09:53

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
101 Woodhaven Drive (0050686-01) | Matrix: Water | Sampled: 2020-05-06 07:30						
Calculated Parameters						
Total Trihalomethanes	**0.0263**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Dichloroacetic Acid	**0.0111**	N/A	0.0020	mg/L	2020-05-19	
Trichloroacetic Acid	**0.0129**	N/A	0.0020	mg/L	2020-05-19	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Total Haloacetic Acids (HAA5)	**0.0240**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*98*		*70-130*	%	*2020-05-19*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0019**	N/A	0.0010	mg/L	2020-05-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-05-13	
Chloroform	**0.0243**	N/A	0.0010	mg/L	2020-05-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-05-13	
Surrogate: Toluene-d8	*106*		*70-130*	%	*2020-05-13*	
Surrogate: 4-Bromofluorobenzene	*92*		*70-130*	%	*2020-05-13*	
280 Southridge Drive (0050686-02) | Matrix: Water | Sampled: 2020-05-06 07:20						
Calculated Parameters						
Total Trihalomethanes	**0.0308**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Dichloroacetic Acid	**0.0124**	N/A	0.0020	mg/L	2020-05-19	
Trichloroacetic Acid	**0.0159**	N/A	0.0020	mg/L	2020-05-19	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19	
Total Haloacetic Acids (HAA5)	**0.0283**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*100*		*70-130*	%	*2020-05-19*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0024**	N/A	0.0010	mg/L	2020-05-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-05-13	
Chloroform	**0.0283**	N/A	0.0010	mg/L	2020-05-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-05-13	
Surrogate: Toluene-d8	*104*		*70-130*	%	*2020-05-13*	
Surrogate: 4-Bromofluorobenzene	*92*		*70-130*	%	*2020-05-13*	

40 Crystal Shores Heights (0050686-03) | Matrix: Water | Sampled: 2020-05-06 06:50, Continued

Calculated Parameters					
Total Trihalomethanes	**0.0293**	MAC = 0.1	0.00400	mg/L	N/A
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Dichloroacetic Acid	**0.0122**	N/A	0.0020	mg/L	2020-05-19
Trichloroacetic Acid	**0.0155**	N/A	0.0020	mg/L	2020-05-19
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Total Haloacetic Acids (HAA5)	**0.0277**	MAC = 0.08	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*98*		*70-130*	%	*2020-05-19*
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0024**	N/A	0.0010	mg/L	2020-05-13
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-05-13
Chloroform	**0.0268**	N/A	0.0010	mg/L	2020-05-13
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-05-13
Surrogate: Toluene-d8	*105*		*70-130*	%	*2020-05-13*
Surrogate: 4-Bromofluorobenzene	*92*		*70-130*	%	*2020-05-13*

18 Sheep River Cove (0050686-04) | Matrix: Water | Sampled: 2020-05-06 08:00

Calculated Parameters					
Total Trihalomethanes	**0.0281**	MAC = 0.1	0.00400	mg/L	N/A
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Dichloroacetic Acid	**0.0116**	N/A	0.0020	mg/L	2020-05-19
Trichloroacetic Acid	**0.0141**	N/A	0.0020	mg/L	2020-05-19
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-05-19
Total Haloacetic Acids (HAA5)	**0.0256**	MAC = 0.08	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*102*		*70-130*	%	*2020-05-19*
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0022**	N/A	0.0010	mg/L	2020-05-13
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-05-13
Chloroform	**0.0259**	N/A	0.0010	mg/L	2020-05-13
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-05-13
Surrogate: Toluene-d8	*107*		*70-130*	%	*2020-05-13*
Surrogate: 4-Bromofluorobenzene	*94*		*70-130*	%	*2020-05-13*

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0050686
PROJECT	THM/HAA	**REPORTED**	2020-05-20 09:53

Analysis Description	Method Ref.	Technique	Location
Haloacetic Acids In Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	Richmond
Trihalomethanes In Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
EPA	United States Environmental Protection Agency Test Methods

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, Feb 2017)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

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REPORTED TO	Okotoks, Town of	**WORK ORDER**	0070449
PROJECT	THM/HAA	**REPORTED**	2020-07-14 13:25

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
101 Woodhaven Drive - Enter DS (0070449-01) | Matrix: Water | Sampled: 2020-07-06 08:00						
Calculated Parameters						
Total Trihalomethanes	**0.0228**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Dichloroacetic Acid	**0.0087**	N/A	0.0020	mg/L	2020-07-11	
Trichloroacetic Acid	**0.0123**	N/A	0.0020	mg/L	2020-07-11	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Total Haloacetic Acids (HAA5)	**0.0210**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*110*		*70-130*	%	*2020-07-11*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0016**	N/A	0.0010	mg/L	2020-07-10	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-07-10	
Chloroform	**0.0212**	N/A	0.0010	mg/L	2020-07-10	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-07-10	
Surrogate: Toluene-d8	*89*		*70-130*	%	*2020-07-10*	
Surrogate: 4-Bromofluorobenzene	*101*		*70-130*	%	*2020-07-10*	
Extreme End - 100 Southbank Road (0070449-02) | Matrix: Water | Sampled: 2020-07-06 08:50						
Calculated Parameters						
Total Trihalomethanes	**0.0275**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Dichloroacetic Acid	**0.0105**	N/A	0.0020	mg/L	2020-07-11	
Trichloroacetic Acid	**0.0158**	N/A	0.0020	mg/L	2020-07-11	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11	
Total Haloacetic Acids (HAA5)	**0.0263**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*107*		*70-130*	%	*2020-07-11*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0021**	N/A	0.0010	mg/L	2020-07-10	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-07-10	
Chloroform	**0.0254**	N/A	0.0010	mg/L	2020-07-10	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-07-10	
Surrogate: Toluene-d8	*92*		*70-130*	%	*2020-07-10*	
Surrogate: 4-Bromofluorobenzene	*103*		*70-130*	%	*2020-07-10*	

Random North - 111 Waldren Ave (0070449-03) | Matrix: Water | Sampled: 2020-07-06 07:30, Continued

Calculated Parameters, Continued					
Total Trihalomethanes	**0.0304**	MAC = 0.1	0.00400	mg/L	N/A
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Dichloroacetic Acid	**0.0115**	N/A	0.0020	mg/L	2020-07-11
Trichloroacetic Acid	**0.0166**	N/A	0.0020	mg/L	2020-07-11
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Total Haloacetic Acids (HAA5)	**0.0281**	MAC = 0.08	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*105*		*70-130*	%	*2020-07-11*
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0021**	N/A	0.0010	mg/L	2020-07-10
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-07-10
Chloroform	**0.0284**	N/A	0.0010	mg/L	2020-07-10
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-07-10
Surrogate: Toluene-d8	*92*		*70-130*	%	*2020-07-10*
Surrogate: 4-Bromofluorobenzene	*104*		*70-130*	%	*2020-07-10*

Random South - 22 Southridge Drive (0070449-04) | Matrix: Water | Sampled: 2020-07-06 08:30

Calculated Parameters					
Total Trihalomethanes	**0.0257**	MAC = 0.1	0.00400	mg/L	N/A
Haloacetic Acids					
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Dichloroacetic Acid	**0.0105**	N/A	0.0020	mg/L	2020-07-11
Trichloroacetic Acid	**0.0154**	N/A	0.0020	mg/L	2020-07-11
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-07-11
Total Haloacetic Acids (HAA5)	**0.0259**	MAC = 0.08	0.00200	mg/L	N/A
Surrogate: 2-Bromopropionic Acid	*109*		*70-130*	%	*2020-07-11*
Volatile Organic Compounds (VOC)					
Bromodichloromethane	**0.0018**	N/A	0.0010	mg/L	2020-07-10
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-07-10
Chloroform	**0.0239**	N/A	0.0010	mg/L	2020-07-10
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-07-10
Surrogate: Toluene-d8	*90*		*70-130*	%	*2020-07-10*
Surrogate: 4-Bromofluorobenzene	*101*		*70-130*	%	*2020-07-10*

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0070449
PROJECT	THM/HAA	**REPORTED**	2020-07-14 13:25

Analysis Description	Method Ref.	Technique	Accredited	Location
Haloacetic Acids in Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	✓	Richmond
Trihalomethanes in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
EPA	United States Environmental Protection Agency Test Methods

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, June 2019)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: sgulenchyn@caro.ca

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

REPORTED TO	Okotoks, Town of	**WORK ORDER**	20J0342
PROJECT	THM/HAA	**REPORTED**	2020-10-19 17:23

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
101 Woodhaven Drive (20J0342-01) | Matrix: Water | Sampled: 2020-10-05 07:30						
Calculated Parameters						
Total Trihalomethanes	**0.00986**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Dichloroacetic Acid	**0.0042**	N/A	0.0020	mg/L	2020-10-18	
Trichloroacetic Acid	**0.0038**	N/A	0.0020	mg/L	2020-10-18	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Total Haloacetic Acids (HAA5)	**0.00799**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*93*		*70-130*	%	*2020-10-18*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0011**	N/A	0.0010	mg/L	2020-10-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Chloroform	**0.0087**	N/A	0.0010	mg/L	2020-10-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Surrogate: Toluene-d8	*101*		*70-130*	%	*2020-10-13*	
Surrogate: 4-Bromofluorobenzene	*68*		*70-130*	%	*2020-10-13*	S02
280 Southridge Drive (20J0342-02) | Matrix: Water | Sampled: 2020-10-05 07:45						
Calculated Parameters						
Total Trihalomethanes	**0.0189**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Dichloroacetic Acid	**0.0072**	N/A	0.0020	mg/L	2020-10-18	
Trichloroacetic Acid	**0.0072**	N/A	0.0020	mg/L	2020-10-18	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Total Haloacetic Acids (HAA5)	**0.0144**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*97*		*70-130*	%	*2020-10-18*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0018**	N/A	0.0010	mg/L	2020-10-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Chloroform	**0.0171**	N/A	0.0010	mg/L	2020-10-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Surrogate: Toluene-d8	*103*		*70-130*	%	*2020-10-13*	
Surrogate: 4-Bromofluorobenzene	*69*		*70-130*	%	*2020-10-13*	S02

18 Sheep River Cove (20J0342-03) | Matrix: Water | Sampled: 2020-10-05 06:30, Continued

Calculated Parameters, Continued						
Total Trihalomethanes	**0.0115**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Dichloroacetic Acid	**0.0044**	N/A	0.0020	mg/L	2020-10-18	
Trichloroacetic Acid	**0.0047**	N/A	0.0020	mg/L	2020-10-18	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Total Haloacetic Acids (HAA5)	**0.00912**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*97*		*70-130*	%	*2020-10-18*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0013**	N/A	0.0010	mg/L	2020-10-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Chloroform	**0.0102**	N/A	0.0010	mg/L	2020-10-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Surrogate: Toluene-d8	*105*		*70-130*	%	*2020-10-13*	
Surrogate: 4-Bromofluorobenzene	*70*		*70-130*	%	*2020-10-13*	

51 Drake Landing Loop (20J0342-04) | Matrix: Water | Sampled: 2020-10-05 08:00

Calculated Parameters						
Total Trihalomethanes	**0.0101**	MAC = 0.1	0.00400	mg/L	N/A	
Haloacetic Acids						
Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Dichloroacetic Acid	**0.0041**	N/A	0.0020	mg/L	2020-10-18	
Trichloroacetic Acid	**0.0041**	N/A	0.0020	mg/L	2020-10-18	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2020-10-18	
Total Haloacetic Acids (HAA5)	**0.00823**	MAC = 0.08	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	*98*		*70-130*	%	*2020-10-18*	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0011**	N/A	0.0010	mg/L	2020-10-13	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Chloroform	**0.0089**	N/A	0.0010	mg/L	2020-10-13	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2020-10-13	
Surrogate: Toluene-d8	*102*		*70-130*	%	*2020-10-13*	
Surrogate: 4-Bromofluorobenzene	*69*		*70-130*	%	*2020-10-13*	S02

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Okotoks, Town of	**WORK ORDER**	20J0342
PROJECT	THM/HAA	**REPORTED**	2020-10-19 17:23

Analysis Description	Method Ref.	Technique	Accredited	Location
Haloacetic Acids in Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	✓	Richmond
Trihalomethanes in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
EPA	United States Environmental Protection Agency Test Methods

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, June 2019)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

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11. Annual Summary – Chemicals – Sodium Hypochlorite

Approval # 1029-03-00; Annual Summary of Chemicals Used - Town of Okotoks Waterworks System
Chemical Name - Sodium Hypochlorite (16%)

Parameter		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Sodium Hypochlorite Used Liters	MIN	84	77	78	82	93	90	91	93	92	32	59	34	**32**
	MAX	117	110	102	125	218	124	160	161	128	108	78	91	**218**
	AVG	97	91	88	96	125	103	116	123	105	79	70	74	**97**
	TOTAL	3008	2536	2721	2894	3866	3093	3590	3822	3149	2448	2102	2292	**35521**
Sodium Hypochlorite Used Kilograms	MIN	16.13	14.78	14.98	15.74	17.86	17.28	17.47	17.86	17.66	6.14	11.33	6.53	**6.14**
	MAX	22.46	21.12	19.58	24.00	41.86	23.81	30.72	30.91	24.58	20.74	14.98	17.47	**41.86**
	AVG	18.63	17.39	16.85	18.52	23.94	19.80	22.23	23.67	20.15	15.16	13.45	14.20	**18.67**
	TOTAL	577.54	503.04	522.43	555.65	742.27	593.86	689.28	733.82	604.61	470.02	403.58	440.06	**6836.16**
Chlorine Dosage mg/L	MIN	2.38	2.16	2.17	2.30	2.32	2.13	2.27	1.87	2.03	1.53	1.79	1.41	**1.41**
	MAX	3.16	3.07	2.90	3.27	4.13	3.07	3.16	3.03	3.02	2.74	2.24	2.83	**4.13**
	AVG	2.75	2.58	2.48	2.64	3.04	2.56	2.64	2.27	2.38	2.16	1.96	2.09	**2.46**

12. Annual Summary – Chemicals – Coagulant

Approval # 1029-03-00; Annual Summary of Chemicals Used - Coagulant - Town of Okotoks Waterworks System
Chemical Name - ClearPAC 180 (Poly Aluminum Chloride)

Chemical		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
ClearPAC 180 Used **Litres**	MIN	80.96	66.30	76.29	80.75	37.19	65.45	44.63	38.46	9.35	32.30	26.14	0.00	**0.00**
	MAX	114.54	116.66	124.74	118.58	154.91	164.05	112.51	114.33	80.54	62.90	46.96	41.86	**164.05**
	AVG	101.26	93.23	92.84	98.19	94.91	83.00	73.91	76.11	53.43	49.01	35.37	23.77	**72.92**
	TOTAL	3139.05	2693.01	2877.89	2945.68	2942.28	2490.08	2291.27	2359.39	1602.89	1519.16	1061.01	736.95	**26658.64**
ClearPAC 180 Used **Kilograms**	MIN	110.92	90.83	104.51	110.63	50.95	89.67	61.14	52.69	12.81	44.25	35.81	0.00	**0.00**
	MAX	156.92	159.83	170.89	162.45	212.23	224.75	154.13	156.63	110.34	86.17	64.34	57.35	**224.75**
	AVG	138.73	127.73	127.18	134.52	130.03	113.71	101.26	104.27	73.20	67.14	48.45	32.57	**99.90**
	TOTAL	4300.50	3689.43	3942.71	4035.57	4030.92	3411.40	3139.04	3232.36	2195.96	2081.25	1453.59	1009.62	**36522.34**
ClearPAC 180 Dosage **mg/L**	MIN	16.82	13.68	15.34	15.50	7.12	10.16	7.00	4.79	1.50	5.70	5.38	0.00	**0.00**
	MAX	22.81	23.05	24.95	22.88	26.04	31.86	17.02	15.30	11.70	16.91	9.44	9.57	**31.86**
	AVG	20.47	18.97	18.76	19.25	16.43	14.79	11.98	10.01	8.59	9.79	7.08	4.83	**13.41**
Aluminum (Al^{3+}) Dosage **mg/L**	MIN	1.51	1.23	1.38	1.40	0.64	0.91	0.63	0.43	0.13	0.51	0.48	0.00	**0.00**
	MAX	2.05	2.07	2.25	2.06	2.34	2.87	1.53	1.38	1.05	1.52	0.85	0.86	**2.87**
	AVG	1.84	1.71	1.69	1.73	1.48	1.33	1.08	0.90	0.77	0.88	0.64	0.43	**1.21**

NOTE: Dec 18-21, 2020, coagulant injectors were plugged off and not injecting coagulant. Repairs on injectors performed, lines flushed and injectors back in service.

13. Annual Summary – Chemicals – Polymer

Approval # 1029-03-00; Annual Summary of Chemicals Used - Polymer - Town of Okotoks Waterworks System
Chemical Name - Hydrex 3613 (Dry Polymer)

Parameter		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Polymer Used **Litres**	MIN	3.79	2.91	2.86	3.49	3.67	3.99	3.79	5.22	4.28	2.42	3.59	2.77	**2.42**
	MAX	4.73	4.27	4.18	4.43	7.75	7.79	7.01	7.10	5.92	5.12	4.42	4.81	**7.79**
	AVG	4.14	3.80	3.63	3.85	4.80	5.70	5.09	6.29	5.09	4.19	4.11	4.07	**4.56**
	TOTAL	128.22	110.28	112.43	115.62	148.80	171.13	157.73	195.08	168.08	129.76	123.33	126.04	**1686.49**
Polymer Used **Kilograms**	MIN	0.76	0.58	0.57	0.70	0.73	0.80	0.76	1.04	0.86	0.48	0.72	0.55	**0.48**
	MAX	0.95	0.85	0.84	0.89	1.55	1.56	1.40	1.42	1.18	1.02	0.88	0.96	**1.56**
	AVG	0.83	0.76	0.73	0.77	0.96	1.14	1.02	1.26	1.02	0.84	0.82	0.81	**0.91**
	TOTAL	25.64	24.25	22.49	23.12	29.76	34.23	31.55	39.02	33.62	25.95	24.67	25.21	**339.49**
Polymer Dosage **mg/L**	MIN	0.12	0.09	0.09	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	**0.09**
	MAX	0.13	0.12	0.11	0.11	0.16	0.16	0.12	0.12	0.12	0.12	0.12	0.12	**0.16**
	AVG	0.12	0.11	0.11	0.11	0.12	0.15	0.12	0.12	0.12	0.12	0.12	0.12	**0.12**

14. Treated Water - Physical, Inorganic and Organic Chemical & Pesticide Parameters

SEMI-ANNUAL SAMPLE # 1 – January 8, 2020

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0010434
PROJECT	Schedule 4	**REPORTED**	2020-01-29 09:09

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
3 Elma Street East (0010434-01) | Matrix: Water | Sampled: 2020-01-08 09:00						
Acid Herbicides						
2,4,5-T	< 0.10	N/A	0.10	µg/L	2020-01-23	
2,4-D	< 0.10	MAC = 100	0.10	µg/L	2020-01-23	
Dicamba	< 0.10	MAC = 120	0.10	µg/L	2020-01-23	
Dinoseb	< 0.10	N/A	0.10	µg/L	2020-01-23	
MCPA	< 0.20	MAC = 100	0.20	µg/L	2020-01-23	
Picloram	< 0.10	MAC = 190	0.10	µg/L	2020-01-23	
Surrogate: 2,4-DCAA	*104*		*60-126*	%	*2020-01-23*	
Anions						
Bromate	< 0.010	MAC = 0.01	0.010	mg/L	2020-01-10	
Chloride	**16.0**	AO ≤ 250	0.10	mg/L	2020-01-11	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2020-01-11	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2020-01-11	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2020-01-11	
Sulfate	**59.2**	AO ≤ 500	1.0	mg/L	2020-01-11	
Calculated Parameters						
Chloramines	**0.140**	MAC = 3	0.0400	mg/L	N/A	
Total Trihalomethanes	**0.0223**	MAC = 0.1	0.00400	mg/L	N/A	
Hardness, Total (as CaCO3)	**247**	None Required	0.500	mg/L	N/A	
Solids, Total Dissolved	**314**	AO ≤ 500	1.00	mg/L	N/A	
Chlorinated Phenols						
2-Chlorophenol	< 0.10	N/A	0.10	µg/L	2020-01-13	
3 & 4-Chlorophenol	< 0.10	N/A	0.10	µg/L	2020-01-13	
4-Chloro-3-Methylphenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,3-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-01-13	
2,4 & 2,5-Dichlorophenol	< 0.20	AO ≤ 0.3	0.20	µg/L	2020-01-13	
2,6-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-01-13	
3,4-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-01-13	
3,5-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-01-13	
2,3,4-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,3,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,3,6-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,4,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,4,6-Trichlorophenol	< 0.50	AO ≤ 2	0.50	µg/L	2020-01-13	
3,4,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	< 0.50	N/A	0.50	µg/L	2020-01-13	
2,3,4,6-Tetrachlorophenol	< 0.50	AO ≤ 1	0.50	µg/L	2020-01-13	
Pentachlorophenol	< 0.50	AO ≤ 30	0.50	µg/L	2020-01-13	
Surrogate: 2,4-Dibromophenol	*93*		*60-130*	%	*2020-01-13*	
Surrogate: 2,4,6-Tribromophenol	*93*		*60-130*	%	*2020-01-13*	
General Parameters						

General Parameters, Continued						
Alkalinity, Total (as CaCO3)	**226**	N/A	1.0	mg/L	2020-01-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-01-13	
Alkalinity, Bicarbonate (as CaCO3)	**226**	N/A	1.0	mg/L	2020-01-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-01-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-01-13	
Ammonia, Total (as N)	**0.084**	None Required	0.050	mg/L	2020-01-13	
Carbon, Total Organic	**1.08**	N/A	0.50	mg/L	2020-01-13	
Chlorine, Total	**1.16**	None Required	0.02	mg/L	2020-01-09	HT2
Chlorine, Free	**1.02**	N/A	0.02	mg/L	2020-01-09	HT2
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2020-01-10	
Conductivity (EC)	**492**	N/A	2.0	µS/cm	2020-01-13	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2020-01-13	
Nitrilotriacetic Acid	< 0.20	MAC = 0.4	0.20	mg/L	2020-01-14	
pH	**7.82**	7.0-10.5	0.10	pH units	2020-01-13	HT2
Sulfide, Total	< 0.020	AO ≤ 0.05	0.020	mg/L	2020-01-10	
Turbidity	**0.20**	OG < 1	0.10	NTU	2020-01-14	HT1
Microbiological Parameters						
Microcystin, total	< 0.14	MAC = 1.5	0.14	µg/L	2020-01-21	
Miscellaneous Herbicides						
Glyphosate	< 0.050	MAC = 0.28	0.050	mg/L	2020-01-20	
Pesticides, Herbicides, and Fungicides						
Alachlor	< 0.100	N/A	0.100	µg/L	2020-01-15	
Aldrin	< 0.006	N/A	0.006	µg/L	2020-01-15	
Atrazine and metabolites	< 0.100	MAC = 5	0.100	µg/L	2020-01-15	
Azinphos-methyl	< 0.200	MAC = 20	0.200	µg/L	2020-01-15	
alpha-BHC	< 0.010	N/A	0.010	µg/L	2020-01-15	
beta-BHC	< 0.050	N/A	0.050	µg/L	2020-01-15	
delta-BHC	< 0.050	N/A	0.050	µg/L	2020-01-15	
gamma-BHC (Lindane)	< 0.050	N/A	0.050	µg/L	2020-01-15	
Bromacil	< 0.100	N/A	0.100	µg/L	2020-01-15	
Bromoxynil	< 0.200	MAC = 5	0.200	µg/L	2020-01-15	
Butachlor	< 0.020	N/A	0.020	µg/L	2020-01-15	
Captan	< 0.100	N/A	0.100	µg/L	2020-01-15	
Chlordane (cis + trans)	< 0.050	N/A	0.050	µg/L	2020-01-15	
Chlorothalonil	< 0.050	N/A	0.050	µg/L	2020-01-15	
Chlorpyrifos	< 0.010	MAC = 90	0.010	µg/L	2020-01-15	
Cyanazine	< 0.100	N/A	0.100	µg/L	2020-01-15	
DDT, Total	< 0.010	N/A	0.010	µg/L	2020-01-15	
Deltamethrin	< 0.100	N/A	0.100	µg/L	2020-01-15	
Diazinon	< 0.020	MAC = 20	0.020	µg/L	2020-01-15	

Pesticides, Herbicides, and Fungicides, Continued					
Dichlorvos	< 0.100	N/A	0.100	µg/L	2020-01-15
Diclofop-methyl	< 0.100	MAC = 9	0.100	µg/L	2020-01-15
Dieldrin	< 0.010	N/A	0.010	µg/L	2020-01-15
Dimethoate	< 0.200	MAC = 20	0.200	µg/L	2020-01-15
Disulfoton	< 0.100	N/A	0.100	µg/L	2020-01-15
Diuron	< 0.200	MAC = 150	0.200	µg/L	2020-01-15
Endosulfan I + II	< 0.010	N/A	0.010	µg/L	2020-01-15
Endosulfan sulfate	< 0.050	N/A	0.050	µg/L	2020-01-15
Endrin	< 0.020	N/A	0.020	µg/L	2020-01-15
Endrin aldehyde	< 0.020	N/A	0.020	µg/L	2020-01-15
Endrin ketone	< 0.020	N/A	0.020	µg/L	2020-01-15
Fenchlorphos (Ronnel)	< 0.100	N/A	0.100	µg/L	2020-01-15
Heptachlor	< 0.010	N/A	0.010	µg/L	2020-01-15
Heptachlor epoxide	< 0.010	N/A	0.010	µg/L	2020-01-15
Linuron	< 0.050	N/A	0.050	µg/L	2020-01-15
Malathion	< 0.100	MAC = 190	0.100	µg/L	2020-01-15
Methoxychlor	< 0.050	N/A	0.050	µg/L	2020-01-15
Methyl parathion	< 0.100	N/A	0.100	µg/L	2020-01-15
Metolachlor	< 0.100	MAC = 50	0.100	µg/L	2020-01-15
Metribuzin	< 0.200	MAC = 80	0.200	µg/L	2020-01-15
Parathion	< 0.100	N/A	0.100	µg/L	2020-01-15
Pentachloronitrobenzene	< 0.100	N/A	0.100	µg/L	2020-01-15
Permethrin	< 0.010	N/A	0.010	µg/L	2020-01-15
Phorate	< 0.100	MAC = 2	0.100	µg/L	2020-01-15
Prometon	< 0.300	N/A	0.300	µg/L	2020-01-15
Prometryne	< 0.100	N/A	0.100	µg/L	2020-01-15
Simazine	< 0.200	MAC = 10	0.200	µg/L	2020-01-15
Sulfotep	< 0.100	N/A	0.100	µg/L	2020-01-15
Tebuthiuron	< 0.200	N/A	0.200	µg/L	2020-01-15
Temephos (Abate)	< 0.500	N/A	0.500	µg/L	2020-01-15
Terbufos	< 0.100	MAC = 1	0.100	µg/L	2020-01-15
Triallate	< 0.100	N/A	0.100	µg/L	2020-01-15
Trifluralin	< 0.200	MAC = 45	0.200	µg/L	2020-01-15
Surrogate: Tributyl Phosphate	*114*		*50-140*	%	*2020-01-15*
Surrogate: 4-chloro-3-nitrobenzotrifluoride	*101*		*50-140*	%	*2020-01-15*
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	N/A	0.050	µg/L	2020-01-11
Acenaphthylene	< 0.200	N/A	0.200	µg/L	2020-01-11
Acridine	< 0.050	N/A	0.050	µg/L	2020-01-11
Anthracene	< 0.010	N/A	0.010	µg/L	2020-01-11
Benz(a)anthracene	< 0.010	N/A	0.010	µg/L	2020-01-11
Benzo(a)pyrene	< 0.010	MAC = 0.04	0.010	µg/L	2020-01-11

Volatile Organic Compounds (VOC), Continued					S03
Bromodichloromethane	**3.2**	N/A	1.0	µg/L	2020-01-12
Bromoform	**8.9**	N/A	1.0	µg/L	2020-01-12
Carbon tetrachloride	< 0.5	MAC = 2	0.5	µg/L	2020-01-12
Chlorobenzene	< 1.0	AO ≤ 30	1.0	µg/L	2020-01-12
Chloroethane	< 2.0	N/A	2.0	µg/L	2020-01-12
Chloroform	**7.6**	N/A	1.0	µg/L	2020-01-12
Dibromochloromethane	**2.6**	N/A	1.0	µg/L	2020-01-12
1,2-Dibromoethane	< 0.3	N/A	0.3	µg/L	2020-01-12
Dibromomethane	< 1.0	N/A	1.0	µg/L	2020-01-12
1,2-Dichlorobenzene	< 0.5	AO ≤ 3	0.5	µg/L	2020-01-12
1,3-Dichlorobenzene	< 1.0	N/A	1.0	µg/L	2020-01-12
1,4-Dichlorobenzene	< 1.0	AO ≤ 1	1.0	µg/L	2020-01-12
1,1-Dichloroethane	< 1.0	N/A	1.0	µg/L	2020-01-12
1,2-Dichloroethane	< 1.0	MAC = 5	1.0	µg/L	2020-01-12
1,1-Dichloroethylene	< 1.0	MAC = 14	1.0	µg/L	2020-01-12
cis-1,2-Dichloroethylene	< 1.0	N/A	1.0	µg/L	2020-01-12
trans-1,2-Dichloroethylene	< 1.0	N/A	1.0	µg/L	2020-01-12
Dichloromethane	< 3.0	MAC = 50	3.0	µg/L	2020-01-12
1,2-Dichloropropane	< 1.0	N/A	1.0	µg/L	2020-01-12
1,3-Dichloropropene (cis + trans)	< 1.0	N/A	1.0	µg/L	2020-01-12
Ethylbenzene	< 1.0	AO ≤ 1.6	1.0	µg/L	2020-01-12
Methyl tert-butyl ether	< 1.0	AO ≤ 15	1.0	µg/L	2020-01-12
Styrene	< 1.0	N/A	1.0	µg/L	2020-01-12
1,1,2,2-Tetrachloroethane	< 0.5	N/A	0.5	µg/L	2020-01-12
Tetrachloroethylene	< 1.0	MAC = 10	1.0	µg/L	2020-01-12
Toluene	< 1.0	AO ≤ 24	1.0	µg/L	2020-01-12
1,1,1-Trichloroethane	< 1.0	N/A	1.0	µg/L	2020-01-12
1,1,2-Trichloroethane	< 1.0	N/A	1.0	µg/L	2020-01-12
Trichloroethylene	< 1.0	MAC = 5	1.0	µg/L	2020-01-12
Trichlorofluoromethane	< 1.0	N/A	1.0	µg/L	2020-01-12
Vinyl chloride	< 1.0	MAC = 2	1.0	µg/L	2020-01-12
Xylenes (total)	< 2.0	AO ≤ 20	2.0	µg/L	2020-01-12
Surrogate: Toluene-d8	*5*		*70-130*	%	*2020-01-12*
Surrogate: 4-Bromofluorobenzene	*120*		*70-130*	%	*2020-01-12*
Surrogate: 1,4-Dichlorobenzene-d4	*111*		*70-130*	%	*2020-01-12*

Sample Qualifiers:

HT1	The sample was prepared and/or analyzed past the recommended holding time.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
S03	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0010434
PROJECT	Schedule 4	**REPORTED**	2020-01-29 09:09

Analysis Description	Method Ref.	Technique	Location
Acid Herbicides in Water	EPA 8151A*	DCM Extraction with Diazomethane Derivatization, GC-MS	Richmond
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	Kelowna
Ammonia, Total in Water	SM 4500-NH3 D* (2017)	Ion Selective Electrode	Edmonton
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Bromate in Water	SM 4110 B (2017)	Ion Chromatography	Sublet
Carbon, Total Organic in Water	SM 5310 B (2017)	Combustion, Infrared CO2 Detection	Kelowna
Chlorine, Free in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)	Edmonton
Chlorine, Total in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)	Edmonton
Colour, True in Water	SM 2120 C (2017)	Spectrophotometry (456 nm)	Edmonton
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	Kelowna
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)	Sublet
Glyphosate in Water	EPA 547*	Direct Aqueous Injection HPLC with Post-Column Derivatization and Fluorescence Detection	Richmond
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Nitrilotriacetic Acid in Water	EPA 430.1	Manual Colorimetry (Zinc-Zincon)	Kelowna
Pesticides in Water	EPA 3510C* / EPA 8270D*	Liquid-Liquid DCM Extraction (B/N) / GC-MSD (SIM)	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	Kelowna
Phenols, Chlorinated in Water	EPA 3510C* / EPA 8270D	Liquid-Liquid DCM Extraction (Acidic) / GC-MSD (SIM)	Richmond
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	Richmond
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)	N/A
Sulfide, Total in Water	SM 4500-S2 D* (2017)	Colorimetry (Methylene Blue)	Edmonton
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	Kelowna
Volatile Organic Compounds in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
CU	Colour Units (referenced against a platinum cobalt standard)
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, ph > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre

ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:sgulenchyn@caro.ca

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0010434
PROJECT	Schedule 4	**REPORTED**	2020-01-29 09:09

ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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SEMI-ANNUAL SAMPLE # 2 – July 6, 2020

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0070447
PROJECT	Schedule 4	**REPORTED**	2020-08-05 12:56

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
July 2020 Schedule 4 (100 Southbank Road) (0070447-01) | Matrix: Water | Sampled: 2020-07-06 09:00						
Acid Herbicides						
2,4,5-T	< 0.10	N/A	0.10	µg/L	2020-07-16	
2,4-D	< 0.10	MAC = 100	0.10	µg/L	2020-07-16	
Dicamba	< 0.10	MAC = 120	0.10	µg/L	2020-07-16	
Dinoseb	< 0.10	N/A	0.10	µg/L	2020-07-16	
MCPA	< 0.20	MAC = 100	0.20	µg/L	2020-07-16	
Picloram	< 0.10	MAC = 190	0.10	µg/L	2020-07-16	
Surrogate: 2,4-DCAA	*95*		*60-126*	%	*2020-07-16*	
Anions						
Bromate	< 0.010	MAC = 0.01	0.010	mg/L	2020-07-09	
Chloride	**10.7**	AO ≤ 250	0.50	mg/L	2020-07-09	
Fluoride	**0.17**	MAC = 1.5	0.10	mg/L	2020-07-09	
Nitrate (as N)	**0.075**	MAC = 10	0.050	mg/L	2020-07-09	
Nitrite (as N)	< 0.050	MAC = 1	0.050	mg/L	2020-07-09	
Sulfate	**39.2**	AO ≤ 500	1.0	mg/L	2020-07-09	
Calculated Parameters						
Chloramines	**0.110**	MAC = 3	0.0400	mg/L	N/A	
Total Trihalomethanes	**0.0236**	MAC = 0.1	0.00400	mg/L	N/A	
Hardness, Total (as CaCO3)	**222**	None Required	0.541	mg/L	N/A	
Solids, Total Dissolved	**271**	AO ≤ 500	3.35	mg/L	N/A	
Chlorinated Phenols						
2-Chlorophenol	< 0.10	N/A	0.10	µg/L	2020-07-12	
3 & 4-Chlorophenol	< 0.10	N/A	0.10	µg/L	2020-07-12	
4-Chloro-3-Methylphenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,3-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-07-12	
2,4 & 2,5-Dichlorophenol	< 0.20	AO ≤ 0.3	0.20	µg/L	2020-07-12	
2,6-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-07-12	
3,4-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-07-12	
3,5-Dichlorophenol	< 0.20	N/A	0.20	µg/L	2020-07-12	
2,3,4-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,3,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,3,6-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,4,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,4,6-Trichlorophenol	< 0.50	AO ≤ 2	0.50	µg/L	2020-07-12	
3,4,5-Trichlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,3,4,5 & 2,3,5,6-Tetrachlorophenol	< 0.50	N/A	0.50	µg/L	2020-07-12	
2,3,4,6-Tetrachlorophenol	< 0.50	AO ≤ 1	0.50	µg/L	2020-07-12	
Pentachlorophenol	< 0.50	AO ≤ 30	0.50	µg/L	2020-07-12	
Surrogate: 2,4-Dibromophenol	*62*		*60-130*	%	*2020-07-12*	
Surrogate: 2,4,6-Tribromophenol	*59*		*60-130*	%	*2020-07-12*	S02
General Parameters						

General Parameters, Continued						
Alkalinity, Total (as CaCO3)	**212**	N/A	2.0	mg/L	2020-07-09	
Bicarbonate (HCO3)	**259**	N/A	2.0	mg/L	2020-07-09	
Carbonate (CO3)	< 2.0	N/A	2.0	mg/L	2020-07-09	
Hydroxide (OH)	< 2.0	N/A	2.0	mg/L	2020-07-09	
Ammonia, Total (as N)	**0.055**	None Required	0.050	mg/L	2020-07-08	
Carbon, Total Organic	**1.81**	N/A	0.50	mg/L	2020-07-09	
Chlorine, Total	**0.75**	None Required	0.02	mg/L	2020-07-09	HT2
Chlorine, Free	**0.64**	N/A	0.02	mg/L	2020-07-09	HT2
Colour, True	< 5.0	AO = 15	5.0	CU	2020-07-08	
Conductivity (EC)	**480**	N/A	2.0	µS/cm	2020-07-09	
Nitrilotriacetic Acid	< 0.20	MAC = 0.4	0.20	mg/L	2020-07-11	
pH	**7.08**	7.0-10.5	0.10	pH units	2020-07-09	HT2
Sulfide, Total	< 0.020	AO = 0.05	0.020	mg/L	2020-07-09	
Turbidity	< 0.10	OG < 1	0.10	NTU	2020-07-07	
Miscellaneous Herbicides						
Glyphosate	< 0.050	MAC = 0.28	0.050	mg/L	2020-07-16	
Pesticides, Herbicides, and Fungicides						
Alachlor	< 0.100	N/A	0.100	µg/L	2020-07-16	
Aldrin	< 0.006	N/A	0.006	µg/L	2020-07-16	
Atrazine and metabolites	< 0.100	MAC = 5	0.100	µg/L	2020-07-16	
Azinphos-methyl	< 0.200	MAC = 20	0.200	µg/L	2020-07-16	
alpha-BHC	< 0.010	N/A	0.010	µg/L	2020-07-16	
beta-BHC	< 0.050	N/A	0.050	µg/L	2020-07-16	
delta-BHC	< 0.050	N/A	0.050	µg/L	2020-07-16	
gamma-BHC (Lindane)	< 0.050	N/A	0.050	µg/L	2020-07-16	
Bromacil	< 0.100	N/A	0.100	µg/L	2020-07-16	
Bromoxynil	< 0.200	MAC = 5	0.200	µg/L	2020-07-16	
Butachlor	< 0.020	N/A	0.020	µg/L	2020-07-16	
Captan	< 0.100	N/A	0.100	µg/L	2020-07-16	
Chlordane (cis + trans)	< 0.050	N/A	0.050	µg/L	2020-07-16	
Chlorothalonil	< 0.050	N/A	0.050	µg/L	2020-07-16	
Chlorpyrifos	< 0.010	MAC = 90	0.010	µg/L	2020-07-16	
Cyanazine	< 0.100	N/A	0.100	µg/L	2020-07-16	
DDT, Total	< 0.010	N/A	0.010	µg/L	2020-07-16	
Deltamethrin	< 0.100	N/A	0.100	µg/L	2020-07-16	
Diazinon	< 0.020	MAC = 20	0.020	µg/L	2020-07-16	
Dichlorvos	< 0.100	N/A	0.100	µg/L	2020-07-16	
Diclofop-methyl	< 0.100	MAC = 9	0.100	µg/L	2020-07-16	
Dieldrin	< 0.010	N/A	0.010	µg/L	2020-07-16	
Dimethoate	< 0.200	MAC = 20	0.200	µg/L	2020-07-16	
Disulfoton	< 0.100	N/A	0.100	µg/L	2020-07-16	

Pesticides, Herbicides, and Fungicides, Continued					
Diuron	< 0.200	MAC = 150	0.200	µg/L	2020-07-16
Endosulfan I + II	< 0.010	N/A	0.010	µg/L	2020-07-16
Endosulfan sulfate	< 0.050	N/A	0.050	µg/L	2020-07-16
Endrin	< 0.020	N/A	0.020	µg/L	2020-07-16
Endrin aldehyde	< 0.020	N/A	0.020	µg/L	2020-07-16
Endrin ketone	< 0.020	N/A	0.020	µg/L	2020-07-16
Fenchlorphos (Ronnel)	< 0.100	N/A	0.100	µg/L	2020-07-16
Heptachlor	< 0.010	N/A	0.010	µg/L	2020-07-16
Heptachlor epoxide	< 0.010	N/A	0.010	µg/L	2020-07-16
Linuron	< 0.050	N/A	0.050	µg/L	2020-07-16
Malathion	< 0.100	MAC = 190	0.100	µg/L	2020-07-16
Methoxychlor	< 0.050	N/A	0.050	µg/L	2020-07-16
Methyl parathion	< 0.100	N/A	0.100	µg/L	2020-07-16
Metolachlor	< 0.100	MAC = 50	0.100	µg/L	2020-07-16
Metribuzin	< 0.200	MAC = 80	0.200	µg/L	2020-07-16
Parathion	< 0.100	N/A	0.100	µg/L	2020-07-16
Pentachloronitrobenzene	< 0.100	N/A	0.100	µg/L	2020-07-16
Permethrin	< 0.010	N/A	0.010	µg/L	2020-07-16
Phorate	< 0.100	MAC = 2	0.100	µg/L	2020-07-16
Prometon	< 0.300	N/A	0.300	µg/L	2020-07-16
Prometryne	< 0.100	N/A	0.100	µg/L	2020-07-16
Simazine	< 0.200	MAC = 10	0.200	µg/L	2020-07-16
Sulfotep	< 0.100	N/A	0.100	µg/L	2020-07-16
Tebuthiuron	< 0.200	N/A	0.200	µg/L	2020-07-16
Temephos (Abate)	< 0.500	N/A	0.500	µg/L	2020-07-16
Terbufos	< 0.100	MAC = 1	0.100	µg/L	2020-07-16
Triallate	< 0.100	N/A	0.100	µg/L	2020-07-16
Trifluralin	< 0.200	MAC = 45	0.200	µg/L	2020-07-16
Surrogate: Tributyl Phosphate	*104*		*50-140*	%	*2020-07-16*
Surrogate: 4-chloro-3-nitrobenzotrifluoride	*70*		*50-140*	%	*2020-07-16*
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	N/A	0.050	µg/L	2020-07-09
Acenaphthylene	< 0.200	N/A	0.200	µg/L	2020-07-09
Acridine	< 0.050	N/A	0.050	µg/L	2020-07-09
Anthracene	< 0.010	N/A	0.010	µg/L	2020-07-09
Benz(a)anthracene	< 0.010	N/A	0.010	µg/L	2020-07-09
Benzo(a)pyrene	< 0.010	MAC = 0.04	0.010	µg/L	2020-07-09
Benzo(b+j)fluoranthene	< 0.050	N/A	0.050	µg/L	2020-07-09
Benzo(g,h,i)perylene	< 0.050	N/A	0.050	µg/L	2020-07-09
Benzo(k)fluoranthene	< 0.050	N/A	0.050	µg/L	2020-07-09
2-Chloronaphthalene	< 0.100	N/A	0.100	µg/L	2020-07-09
Chrysene	< 0.050	N/A	0.050	µg/L	2020-07-09

Polycyclic Aromatic Hydrocarbons (PAH), Continued						
Dibenz(a,h)anthracene	< 0.010	N/A	0.010	µg/L	2020-07-09	
Fluoranthene	< 0.030	N/A	0.030	µg/L	2020-07-09	
Fluorene	< 0.050	N/A	0.050	µg/L	2020-07-09	
Indeno(1,2,3-cd)pyrene	< 0.050	N/A	0.050	µg/L	2020-07-09	
1-Methylnaphthalene	< 0.100	N/A	0.100	µg/L	2020-07-09	
2-Methylnaphthalene	< 0.100	N/A	0.100	µg/L	2020-07-09	
Naphthalene	< 0.200	N/A	0.200	µg/L	2020-07-09	
Phenanthrene	< 0.100	N/A	0.100	µg/L	2020-07-09	
Pyrene	< 0.020	N/A	0.020	µg/L	2020-07-09	
Quinoline	< 0.050	N/A	0.050	µg/L	2020-07-09	
Surrogate: Acridine-d9	*146*		*50-140*	%	*2020-07-09*	S02
Surrogate: Naphthalene-d8	*94*		*50-140*	%	*2020-07-09*	
Surrogate: Perylene-d12	*71*		*50-140*	%	*2020-07-09*	
Total Metals						
Aluminum, total	**0.0410**	OG < 0.1	0.0050	mg/L	2020-07-10	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2020-07-10	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2020-07-10	
Barium, total	**0.0894**	MAC = 2	0.0050	mg/L	2020-07-10	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2020-07-10	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2020-07-10	
Calcium, total	**62.0**	None Required	0.20	mg/L	2020-07-10	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2020-07-10	
Copper, total	**0.00823**	MAC = 2	0.00040	mg/L	2020-07-10	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2020-07-10	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2020-07-10	
Magnesium, total	**16.1**	None Required	0.010	mg/L	2020-07-10	
Manganese, total	**0.00034**	MAC = 0.12	0.00020	mg/L	2020-07-10	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2020-07-12	
Potassium, total	**1.60**	N/A	0.10	mg/L	2020-07-10	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2020-07-10	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2020-07-10	
Sodium, total	**11.4**	AO ≤ 200	0.10	mg/L	2020-07-10	
Strontium, total	**0.301**	7	0.0010	mg/L	2020-07-10	
Uranium, total	**0.000658**	MAC = 0.02	0.000020	mg/L	2020-07-10	
Zinc, total	**0.0053**	AO ≤ 5	0.0040	mg/L	2020-07-10	
Volatile Organic Compounds (VOC)						CT8
Benzene	< 0.5	MAC = 5	0.5	µg/L	2020-07-12	
Bromodichloromethane	**1.9**	N/A	1.0	µg/L	2020-07-12	
Bromoform	< 1.0	N/A	1.0	µg/L	2020-07-12	
Carbon tetrachloride	< 0.5	MAC = 2	0.5	µg/L	2020-07-12	
Chlorobenzene	< 1.0	AO ≤ 30	1.0	µg/L	2020-07-12	

Volatile Organic Compounds (VOC), Continued					CT8
Chloroethane	< 2.0	N/A	2.0 µg/L	2020-07-12	
Chloroform	21.8	N/A	1.0 µg/L	2020-07-12	
Dibromochloromethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,2-Dibromoethane	< 0.3	N/A	0.3 µg/L	2020-07-12	
Dibromomethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,2-Dichlorobenzene	< 0.5	AO ≤ 3	0.5 µg/L	2020-07-12	
1,3-Dichlorobenzene	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,4-Dichlorobenzene	< 1.0	AO ≤ 1	1.0 µg/L	2020-07-12	
1,1-Dichloroethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,2-Dichloroethane	< 1.0	MAC = 5	1.0 µg/L	2020-07-12	
1,1-Dichloroethylene	< 1.0	MAC = 14	1.0 µg/L	2020-07-12	
cis-1,2-Dichloroethylene	< 1.0	N/A	1.0 µg/L	2020-07-12	
trans-1,2-Dichloroethylene	< 1.0	N/A	1.0 µg/L	2020-07-12	
Dichloromethane	< 3.0	MAC = 50	3.0 µg/L	2020-07-12	
1,2-Dichloropropane	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,3-Dichloropropene (cis + trans)	< 1.0	N/A	1.0 µg/L	2020-07-12	
Ethylbenzene	< 1.0	AO ≤ 1.6	1.0 µg/L	2020-07-12	
Methyl tert-butyl ether	< 1.0	AO ≤ 15	1.0 µg/L	2020-07-12	
Styrene	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,1,2,2-Tetrachloroethane	< 0.5	N/A	0.5 µg/L	2020-07-12	
Tetrachloroethylene	< 1.0	MAC = 10	1.0 µg/L	2020-07-12	
Toluene	< 1.0	AO ≤ 24	1.0 µg/L	2020-07-12	
1,1,1-Trichloroethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
1,1,2-Trichloroethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
Trichloroethylene	< 1.0	MAC = 5	1.0 µg/L	2020-07-12	
Trichlorofluoromethane	< 1.0	N/A	1.0 µg/L	2020-07-12	
Vinyl chloride	< 1.0	MAC = 2	1.0 µg/L	2020-07-12	
Xylenes (total)	< 2.0	AO ≤ 20	2.0 µg/L	2020-07-12	
Surrogate: Toluene-d8	*82*		*70-130 %*	*2020-07-12*	
Surrogate: 4-Bromofluorobenzene	*102*		*70-130 %*	*2020-07-12*	
Surrogate: 1,4-Dichlorobenzene-d4	*102*		*70-130 %*	*2020-07-12*	

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0070447
PROJECT	Schedule 4	**REPORTED**	2020-08-05 12:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Acid Herbicides in Water	EPA 8151A*	DCM Extraction with Diazomethane Derivatization, GC-MS	✓	Richmond
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Edmonton
Ammonia, Total in Water	SM 4500-NH3 D* (2017)	Ion Selective Electrode	✓	Edmonton
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Edmonton
Bromate in Water	SM 4110 B (2017)	Ion Chromatography		Sublet
Carbon, Total Organic in Water	SM 5310 B (2017)	Combustion, Infrared CO2 Detection	✓	Kelowna
Chlorine, Free in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)		Edmonton
Chlorine, Total in Water	SM 4500-Cl G (2017)	Colorimetry (DPD)		Edmonton
Colour, True in Water	SM 2120 C (2017)	Spectrophotometry (456 nm)		Edmonton
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Edmonton
Glyphosate in Water	EPA 547*	Direct Aqueous Injection HPLC with Post-Column Derivatization and Fluorescence Detection	✓	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrilotriacetic Acid in Water	EPA 430.1	Manual Colorimetry (Zinc-Zincon)		Kelowna
Pesticides in Water	EPA 3510C* / EPA 8270D*	Liquid-Liquid DCM Extraction (B/N) / GC-MSD (SIM)	✓	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Edmonton
Phenols, Chlorinated in Water	EPA 3510C* / EPA 8270D	Liquid-Liquid DCM Extraction (Acidic) / GC-MSD (SIM)	✓	Richmond
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	✓	Richmond
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)		N/A
Sulfide, Total in Water	SM 4500-S2 D* (2017)	Colorimetry (Methylene Blue)	✓	Edmonton
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	✓	Edmonton
Volatile Organic Compounds in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
CU	Colour Units (referenced against a platinum cobalt standard)
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, ph > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:sgulenchyn@caro.ca

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

15. Treated Water – Cyanobacterial Toxins (as Microcystin-LR)

Distribution Grab Sample # 1 – Sampling Period: August 1st – 16th

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0081187
PROJECT	Schedule 4	**REPORTED**	2020-09-11 16:48

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
01-August 2020 Microcystin (0081187-01) | Matrix: Water | Sampled: 2020-08-10 07:30						
Microbiological Parameters						
Microcystin, total	< 0.14	MAC = 1.5	0.14	µg/L	2020-08-14	

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0081187
PROJECT	Schedule 4	**REPORTED**	2020-09-11 16:48

Analysis Description	Method Ref.	Technique	Accredited	Location
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)		Sublet

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MAC	Maximum Acceptable Concentration (health based)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, June 2019)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

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Distribution Grab Sample # 2 – Sampling Period: September 1st – 16th

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0090393
PROJECT	Schedule 4	**REPORTED**	2020-10-08 13:44

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
280 Southridge Drive (0090393-01) | Matrix: Water | Sampled: 2020-09-01 11:30						
Microbiological Parameters						
Microcystin, total	< 0.14	MAC = 1.5	0.14	µg/L	2020-09-11	

REPORTED TO	Okotoks, Town of	**WORK ORDER**	0090393
PROJECT	Schedule 4	**REPORTED**	2020-10-08 13:44

Analysis Description	Method Ref.	Technique	Accredited	Location
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)		Sublet

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MAC	Maximum Acceptable Concentration (health based)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, June 2019)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

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Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted red. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:sgulenchyn@caro.ca

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16. Annual Summary – Incidents reported to AEP

OKOTOKS WT AEP CONTRAVENTIONS 2020 - SUMMARY SHEET							
Date	AENV Ref #	Description	Date/Time	7 Day Letter Complete?	Contravention Date & Time	Location	Additional Details
2020-04-14	365137	Zone 2 failure of distribution flowmeter	April 8, 2020 10:44am	Yes	April 8, 2020 @ 10:44am	Okotoks Zone 2 Reservoir - distribution flowmeter.	Power failure causing the Zone 2 distribution flow meter to stop running. Because of this the flow value was stuck reading at 307 l/s. • 10:44 am Alarm Power failure at zone 2. Got to site found generator running, but the distribution flow meter display was blank. Found distribution flow meter on the HMI stuck reading 307 l/s. Operator then called Fortis. • Fortis on-site around 11:35 am found a line fault in between their poles and the line running underground between the Percy Pegler School and the portables (modular buildings). • Power back up running at 11:50 am. Still having issues with pumps 3,4,6 running then shutting off. • Electrician back at the site around 12:50 pm to troubleshoot the pumps and found phase imbalance's which is causing the pumps to start up then fail after a short period of time. • 1:11 pm Call Fortis back to the site. • 1:50 pm Fortis arrives and finds a second fuse blown further down the line and fixes it, probably should have been found on the first trip out. • Contractor onsite to look into flow flowmeter issues around the same time as Fortis restored normal power. Contractor cycles power on and off to the flow meter and gets a flow reading on HMI but finds the flow meter display head to be no good. He replaces with a used one we had from the WTP and gets the display to start reading again. • 2:05 pm Now back on normal power, we reset pumps 3,4,6. All pumps started up, and the sequencing took back over, and everything looked good. 3:29 pm The Operator confirmed the SCADA is pulling flow numbers for Zone 2 CT Calculation.
2020-09-29	371952	Contravention failed bacteriological sample of 100 Southbank Road.	Sept 23, 2020 @ approximately 11:30am	Yes	Sept 23, 2020 @ approximately 11:30am	100 Southbank Road	Sept 24th, 2020 Bacteriological samples were collected and taken to the Provincial Lab for testing. • One sample collected from the location of the failed sample of Sept 21, 2020 along with one sample downstream of this location and 3 samples upstream of this location. • Sept 25th, 2020 results reported as absent.

OKOTOKS AEP NOTIFICATIONS 2020 - SUMMARY SHEET							
Date	AENV Ref #	Description	Date/Time	7 Day Letter Complete?	Notification Date & Time	Location	Additional Details
2020-05-12	366233	Notification of water service depressurization at 130 Carr Crescent.	May 7, 2020 (2:30pm to 3:30pm) to May 8, 2020 (10:30am to 3:50pm)	Yes	May 7, 2020 @ 2:30pm	130 Carr Crescent	• April 27th 2020, Customer called the Town of Okotoks to notify the water surfacing at curb stop and side walk as well.• Leak found on water service main by leak detection exercise. • Notification to residents (hand delivered notices/face to face) was completed prior to the water main shut down. Approximately 22 residential services were impacted by the temporary service disruption. • The standard operating procedure for restoring water service following a main repair was followed including main flushing and water quality tests. • A bacteriological sample was collected and sent to the Provincial Health Lab for analysis. • Hole in the water service line to 130 Carr Crescent . • Replaced the curb stop, Water service line between curb stop and main and the saddle on the main.
2020-06-23	367801	Notification of water service depressurization at Westridge Close & Westridge Drive.	June 17th 11:45am – 4.30pm	Yes	June 17, 2020 @ 11:45am	Westridge Close & Westridge Drive	• June 16th 2020, during the valve exercising, valve SW-183 found leaking. • Notification to residents (hand delivered notices/face to face) was completed prior to the water main shut down. Approximately 63 residential services were impacted by the temporary service disruption. • The standard operating procedure for restoring water service following a main repair was followed including main flushing and water quality tests. • A bacteriological sample was collected and sent to the Provincial Health Lab for analysis. • Cause-Corrosion due to negative charged soil. • Replaced the valve and necessary fittings with anodes.
2020-07-07	368943	Notification of water service depressurization at Suntree Place (100 block).	July 12, 2020 @ 9:19am	Yes	July 12, 2020 @ 9:19am	100 Block Suntree Place	• July 12th 2020. Called by after hours answering service that 109 Suntree Place was without water. At this time, all of the 100 block of Suntree Place is connected to temporary water off of a hydrant due to construction. Upon arriving on site, found one of the compression fittings was disconnected from the main temporary service pipe. The DCVA attached to the hydrant had it's valves closed (from a resident that noticed the leak). • Contacted Don @ Elite Site Services as he was the contractor in charge of the site. It was decided that he would get his qualified worker and equipment to cleanly re install the temporary service, flush the main temporary service pipe and take a Bac-t sample (#1664757). • Affected residents were notified of the service interruption and advised to flush their cold water lines for 10 – 15 mins after service is restored. They were also advised to contact the Town of Okotoks on call operator if there was any colour, odor or any other concerns about the water quality after flushing. • Once one full change out was flushed through the main temp service line, the Town of Okotoks on call operator sampled the water. Flushing point is at end of line. Cause-• Fitting was incorrectly installed (assumed). • Re-installed fitting and secured site.
2020-08-07	370005	Notification of water service depressurization at 1 Pacific Avenue	Aug 7, 2020 9:00am-2:55apm	Yes	Aug 7, 2020 9:00am	1 Pacific Avenue	•9:00am water shut down to 8 houses and the Okotoks Junior High School. • Notification to residents (hand delivered notices/face to face) was completed prior to the water main shut down. • 2:45pm repairs completed back filled enough to allow us to start flushing. • 2:55pm water turned back on and started flushing out of the nearest hydrant 33 Knight Street. Chlorine and turbidity testing done with results documented. bacti samples collected and sent to lab. The repair was completed and site cleaned up. The standard operating procedure for restoring water service following a main repair was followed including main flushing and water quality tests. Cause-Line depressurization to replace 4 inch main valve and to replace old cast iron water line out to the main with PVC.

17. Annual Operational Summary

January

Jan 1 cell service down – unable to access network computer for data entry etc
Jan 2 WWF flow register stopped working, Brendan determines electronic board needs to be replaced, changes out board for Well 2 and orders new one
Jan 10 lost communication to all stations, work was being done on tower by IT, no notification given to Water Services
Jan 16 cell service down – unable to access network computer for data entry etc
Unit heater #2 by filter 3 failed, facilities accesses and orders parts
Jan 19 SCADA 1 PLC comms lost – values are frozen
Jan 23 cell service down – unable to access network computer for data entry etc
Jan 25 flow totalizer for Zone 4 fails at 8:00am Cima notified

February

Feb 1 ran wells 6 and 8 to prevent freezing as these wells are not being called to run everyday
Feb 2 turned well 2 down was pulling air going down on low level 12l/s to 8.4ls
Feb 3 4 totes chlorine delivered
Feb 4 D/C found leak on hydrant by 128 Hodgson Crescent
Feb 5 D/C fixed leak on hydrant by 128 Hodgson Crescent, polymer system cleaned and flushed, actiflo turbidity meters cleaned and flushed, maintenance repaired unit heater above filter 3 on the west side of the building, ran south reservoir generator
Feb 6 contractor stopped by to have a look at adding double doors to the chlorine room, replaced CL17 analyzer solutions
Feb 11 started training Dain at the WTP, Perla fixing zone 3-4 reports, Johnson Controls onsite to look at HVAC system, submitted AEP on line data ref # 2336176, # 2336178 and # 2336719
Feb 12 having high pressure issues at zone 3-4 CIMA to trouble shoot, Brendan to give us more of a range on the set points
Feb 13 Jay set up WTP SCADA access at WWTP computers for remote login, Neil confirms well 13 UPS is ok, Patti instructed to try and lower coagulant 1.25 from 1.30mgl
Feb 14 Patti lowers coagulant to 1.15 from 1.20mgl, cleaned actiflo turbidity meters
Feb 19 CIMA (Perla) on site to fix reports
Feb 20 Water main break at 109 Stockton Point, 150mm line on private property leaking approximately 2.5 – 3hrs
Feb 21 Main break repaired at 109 Stockton Point by O'Leary Construction
Feb 24 turned coagulant down to 1.00 from 1.10mgl, turned down polymer from .11 to.10mgl
Feb 25 turned down polymer from .10 to 0.09mgl, calibrated online chlorine analyzer at north reservoir
Feb 28 cell 11 trips offline dirty on flow change, cleaned actiflo turbidity meters, seeing turbidity breakthrough on cells 10,11, turbidity spikes being scene on the filter common, AEP annual report sent, computer froze up again at WTP
Feb 29 cells 8 and 12 turbidity bouncing around on flow change close to tripping offline, increased coagulant from 1.10 to 1.20mgl, start on several cells tripping offline dirty as a result of lowering the coagulant and polymer

March

Mar 3 Light switch in sodium hypochlorite room in preparation for construction
Mar 4 Received new sodium hypochlorite totes
Mar 5 Aaron Drilling onsite to replace the pump in Well 2. HEI was lifted the pump tested and the HEI has been put back on
Mar 12 Callout for a high level in the siphon line
Mar 18 Calibration done on the UV Sensors
Mar 24 Suntech on site to adjust the effluent positioning, not opening fast enough after a backwash causing high levels after backwash

Mar 25 Drained and cleaned ACTIFLO #1
Mar 26 Drained and cleaned ACTIFLO #2
Mar 28 SCADA 2 locked up and froze
Mar 30 SCADA is rebooted but does not allow remote access
Mar 31 It corrects remote access problem on SCADA 2

April

Apr Hydrant flushing continues
Apr 8 Phase 3 power alarm at Zone 2, power was hit during construction at the school resulting in the station running on generator power
Apr 14 Contractors on site to start the demolition and installation of new doors for the chlorine room
Apr 14 Suntech on site to work on the dechlor pump, trouble shoot problems with coag sensor in tank #1
Apr 15 Suntech onsite to install the power monitor module and replace soft start at Zone 2
Apr 15 HACH installs demo turbidity meter on Cell 4, Mar 3 Light switch in sodium hypochlorite room in preparation for construction
Apr 15 Chlorine room door is installed
Apr 16 Suntech starts preparing the site for the installation of the new chlorine system
Apr 17 High Country on site to vac out and clean the polymer tanks
Apr 19 The sump in the bathroom has flooded, pumped out, Neil fixes on Monday
Apr 21 Contractors repair holes in cinderblock walls of chlorine room
Apr 21 HEI removed from Well Pump #2
Apr 21 Remote access issues to SCADA, IT onsite to fix
Apr 24 Balzers on site to access removal of chlorine totes
Apr 29 Suntech installs a new breaker in the electrical panel in the MCC room for the chlorine pump system
Apr 29 assessing the power supply alarm, Neil has parts on order

May

May 2 Sump pump high level alarm, breaker reset
May 4 Sump pump failed, breaker could not be reset, portable pump used to clear
May 4 Neil and Pacer replaced the sump pump
May 5 Hydrant flushing in area of Crystal Shores Booster Station created high discharge pressure alarms and the fire pump to start, flushing moved to another area
May 6 Hydrant flushing in area of Crystal Shores Booster Station created high discharge pressure alarms, the fire pump was turned off until the work is completed
May 8 Suntech working on reports, also investigating why when working remotely the connection is lost as soon as an operator in the wtp gets on the computer
May 8 PLC Fault Alarm, Brendan was able to fix remotely
May 12 Neil cleaned pressure relief valves on coagulant pumps and lines associated with this portion of the system
May 13 BCI onsite to install scaffolding
May 14 Cells tripping offline, all cells backwashed
May 15 Cells tripping offline, all cells backwashed
May 17 Cells tripping offline, several cells backwashed – troubleshooting found buildup of coagulant hardening in the piping causing the lines to be blocked
May 19 WTP shut down for chlorine system changeover
May 20 Halo on site to do prep on chlorine room for spill containment
May 20 Suntech on site doing programming and continue with install of wiring to chlorine room
May 21 Halo onsite to continue chlorine room project
May 21 Suntech on site doing programming and continue with install of wiring to chlorine room
May 22 Halo onsite to continue chlorine room project
May 22 Suntech on site to continue with install of wiring to chlorine room
May 23 Suntech on site to continue with install of wiring to chlorine room
May 24 Halo onsite to continue chlorine room project
May 25 Halo onsite to continue chlorine room project

May 26 Halo onsite to continue chlorine room project – patch the floors
May 26 AE Security to look at fire panel issue
May 26 Zone Pump 4 motor fail
May 26 Levels sensors appear to have failed during the lightning strike during the evening

June

June 1 High Country onsite to clean out coagulant totes, WS staff cleaned the lines and strainer and injection points
June 7 Leak repaired on coagulant pump 3
June 8 Facilities on site to do maintenance on HVAC
June 8 Suntech removes wiring to the temporary chlorine pump
June 9 Suntech and Neil onsite to move turbidity meters for Filter 1 C3 and C4
June 10 Zone 2 is shut down and bypassed to install the new flow meter
June 10 Trotter and Morton do repairs to the CCTV
June 12 Frontier performs load test on the generator
June 15 Suntech replaces float in Sheep Cove Lift Station
June 16 Suntech makes adjustments flow at Zone 2
June 17 Balzers onsite to inspect the welds on the filters
June 24 Facilities on site to adjust the temperature and humidity settings in the plant to reduce the pipe condensation
June 27 Leak on chlorine line causing a plant shut down
June 29 UV3 HMI needs to be reset, Suntech unable to do, has a call into Calgon
June 30 Balzers on site to inspect the piping where chlorine leak was

July

July 14 Maintenance department repairs the unit heater in the South Reservoir
July 17 Suntech upgrades programming for the west well field
July 28 Suntech installed transducer in sodium hypochlorite tanks
July 29 Associated engineering onsite doing jar testing
July 30 Suntech installs surge protectors to Wells 7, 8,9,10

August

Aug 3 the check valve in the line to the overland channel pipe is allowing water to seep past it into the channel – the valve has been closed and locked out along with installing a pneumatic plug at the end of the pipe to prevent water getting into the channel.
Aug 10 Chlorine delivery – Suntech adjusts the values and set points in SCADA to the new totes – full and operating levels.
Aug 12 Facilities maintenance on site to replace filters in HVAC
Aug 13 Suntech and Chubb perform test in new fire alarm pull and certify operation
Aug 16 River monitoring – river flow falls below IO's and remains as such through the month of Aug
Aug 16 Wells 3, 6 and 12 are going on low level – adjustments made to flow control
Aug 18 Wells 4,6,8 and 12 are going on low level – adjustments made to flow control
Aug 18 UV #1 fault – failure Dosing increased from 20 mj/m^3 to 30 mj/m^3
Aug 20 North reservoir low level alarm – bypass interlocks and turns on transfer pumps
Aug 21 Cell 2 turbidity analyzer failed, reporting a zero result - HACH request for service submitted
Aug 25 Additional "no trespassing" signs installed around the water plant
Aug 30 UV1 failure - offline
Aug 31 UV 1 ballast replaced and back online, adjustments made to flow control of the wells frequently during this month due to extreme heat and high water demand

September

Sept 1 Coagulant turned down from 0.70mg/L to 0.60mg/L
Sept 6 South Reservoir P5 drive fault alarm
Sept 9 Suntech repairs P5 drive fault
Sept 10 HACH service tech repairs Cell 2 turb meter
Sept 1 Coagulant turned down from 0.60mg/L to 0.50mg/L
O'Leary Contractors install T fitting, hoses and geotube bags into overland channel outlet pipe
Sept 17 Suntech changes Zone 2 meter to pulse readings
Sept 21 Aaron Drilling doing well inspections
Sept 22 pumping to overland channel
Sept 25 Coag not able to pump to raw water lines, injectors are plugged. Temporary solution installed to get system working until injectors could be cleaned and put back into place. New injectors are on order and have not arrived
Sept 26 Chlorine residual in South Reservoir dropped to 0.35mg/L, increased chlorine dosage and threw sodium hypo into hatch to raise residual
Sept 28 coag injectors cleaned and reinstalled
Sept 29 problems maintaining chlorine residual in South Reservoir, water coming up[outside along the south wall of the water plant
Sept 30 all flow going directly to the overland channel, the system that O'Leary installed has been disconnected. Filter to waste tank is drained and should be inspected for cracks.

October

Oct 1 bypassing flow from geotubes into the overland channel. Geotubes are backing
Oct 1 Drain ftw tank to access for leaks and cracks
Oct 5 during the third backwash of the day, water started coming out of the ground along the south wall of the wtp
Oct 5 the T fitting from the overland channel is remove as its causing backup issues
Oct 7 Install baskets in all filter bw troughs and at the overland channel outlet for de-chlor pucks
Oct 7 Decrease backwash time from 48hrs to 72 hrs
Oct 14 pump down level of bw tank for inspection
Oct 15 Contractor onsite to clean backwash tank and remove old pump
Oct 15 new backwash pump installed
Oct 16 Contractor finishes cleaning the backwash tanks and inspects
Oct 18 Coagulant injectors plugging off
Oct 23 Installation of inline UVT analyzer
Oct 26 Contractor cameras overland channel piping
Oct 27 Contractor installs power to UVT analyzer
Oct 27 E&H onsite to calibrate South Reservoir flow meter
Oct 29 Plant shut down to install new PLC card, new card is defective, old card reinstalled, creates set point issues, reviewed and corrected
Oct 29 Installation of new UV HMI card is unsuccessful, compatibility issues with cables
Oct 29 new coagulant injectors installed
Oct 31 PLC communication failures with Brendan on site to troubleshoot, overnight shift in place

November

Nov 10 Cells in Filter 2 are operating on high level. Overflowing the troughs and filling the filter to waste tank
Nov 10 Suntech on site to calibrate settings on Filter 2 ftw and effluent valves
Nov 11 Cells in Filter 2 are operating on high level. Trouble shooting the problem is ongoing
Nov 13 Suntech repairs level indicator on Well 12
Nov 16 lower levels in Filter 2 cells prior to backwashing and increase air scour time, while Suntech observes and adjust ftw and effluent valves during the backwash
Nov 16 Suntech installs new HMI's on UV2 and UV3
Nov 16 AE on site to review Stress Test
Nov 17 Suntech installs new HMI on UV1
Nov 17 CRS Cranes onsite performing annual inspection on all cranes, davit arms and hoists
Nov 20 Pressure sensors installed on Filter 1 all cells
Nov 23 HACH onsite to calibrate analyzers, turbidity meters, probes and lab instruments
Nov 23 Trotter Morton on site to repair cameras
Nov 24 Cell 5 and 7 test, lower water in cell, air scour, add sodium hypo let stand for an hour, air scour, than backwash, trying to clean up clean, noted intermixing, increased cell loading with low run time hours
Nov 25 Cell 8 – follow procedure from Cell 5 and 7
Nov 25 Suntech installs new computer card in PLC
Nov 25 Balzers on site to access and develop a plan to support Filter 3 to mitigate movement

December

Dec 1 Cleaning of media buildup in filter 2 begins, process to drop level, air scour, add sodium hypo and backwash
Dec 3 HACH onsite to replace electronic board on ACTIFLO turbidity meter 1
Dec 7 Lowered reservoir levels in preparation of stress test
Dec 9 Stress testing begins and to continue over the next 3 days
Dec 12 Balzers onsite to grout Filter 3
Dec 17 HACH onsite to fix ACTIFLO turbidity meter 1 and lab turbidity meter
Dec 21 chlorine line plumbing being done, lights and ballasts being replaced
Dec 21 noted that coagulant injectors have been plugging off since Dec 18. Injectors are pulled apart and cleaned.
Dec 27 Well staging changed and flow rates on some wells adjusted
Dec 30 IT working to improve access to HACH WIMS through the VPN

18. Operator Certification

As required under section 4.2 of Approval No. 1029-03-00, the water treatment facility is classified as **Class III** and the water distribution system is classified as **Class III**. The facilities are classified in accordance with the *Water and Wastewater Operators' Certification Guidelines.*

As per approval section 4.2.3, the operation of the water treatment facility shall be performed by, or under the direction of:

a) An operator who holds a valid Level III (or higher) Water Treatment Operators Certificate of qualification; and
b) At least one other operator who holds a valid Level II (or higher) Water Treatment Operators Certificate

As per approval section 4.2.4, the operation of the water distribution system shall be performed by, or under the direction of:

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

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

Name	Position	Water Treatment	Water Distribution	Cert. Number
Pacer Wilson	Lead hand	Level 3	Level 4	2956
Patti Kjinserdahl	Operator	Level 3	Level 2	2429
Bryan Steed	Operator	Level 3	Level 4	2292
Dain Perrier	Operator	Level 3	Level 2	4843
Jordan Ballard	Operator	Level 1	Level 1	3714
Marlon Anthony	Operator	Level 2	Level 2	4944
James McElmon	Operator	N/A	Level 2	4045
Terry Sapsford	Operator	N/A	Level 2	4318
Johnathan Bartisch	Operator	N/A	Level 1	2944
The Operator listed below are no longer at this site				
Kyle Cherkas	Operator in Training	Operator in Training	Operator in Training	End Date April 2020

Site Manager Contact Information:

Rakesh Savani
Water Services Site Manager
Okotoks Water Services
200 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Bus: (403) 938-1230
Cell: (587) 432-6448
Email: rsavani@okotoks.ca

Supervising Operator Contact Information:

Pacer Wilson
Water Services Lead Hand Operator
Okotoks Water Services Inc.
200 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Bus: (403) 938-1230
Cell: (403) 899-6349
Email: pwilson@okotoks.ca

19. Operations Program

Updates were made to the Operations Manual.
Contact information, ERP updates, SOP's updates.

20. Drinking Water Safety Plan

The Town of Okotoks & EWSI have reviewed and updated the DWSP and made the following changes.

1. Population, length of distribution line, increased the number of service connections, upgrade to Zone 3-4 Reservoir, risks reviewed and updated.

21. Lead Program

1. **Lead mitigation plan including program successes for the reporting year**.

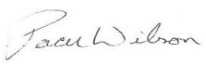
   In 2020 Okotoks took on the initial phase of the AEP program to manage lead in municipal drinking water supplies. This included a review of current infrastructure and targeted testing based on the most qualified areas. As the Town of Okotoks is lead free in its public infrastructure the testing was used to help identify possible issue areas where private water supplies would most likely have lead present. This is based off the age of piping, age of building construction and the age of the water in the system (distance from the treatment plant). Upon completing 60+ tests all but 1 building was above the MAC (0.005 micrograms/L). Upon further review the building was determined to have very little water usage and was built in the early 1900's. When retested the building was below the MAC. A filter was recommended on that system to remove lead contents and was successfully implemented. These results gave us further confidence in our distribution system and the quality of our public infrastructure.

2. **Next steps expected for the following year.**

   As the next step, the Town of Okotoks is looking for the AEP rollout of the Phase 2 guidelines.

3. **All addresses sampled and lead results will be reported annually as a separate electronic excel file with the Annual Water Operations Report.**

22. Supervising Operator

Reviewed / Approved	Supervising Operator	
	**Pacer Wilson**	**2956**
Signature	Printed	Certificate #

Reviewed	Water Services Manager
	Rakesh Savani
Signature	Printed

Report prepared by: Patti Kjinserdahl

Date: Feb 28, 2021