



## CERTIFICATE OF ANALYSIS

**REPORTED TO** Mid Shuswap Lumby Water Stewards  
1631 Mable Lake Rd  
Lumby, BC V0E 2G6

**ATTENTION** Russ Collins

**PO NUMBER** Mid Shuswap Lumby Water Stewards  
**PROJECT** Analytical Testing

**PROJECT INFO**

**WORK ORDER** 9080828

**RECEIVED / TEMP** 2019-08-12 08:55 / 12°C  
**REPORTED** 2019-08-16 11:15

**COC NUMBER** No Number

### Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

#### *Big Picture Sidekicks*



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

#### *We've Got Chemistry*



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

#### *Ahead of the Curve*



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

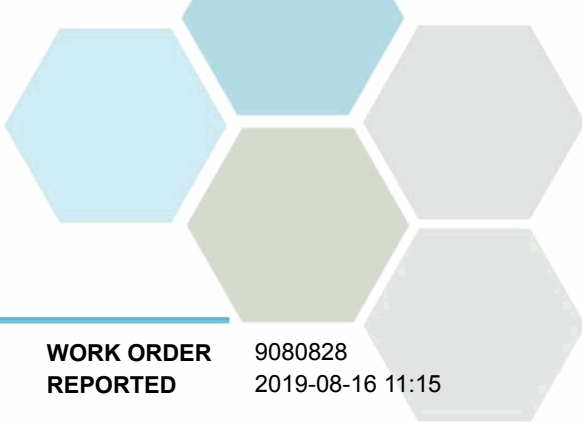
If you have any questions or concerns, please contact me at [teamcaro@caro.ca](mailto:teamcaro@caro.ca)

### Authorized By:

Team CARO  
Client Service Representative

1-888-311-8846 | [www.caro.ca](http://www.caro.ca)

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7



# TEST RESULTS

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards Analytical Testing

**WORK ORDER REPORTED** 9080828  
2019-08-16 11:15

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Harris Creek (Hwy 6) (9080828-01)   Matrix: Water   Sampled: 2019-08-11 11:40</b>						<b>FILT, PRES</b>

**Anions**

Chloride	2.60	AO ≤ 250	0.10	mg/L	2019-08-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2019-08-13	
Sulfate	18.7	AO ≤ 500	1.0	mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.255	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	0.077	None Required	0.020	mg/L	2019-08-12	
Conductivity (EC)	227	N/A	2.0	µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	0.255	N/A	0.050	mg/L	2019-08-13	
pH	7.89	7.0-10.5	0.10	pH units	2019-08-12	HT2
Phosphorus, Total (as P)	0.0348	N/A	0.0020	mg/L	2019-08-15	
Phosphorus, Total Dissolved	0.0270	N/A	0.0020	mg/L	2019-08-15	
Turbidity	1.06	OG < 1	0.10	NTU	2019-08-12	

**Microbiological Parameters**

Coliforms, Total	≥ 2400	MAC = 0	1	CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200	CFU/100 mL	2019-08-12	
E. coli	≥ 1000	MAC = 0	1	CFU/100 mL	2019-08-12	

**Duteau Creek (Hwy 6) (9080828-02) | Matrix: Water | Sampled: 2019-08-11 11:25**

**FILT, PRES**

**Anions**

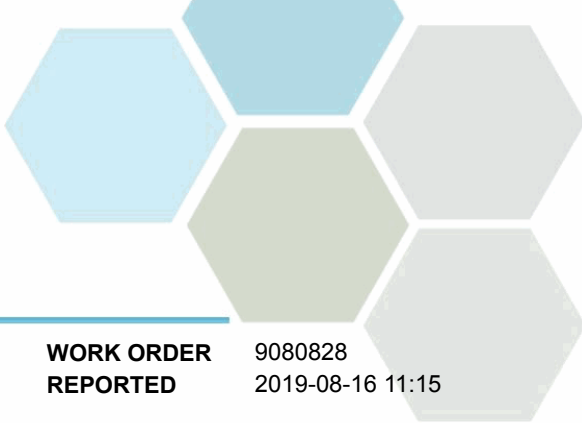
Chloride	4.57	AO ≤ 250	0.10	mg/L	2019-08-13	
Nitrate (as N)	0.283	MAC = 10	0.010	mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2019-08-13	
Sulfate	13.3	AO ≤ 500	1.0	mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.283	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.556	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	0.099	None Required	0.020	mg/L	2019-08-12	
Conductivity (EC)	162	N/A	2.0	µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	0.273	N/A	0.050	mg/L	2019-08-13	
pH	7.73	7.0-10.5	0.10	pH units	2019-08-12	HT2
Phosphorus, Total (as P)	0.0273	N/A	0.0020	mg/L	2019-08-15	
Phosphorus, Total Dissolved	0.0166	N/A	0.0020	mg/L	2019-08-15	
Turbidity	1.48	OG < 1	0.10	NTU	2019-08-12	



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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Duteau Creek (Hwy 6) (9080828-02)   Matrix: Water   Sampled: 2019-08-11 11:25, Continued</b>						FILT, PRES

**Microbiological Parameters**

Coliforms, Total	≥ 2400	MAC = 0	1	CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200	CFU/100 mL	2019-08-12	
E. coli	210	MAC = 0	1	CFU/100 mL	2019-08-12	

**Mid Bessette Creek (9080828-03) | Matrix: Water | Sampled: 2019-08-11 10:46**

FILT, PRES

**Anions**

Chloride	6.93	AO ≤ 250	0.10	mg/L	2019-08-13	
Nitrate (as N)	0.142	MAC = 10	0.010	mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2019-08-13	
Sulfate	24.9	AO ≤ 500	1.0	mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.142	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.383	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	0.075	None Required	0.020	mg/L	2019-08-12	
Conductivity (EC)	257	N/A	2.0	µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	0.241	N/A	0.050	mg/L	2019-08-13	
pH	7.98	7.0-10.5	0.10	pH units	2019-08-12	HT2
Phosphorus, Total (as P)	0.0227	N/A	0.0020	mg/L	2019-08-15	
Phosphorus, Total Dissolved	0.0115	N/A	0.0020	mg/L	2019-08-15	
Turbidity	1.77	OG < 1	0.10	NTU	2019-08-12	

**Microbiological Parameters**

Coliforms, Total	≥ 3200	MAC = 0	1	CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200	CFU/100 mL	2019-08-12	
E. coli	560	MAC = 0	1	CFU/100 mL	2019-08-12	

**Lower Bessette Creek (9080828-04) | Matrix: Water | Sampled: 2019-08-11 10:35**

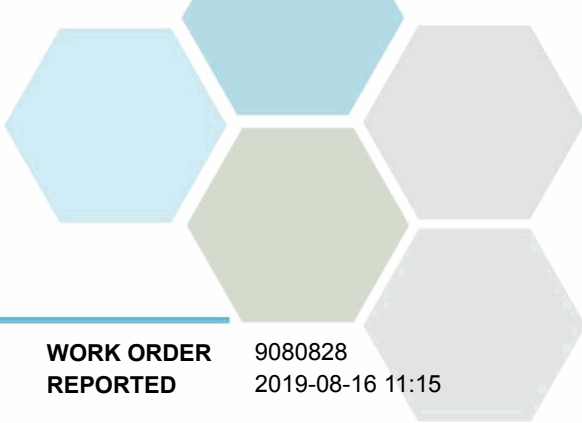
FILT, PRES

**Anions**

Chloride	7.90	AO ≤ 250	0.10	mg/L	2019-08-13	
Nitrate (as N)	0.125	MAC = 10	0.010	mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2019-08-13	
Sulfate	28.7	AO ≤ 500	1.0	mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.125	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.383	N/A	0.0500	mg/L	N/A	



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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Lower Bessette Creek (9080828-04)   Matrix: Water   Sampled: 2019-08-11 10:35, Continued</b>					<b>FILT, PRES</b>

**General Parameters**

Ammonia, Total (as N)	0.086	None Required	0.020 mg/L	2019-08-12	
Conductivity (EC)	285	N/A	2.0 µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	0.258	N/A	0.050 mg/L	2019-08-13	
pH	8.14	7.0-10.5	0.10 pH units	2019-08-12	HT2
Phosphorus, Total (as P)	0.0316	N/A	0.0020 mg/L	2019-08-15	
Phosphorus, Total Dissolved	0.0146	N/A	0.0020 mg/L	2019-08-15	
Turbidity	2.79	OG < 1	0.10 NTU	2019-08-12	

**Microbiological Parameters**

Coliforms, Total	≥ 1700	MAC = 0	1 CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200 CFU/100 mL	2019-08-12	
E. coli	340	MAC = 0	1 CFU/100 mL	2019-08-12	

**Shuswap River (Odd Fellows) (9080828-05) | Matrix: Water | Sampled: 2019-08-11 09:20**

**FILT, PRES**

**Anions**

Chloride	0.68	AO ≤ 250	0.10 mg/L	2019-08-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2019-08-13	
Sulfate	7.7	AO ≤ 500	1.0 mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.111	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	0.082	None Required	0.020 mg/L	2019-08-12	
Conductivity (EC)	117	N/A	2.0 µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	0.111	N/A	0.050 mg/L	2019-08-13	
pH	7.81	7.0-10.5	0.10 pH units	2019-08-12	HT2
Phosphorus, Total (as P)	0.0129	N/A	0.0020 mg/L	2019-08-15	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020 mg/L	2019-08-15	
Turbidity	0.63	OG < 1	0.10 NTU	2019-08-12	

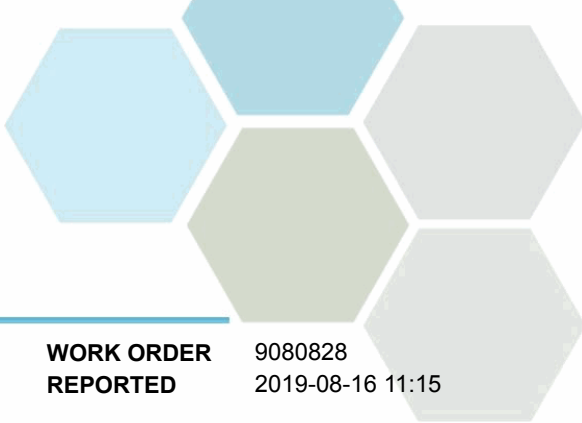
**Microbiological Parameters**

Coliforms, Total	≥ 920	MAC = 0	1 CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200 CFU/100 mL	2019-08-12	
E. coli	54	MAC = 0	1 CFU/100 mL	2019-08-12	

**Shuswap River (Wilsey Dam) (9080828-06) | Matrix: Water | Sampled: 2019-08-11 10:10**

**FILT, PRES**

**Anions**



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**WORK ORDER REPORTED** 9080828  
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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Shuswap River (Wilsey Dam) (9080828-06)   Matrix: Water   Sampled: 2019-08-11 10:10, Continued</b>					<b>FILT, PRES</b>

**Anions, Continued**

Chloride	<b>0.42</b>	AO ≤ 250	0.10 mg/L	2019-08-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2019-08-13	
Sulfate	<b>6.6</b>	AO ≤ 500	1.0 mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	<b>0.0980</b>	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	<b>0.051</b>	None Required	0.020 mg/L	2019-08-12	
Conductivity (EC)	<b>105</b>	N/A	2.0 µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	<b>0.098</b>	N/A	0.050 mg/L	2019-08-13	
pH	<b>7.72</b>	7.0-10.5	0.10 pH units	2019-08-12	HT2
Phosphorus, Total (as P)	<b>0.0071</b>	N/A	0.0020 mg/L	2019-08-15	
Phosphorus, Total Dissolved	<b>0.0025</b>	N/A	0.0020 mg/L	2019-08-15	
Turbidity	<b>0.45</b>	OG < 1	0.10 NTU	2019-08-12	

**Microbiological Parameters**

Coliforms, Total	<b>1500</b>	MAC = 0	1 CFU/100 mL	2019-08-12	
Background Colonies	<b>&gt; 200</b>	N/A	200 CFU/100 mL	2019-08-12	
E. coli	<b>56</b>	MAC = 0	1 CFU/100 mL	2019-08-12	

**Vance Creek (Mabel Lake Road) (9080828-07) | Matrix: Water | Sampled: 2019-08-11 11:08**

**FILT, PRES**

**Anions**

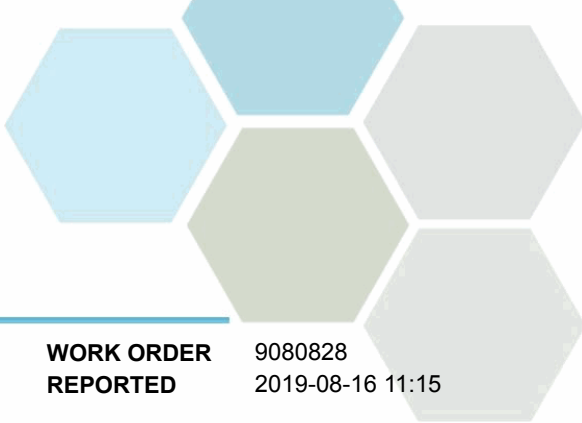
Chloride	<b>3.19</b>	AO ≤ 250	0.10 mg/L	2019-08-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2019-08-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2019-08-13	
Sulfate	<b>36.5</b>	AO ≤ 500	1.0 mg/L	2019-08-13	

**Calculated Parameters**

Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	<b>0.118</b>	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	<b>0.061</b>	None Required	0.020 mg/L	2019-08-12	
Conductivity (EC)	<b>395</b>	N/A	2.0 µS/cm	2019-08-12	
Nitrogen, Total Kjeldahl	<b>0.118</b>	N/A	0.050 mg/L	2019-08-13	
pH	<b>8.25</b>	7.0-10.5	0.10 pH units	2019-08-12	HT2
Phosphorus, Total (as P)	<b>0.0091</b>	N/A	0.0020 mg/L	2019-08-15	
Phosphorus, Total Dissolved	<b>0.0022</b>	N/A	0.0020 mg/L	2019-08-15	
Turbidity	<b>1.32</b>	OG < 1	0.10 NTU	2019-08-12	



## TEST RESULTS

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Analytical Testing

**WORK ORDER REPORTED** 9080828  
2019-08-16 11:15

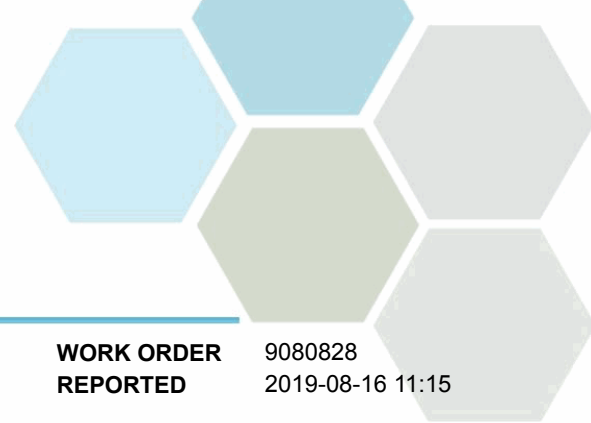
Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Vance Creek (Mabel Lake Road) (9080828-07)   Matrix: Water   Sampled: 2019-08-11 11:08, Continued</b>						FILT, PRES

**Microbiological Parameters**

Coliforms, Total	≥ 860	MAC = 0	1	CFU/100 mL	2019-08-12	
Background Colonies	> 200	N/A	200	CFU/100 mL	2019-08-12	
E. coli	96	MAC = 0	1	CFU/100 mL	2019-08-12	

**Sample Qualifiers:**

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards  
Analytical Testing

**WORK ORDER REPORTED** 9080828  
2019-08-16 11:15

Analysis Description	Method Ref.	Technique	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Coliforms, Total in Water	SM 9222 B (2017)	Membrane Filtration / m-Endo Agar	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Kelowna
E. coli in Water	SM 9222 G (2017)	Membrane Filtration / Nutrient Agar with MUG	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Turbidity in Water	SM 2130 B (2017)	Nephelometry	Kelowna

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

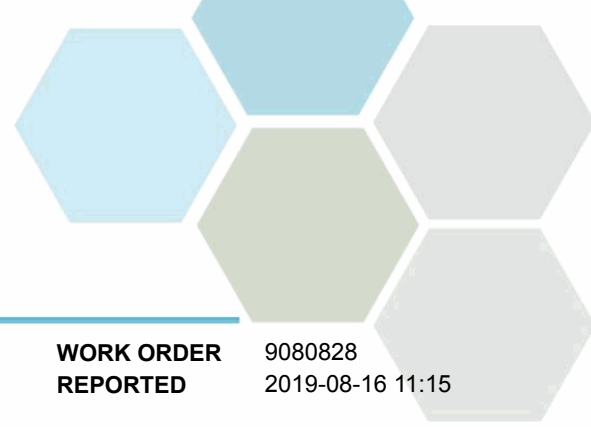
### Glossary of Terms:

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
>	Greater than the specified Result
>=	Greater than or equal to the specified Result
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
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
µS/cm	Microsiemens per centimetre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

### 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*



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**REPORTED TO** Mid Shuswap Lumby Water Stewards  
**PROJECT** Analytical Testing

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**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: [teamcaro@caro.ca](mailto:teamcaro@caro.ca)