



## 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** 8111572

**RECEIVED / TEMP** 2018-11-20 12:00 / 7°C  
**REPORTED** 2018-11-26 13:15

**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.

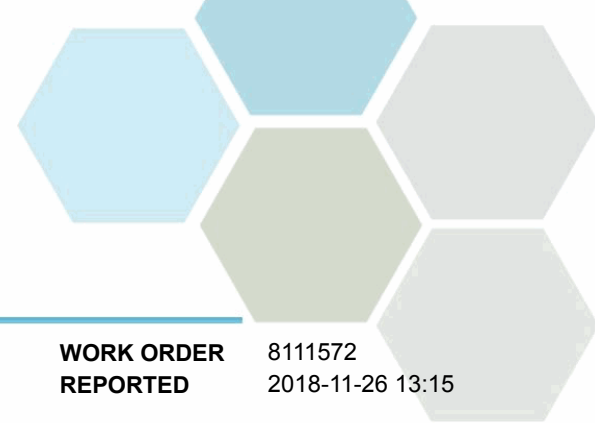
If you have any questions or concerns, please contact me at [estclair@caro.ca](mailto:estclair@caro.ca)

#### Authorized By:

Eilish St.Clair, B.Sc., C.I.T.  
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

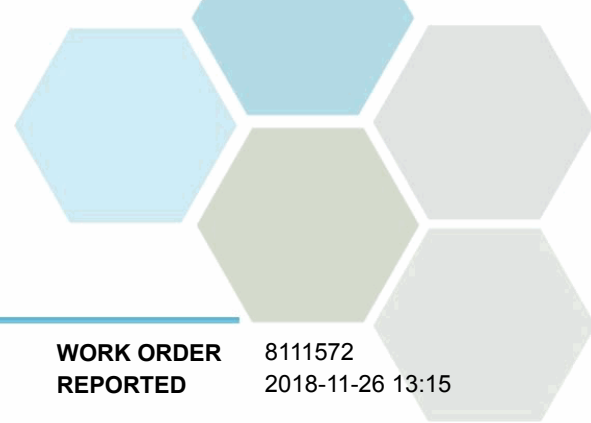
**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards Analytical Testing

**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Harris Creek (Hwy 6) (8111572-01)   Matrix: Water   Sampled: 2018-11-18 10:55</b>					
<b>Anions</b>					
Chloride	3.75	AO ≤ 250	0.10 mg/L	2018-11-21	
Nitrate (as N)	0.051	MAC = 10	0.010 mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-11-21	
Sulfate	25.9	AO ≤ 500	1.0 mg/L	2018-11-21	
<b>Calculated Parameters</b>					
Nitrate+Nitrite (as N)	0.0506	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.219	N/A	0.0500 mg/L	N/A	
<b>General Parameters</b>					
Ammonia, Total (as N)	0.025	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	230	N/A	2.0 μS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	0.168	N/A	0.050 mg/L	2018-11-21	
pH	7.90	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	0.0221	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	0.0176	N/A	0.0020 mg/L	2018-11-22	
Turbidity	1.07	OG < 1	0.10 NTU	2018-11-21	
<b>Microbiological Parameters</b>					
Coliforms, Total	140	MAC = 0	1 CFU/100 mL	2018-11-21	HT1
Background Colonies	> 200	N/A	200 CFU/100 mL	2018-11-21	HT1
E. coli	50	MAC = 0	1 CFU/100 mL	2018-11-21	HT1

**Duteau Creek (Hwy 6) (8111572-02) | Matrix: Water | Sampled: 2018-11-18 10:45**

<b>Anions</b>					
Chloride	10.3	AO ≤ 250	0.10 mg/L	2018-11-21	
Nitrate (as N)	0.838	MAC = 10	0.010 mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-11-21	
Sulfate	47.9	AO ≤ 500	1.0 mg/L	2018-11-21	
<b>Calculated Parameters</b>					
Nitrate+Nitrite (as N)	0.838	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	1.09	N/A	0.0500 mg/L	N/A	
<b>General Parameters</b>					
Ammonia, Total (as N)	0.034	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	332	N/A	2.0 μS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	0.248	N/A	0.050 mg/L	2018-11-21	
pH	8.00	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	0.0115	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	0.0079	N/A	0.0020 mg/L	2018-11-22	
Turbidity	0.83	OG < 1	0.10 NTU	2018-11-21	



## TEST RESULTS

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

**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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### Duteau Creek (Hwy 6) (8111572-02) | Matrix: Water | Sampled: 2018-11-18 10:45, Continued

#### Microbiological Parameters

Coliforms, Total	<b>80</b>	MAC = 0	1	CFU/100 mL	2018-11-21	HT1
Background Colonies	> <b>200</b>	N/A	200	CFU/100 mL	2018-11-21	HT1
E. coli	<b>7</b>	MAC = 0	1	CFU/100 mL	2018-11-21	HT1

### Mid Bessette Creek (8111572-03) | Matrix: Water | Sampled: 2018-11-18 10:20

#### Anions

Chloride	<b>7.06</b>	AO ≤ 250	0.10	mg/L	2018-11-21	
Nitrate (as N)	<b>0.288</b>	MAC = 10	0.010	mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2018-11-21	
Sulfate	<b>39.5</b>	AO ≤ 500	1.0	mg/L	2018-11-21	

#### Calculated Parameters

Nitrate+Nitrite (as N)	<b>0.288</b>	N/A	0.0100	mg/L		N/A
Nitrogen, Total	<b>0.463</b>	N/A	0.0500	mg/L		N/A

#### General Parameters

Ammonia, Total (as N)	<b>0.056</b>	None Required	0.020	mg/L	2018-11-21	
Conductivity (EC)	<b>306</b>	N/A	2.0	µS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	<b>0.175</b>	N/A	0.050	mg/L	2018-11-21	
pH	<b>8.05</b>	7.0-10.5	0.10	pH units	2018-11-21	HT2
Phosphorus, Total (as P)	<b>0.0211</b>	N/A	0.0020	mg/L	2018-11-22	
Phosphorus, Total Dissolved	<b>0.0135</b>	N/A	0.0020	mg/L	2018-11-22	
Turbidity	<b>1.24</b>	OG < 1	0.10	NTU	2018-11-21	

#### Microbiological Parameters

Coliforms, Total	<b>260</b>	MAC = 0	1	CFU/100 mL	2018-11-21	HT1
Background Colonies	> <b>200</b>	N/A	200	CFU/100 mL	2018-11-21	HT1
E. coli	<b>60</b>	MAC = 0	1	CFU/100 mL	2018-11-21	HT1

### Lower Bessette Creek (8111572-04) | Matrix: Water | Sampled: 2018-11-18 10:05

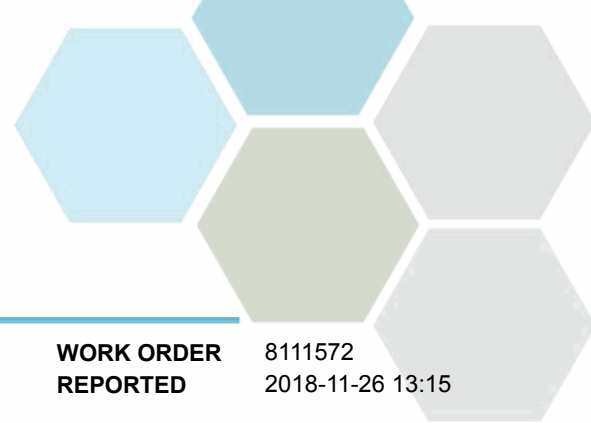
#### Anions

Chloride	<b>7.24</b>	AO ≤ 250	0.10	mg/L	2018-11-21	
Nitrate (as N)	<b>0.289</b>	MAC = 10	0.010	mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2018-11-21	
Sulfate	<b>43.0</b>	AO ≤ 500	1.0	mg/L	2018-11-21	

#### Calculated Parameters

Nitrate+Nitrite (as N)	<b>0.289</b>	N/A	0.0100	mg/L		N/A
Nitrogen, Total	<b>0.492</b>	N/A	0.0500	mg/L		N/A

#### General Parameters



# TEST RESULTS

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**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Lower Bessette Creek (8111572-04)   Matrix: Water   Sampled: 2018-11-18 10:05, Continued</b>					
<i>General Parameters, Continued</i>					
Ammonia, Total (as N)	0.048	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	321	N/A	2.0 µS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	0.203	N/A	0.050 mg/L	2018-11-21	
pH	8.08	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	0.0197	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	0.0149	N/A	0.0020 mg/L	2018-11-22	
Turbidity	1.52	OG < 1	0.10 NTU	2018-11-21	

*Microbiological Parameters*

Coliforms, Total	160	MAC = 0	1 CFU/100 mL	2018-11-21	HT1
Background Colonies	> 200	N/A	200 CFU/100 mL	2018-11-21	HT1
E. coli	91	MAC = 0	1 CFU/100 mL	2018-11-21	HT1

**Shuswap River (Odd Fellows) (8111572-05) | Matrix: Water | Sampled: 2018-11-18 10:00**

*Anions*

Chloride	0.91	AO ≤ 250	0.10 mg/L	2018-11-21	
Nitrate (as N)	0.049	MAC = 10	0.010 mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-11-21	
Sulfate	9.5	AO ≤ 500	1.0 mg/L	2018-11-21	

*Calculated Parameters*

Nitrate+Nitrite (as N)	0.0487	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	< 0.0500	N/A	0.0500 mg/L	N/A	

*General Parameters*

Ammonia, Total (as N)	0.031	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	126	N/A	2.0 µS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050 mg/L	2018-11-21	
pH	7.83	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	0.0100	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020 mg/L	2018-11-22	
Turbidity	2.67	OG < 1	0.10 NTU	2018-11-21	

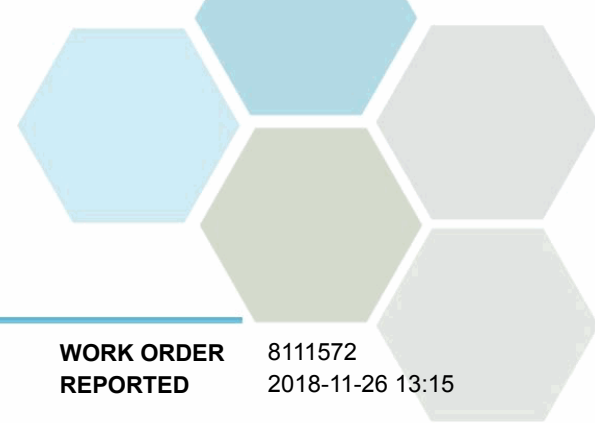
*Microbiological Parameters*

Coliforms, Total	240	MAC = 0	1 CFU/100 mL	2018-11-21	HT1
Background Colonies	> 200	N/A	200 CFU/100 mL	2018-11-21	HT1
E. coli	23	MAC = 0	1 CFU/100 mL	2018-11-21	HT1

**Shuswap River (Wilsey Dam) (8111572-06) | Matrix: Water | Sampled: 2018-11-18 09:45**

*Anions*

Chloride	0.44	AO ≤ 250	0.10 mg/L	2018-11-21	
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# TEST RESULTS

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

**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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**Shuswap River (Wilsey Dam) (8111572-06) | Matrix: Water | Sampled: 2018-11-18 09:45, Continued**

**Anions, Continued**

Nitrate (as N)	0.043	MAC = 10	0.010 mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-11-21	
Sulfate	6.5	AO ≤ 500	1.0 mg/L	2018-11-21	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.0427	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	< 0.0500	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	102	N/A	2.0 µS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050 mg/L	2018-11-21	
pH	7.76	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	< 0.0020	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020 mg/L	2018-11-22	
Turbidity	0.57	OG < 1	0.10 NTU	2018-11-21	

**Microbiological Parameters**

Coliforms, Total	22	MAC = 0	1 CFU/100 mL	2018-11-21	HT1
Background Colonies	> 200	N/A	200 CFU/100 mL	2018-11-21	HT1
E. coli	< 1	MAC = 0	1 CFU/100 mL	2018-11-21	HT1

**Vance Creek (Mabel Lake Road) (8111572-07) | Matrix: Water | Sampled: 2018-11-18 10:30**

**Anions**

Chloride	2.92	AO ≤ 250	0.10 mg/L	2018-11-21	
Nitrate (as N)	0.071	MAC = 10	0.010 mg/L	2018-11-21	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-11-21	
Sulfate	38.2	AO ≤ 500	1.0 mg/L	2018-11-21	

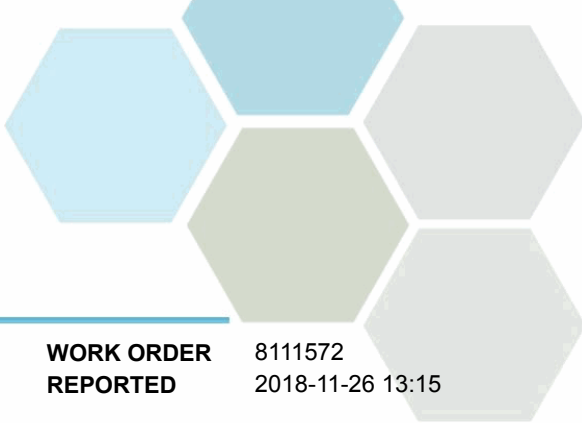
**Calculated Parameters**

Nitrate+Nitrite (as N)	0.0708	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.0708	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2018-11-21	
Conductivity (EC)	384	N/A	2.0 µS/cm	2018-11-21	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050 mg/L	2018-11-21	
pH	8.26	7.0-10.5	0.10 pH units	2018-11-21	HT2
Phosphorus, Total (as P)	< 0.0020	N/A	0.0020 mg/L	2018-11-22	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020 mg/L	2018-11-22	
Turbidity	1.25	OG < 1	0.10 NTU	2018-11-21	

**Microbiological Parameters**



## TEST RESULTS

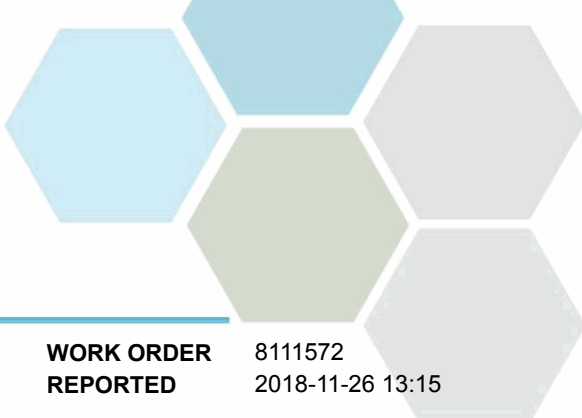
**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards  
Analytical Testing

**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Vance Creek (Mabel Lake Road) (8111572-07)   Matrix: Water   Sampled: 2018-11-18 10:30, Continued</b>						
<i>Microbiological Parameters, Continued</i>						
Coliforms, Total	≥ 11	MAC = 0	1	CFU/100 mL	2018-11-21	HT1
Background Colonies	> 200	N/A	200	CFU/100 mL	2018-11-21	HT1
E. coli	< 1	MAC = 0	1	CFU/100 mL	2018-11-21	HT1

**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.



## APPENDIX 1: SUPPORTING INFORMATION

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

**WORK ORDER REPORTED** 8111572  
2018-11-26 13:15

Analysis Description	Method Ref.	Technique	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2011)	Automated Colorimetry (Phenate)	Kelowna
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Kelowna
Coliforms, Total in Water	SM 9222 B (2006)	Membrane Filtration / m-Endo Agar	Kelowna
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Kelowna
E. coli in Water	SM 9222 G (2006)	Membrane Filtration / Nutrient Agar with MUG	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2011)	Block Digestion and Flow Injection Analysis	Kelowna
pH in Water	SM 4500-H+ B (2011)	Electrometry	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2011)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2011)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Turbidity in Water	SM 2130 B (2011)	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*

### 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. The quality control (QC) data is available upon request