



## 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** 23H1811

**RECEIVED / TEMP** 2023-08-14 09:41 / 4.1°C  
**REPORTED** 2023-08-21 11:35

### 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/IEC 17025:2017 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.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: <https://www.caro.ca/terms-conditions>

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 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



# TEST RESULTS

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

**Harris Creek (HWY 6) (23H1811-01) | Matrix: Water | Sampled: 2023-08-13 10:55**

**Anions**

Chloride	3.17	AO ≤ 250	0.10	mg/L	2023-08-15	
Nitrate (as N)	0.020	MAC = 10	0.010	mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-08-15	
Sulfate	22.1	AO ≤ 500	1.0	mg/L	2023-08-15	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.0195	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.188	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2023-08-15	
Conductivity (EC)	269	N/A	2.0	µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.168	N/A	0.050	mg/L	2023-08-16	
pH	7.98	7.0-10.5	0.10	pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0423	N/A	0.0050	mg/L	2023-08-16	
Phosphorus, Total Dissolved	0.0283	N/A	0.0050	mg/L	2023-08-16	
Turbidity	1.41	OG < 1	0.10	NTU	2023-08-15	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	2350	MAC = 0	1	MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	293	N/A	1	MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	293	MAC = 0	1	MPN/100 mL	2023-08-14	

**Duteau Creek (HWY 6) (23H1811-02) | Matrix: Water | Sampled: 2023-08-13 11:05**

**Anions**

Chloride	4.51	AO ≤ 250	0.10	mg/L	2023-08-15	
Nitrate (as N)	0.239	MAC = 10	0.010	mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-08-15	
Sulfate	14.1	AO ≤ 500	1.0	mg/L	2023-08-15	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.239	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.551	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2023-08-15	
Conductivity (EC)	152	N/A	2.0	µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.312	N/A	0.050	mg/L	2023-08-16	
pH	7.83	7.0-10.5	0.10	pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0246	N/A	0.0050	mg/L	2023-08-16	
Phosphorus, Total Dissolved	0.0191	N/A	0.0050	mg/L	2023-08-16	
Turbidity	1.31	OG < 1	0.10	NTU	2023-08-15	

**Microbiological Parameters**



# TEST RESULTS

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

**Duteau Creek (HWY 6) (23H1811-02) | Matrix: Water | Sampled: 2023-08-13 11:05, Continued**

*Microbiological Parameters, Continued*

Coliforms, Total (Q-Tray)	1500	MAC = 0	1	MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	82	N/A	1	MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	82	MAC = 0	1	MPN/100 mL	2023-08-14	

**Mid Bessette Creek (23H1811-03) | Matrix: Water | Sampled: 2023-08-13 10:30**

*Anions*

Chloride	7.97	AO ≤ 250	0.10	mg/L	2023-08-15	
Nitrate (as N)	0.215	MAC = 10	0.010	mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-08-15	
Sulfate	24.4	AO ≤ 500	1.0	mg/L	2023-08-15	

*Calculated Parameters*

Nitrate+Nitrite (as N)	0.215	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.499	N/A	0.0500	mg/L	N/A	

*General Parameters*

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2023-08-15	
Conductivity (EC)	250	N/A	2.0	µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.284	N/A	0.050	mg/L	2023-08-16	
pH	8.09	7.0-10.5	0.10	pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0270	N/A	0.0050	mg/L	2023-08-16	
Phosphorus, Total Dissolved	0.0157	N/A	0.0050	mg/L	2023-08-16	
Turbidity	1.55	OG < 1	0.10	NTU	2023-08-15	

*Microbiological Parameters*

Coliforms, Total (Q-Tray)	2410	MAC = 0	1	MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	194	N/A	1	MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	107	MAC = 0	1	MPN/100 mL	2023-08-14	

**Lower Bessette Creek (23H1811-04) | Matrix: Water | Sampled: 2023-08-13 10:10**

*Anions*

Chloride	8.72	AO ≤ 250	0.10	mg/L	2023-08-15	
Nitrate (as N)	0.027	MAC = 10	0.010	mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-08-15	
Sulfate	27.9	AO ≤ 500	1.0	mg/L	2023-08-15	

*Calculated Parameters*

Nitrate+Nitrite (as N)	0.0269	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.321	N/A	0.0500	mg/L	N/A	

*General Parameters*

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2023-08-15	
-----------------------	---------	---------------	-------	------	------------	--



# TEST RESULTS

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
---------	--------	-----------	----------	----------	-----------

**Lower Bessette Creek (23H1811-04) | Matrix: Water | Sampled: 2023-08-13 10:10, Continued**

**General Parameters, Continued**

Conductivity (EC)	277	N/A	2.0 µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.294	N/A	0.050 mg/L	2023-08-16	
pH	8.22	7.0-10.5	0.10 pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0190	N/A	0.0050 mg/L	2023-08-16	
Phosphorus, Total Dissolved	0.0092	N/A	0.0050 mg/L	2023-08-16	
Turbidity	1.36	OG < 1	0.10 NTU	2023-08-15	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	1730	MAC = 0	1 MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	74	N/A	1 MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	74	MAC = 0	1 MPN/100 mL	2023-08-14	

**Shuswap River (Wilsey Dam) (23H1811-05) | Matrix: Water | Sampled: 2023-08-13**

**Anions**

Chloride	0.79	AO ≤ 250	0.10 mg/L	2023-08-15	
Nitrate (as N)	0.018	MAC = 10	0.010 mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2023-08-15	
Sulfate	10.5	AO ≤ 500	1.0 mg/L	2023-08-15	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.0176	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)	< 0.050	None Required	0.050 mg/L	2023-08-15	
Conductivity (EC)	145	N/A	2.0 µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050 mg/L	2023-08-16	
pH	8.02	7.0-10.5	0.10 pH units	2023-08-17	HT2
Phosphorus, Total (as P)	< 0.0050	N/A	0.0050 mg/L	2023-08-16	
Phosphorus, Total Dissolved	< 0.0050	N/A	0.0050 mg/L	2023-08-16	
Turbidity	0.26	OG < 1	0.10 NTU	2023-08-15	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	1990	MAC = 0	1 MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	13	N/A	1 MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	13	MAC = 0	1 MPN/100 mL	2023-08-14	

**Shuswap River (Odd Fellows) (23H1811-06) | Matrix: Water | Sampled: 2023-08-13 09:15**

**Anions**

Chloride	1.07	AO ≤ 250	0.10 mg/L	2023-08-15	
Nitrate (as N)	0.014	MAC = 10	0.010 mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2023-08-15	



# TEST RESULTS

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Shuswap River (Odd Fellows) (23H1811-06)   Matrix: Water   Sampled: 2023-08-13 09:15, Continued</b>					
<i>Anions, Continued</i>					
Sulfate	11.3	AO ≤ 500	1.0 mg/L	2023-08-15	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.0145	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.0935	N/A	0.0500 mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2023-08-15	
Conductivity (EC)	154	N/A	2.0 µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.079	N/A	0.050 mg/L	2023-08-16	
pH	7.98	7.0-10.5	0.10 pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0055	N/A	0.0050 mg/L	2023-08-16	
Phosphorus, Total Dissolved	< 0.0050	N/A	0.0050 mg/L	2023-08-16	
Turbidity	0.50	OG < 1	0.10 NTU	2023-08-15	
<i>Microbiological Parameters</i>					
Coliforms, Total (Q-Tray)	548	MAC = 0	1 MPN/100 mL	2023-08-14	HT1
Coliforms, Fecal (Q-Tray)	20	N/A	1 MPN/100 mL	2023-08-14	HT1
E. coli (Q-Tray)	18	MAC = 0	1 MPN/100 mL	2023-08-14	HT1

**Vance Creek (Mabel Lake Rd) (23H1811-07) | Matrix: Water | Sampled: 2023-08-13 10:45**

<i>Anions</i>					
Chloride	4.09	AO ≤ 250	0.10 mg/L	2023-08-15	
Nitrate (as N)	0.096	MAC = 10	0.010 mg/L	2023-08-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2023-08-15	
Sulfate	42.3	AO ≤ 500	1.0 mg/L	2023-08-15	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.0961	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.216	N/A	0.0500 mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2023-08-15	
Conductivity (EC)	390	N/A	2.0 µS/cm	2023-08-17	
Nitrogen, Total Kjeldahl	0.120	N/A	0.050 mg/L	2023-08-16	
pH	8.29	7.0-10.5	0.10 pH units	2023-08-17	HT2
Phosphorus, Total (as P)	0.0078	N/A	0.0050 mg/L	2023-08-16	
Phosphorus, Total Dissolved	< 0.0050	N/A	0.0050 mg/L	2023-08-16	
Turbidity	0.59	OG < 1	0.10 NTU	2023-08-15	
<i>Microbiological Parameters</i>					
Coliforms, Total (Q-Tray)	1410	MAC = 0	1 MPN/100 mL	2023-08-14	
Coliforms, Fecal (Q-Tray)	64	N/A	1 MPN/100 mL	2023-08-14	
E. coli (Q-Tray)	56	MAC = 0	1 MPN/100 mL	2023-08-14	



## TEST RESULTS

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

**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** 23H1811  
2023-08-21 11:35

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Coliforms, Fecal in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2021)	Conductivity Meter	✓	Kelowna
E. coli in Water	SM 9223 (2016)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Turbidity in Water	SM 2130 B (2020)	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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
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 \(Health Canada, September 2022\)](#)

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



## APPENDIX 1: SUPPORTING INFORMATION

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

**WORK ORDER REPORTED** 23H1811  
2023-08-21 11:35

**General Comments:**

The results in this report apply to the received 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. CarO will dispose of all samples within 30 days of sample receipt, unless otherwise agreed. The quality control (QC) data is available upon request

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)

*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.*