

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

TEL (250) 547-2554
FAX -

ATTENTION Russ Collins

WORK ORDER 5110971

PO NUMBER

RECEIVED / TEMP Nov-16-15 09:10 / 1°C

PROJECT Analytical Testing

REPORTED Nov-23-15

PROJECT INFO

COC NUMBER 40837.5581

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition 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.



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Analysis Description	Method Reference	Technique	Location
Ammonia-N in Water (total)	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
E. coli (Partition)	APHA 9222 G	Membrane Filtration / Nutrient Agar with MUG	Kelowna
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Kjeldahl Nitrogen in Water	APHA 4500-Norg D*	Block Digestion and Flow Injection Analysis	Kelowna
Total Phosphorus in Water	APHA 4500-P B.5 / APHA 4500-P F	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Total Phosphorus, dissolved	APHA 4500-P B.5 / APHA 4500-P F	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

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

Method Reference Descriptions:

APHA Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

Glossary of Terms:

MRL Method Reporting Limit
 < Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
 AO Aesthetic objective
 MAC Maximum acceptable concentration (health based)
 OG Operational guideline (treated water)
 CFU/100 mL Colony Forming Units per 100 millilitres
 mg/L Milligrams per litre
 NTU Nephelometric Turbidity Units
 pH units pH < 7 = acidic, pH > 7 = basic
 µS/cm Microsiemens per centimetre

Standards / Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Oct 2014)

Website: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

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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Analyte	Result / Recovery	Standard / Guideline	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Harris Creek (Hwy 6) (5110971-01) [Water] Sampled: Nov-15-15 10:40

FILT,
PRES

Anions

Chloride	3.36	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.043	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	32.4	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	291	N/A	2	µS/cm	N/A	Nov-16-15	
Ammonia as N, Total	< 0.020	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.28	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	8.02	6.5-8.5	0.01	pH units	N/A	Nov-16-15	HT2
Phosphorus, Total as P	0.022	N/A	0.002	mg/L	Nov-16-15	Nov-18-15	
Phosphorus, Total Dissolved	0.021	N/A	0.002	mg/L	Nov-16-15	Nov-18-15	
Turbidity	0.7	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.043	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.321	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	25	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Sample ID: Duteau Creek (Hwy 6) (5110971-02) [Water] Sampled: Nov-15-15 10:50

FILT,
PRES

Anions

Chloride	8.26	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.289	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	18.8	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	228	N/A	2	µS/cm	N/A	Nov-16-15	
Ammonia as N, Total	< 0.020	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.35	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	7.91	6.5-8.5	0.01	pH units	N/A	Nov-16-15	HT2
Phosphorus, Total as P	0.025	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.017	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Turbidity	3.9	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.289	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.635	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	21	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Analyte	Result / Recovery	Standard / Guideline	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Mid Bessette Creek (5110971-03) [Water] Sampled: Nov-15-15 10:05

FILT,
PRES

Anions

Chloride	8.77	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.216	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	34.1	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	326	N/A	2	µS/cm	N/A	Nov-16-15	
Ammonia as N, Total	0.033	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.35	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	8.05	6.5-8.5	0.01	pH units	N/A	Nov-16-15	HT2
Phosphorus, Total as P	0.045	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.035	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Turbidity	2.3	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.216	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.563	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	51	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Sample ID: Lower Bessette Creek (5110971-04) [Water] Sampled: Nov-15-15 10:00

FILT,
PRES

Anions

Chloride	8.47	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.221	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	35.3	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	322	N/A	2	µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	0.024	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.27	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	8.03	6.5-8.5	0.01	pH units	N/A	Nov-17-15	HT2
Phosphorus, Total as P	0.036	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.025	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Turbidity	3.0	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.221	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.494	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	43	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Analyte	Result / Recovery	Standard / Guideline	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Shuswap River (Wilsey Dam) (5110971-05) [Water] Sampled: Nov-15-15 09:45

FILT,
PRES

Anions

Chloride	0.36	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.048	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	6.0	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	97	N/A	2	µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	< 0.020	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.11	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	7.83	6.5-8.5	0.01	pH units	N/A	Nov-17-15	HT2
Phosphorus, Total as P	0.009	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.007	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Turbidity	0.4	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.048	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.158	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	4	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Sample ID: Shuswap River (Odd Fellows) (5110971-06) [Water] Sampled: Nov-15-15 09:10

FILT,
PRES

Anions

Chloride	0.84	AO ≤ 250	0.10	mg/L	N/A	Nov-18-15	
Nitrate as N	0.048	MAC = 10	0.010	mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Nov-18-15	
Sulfate	8.2	AO ≤ 500	1.0	mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	119	N/A	2	µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	< 0.020	N/A	0.020	mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.13	N/A	0.05	mg/L	Nov-18-15	Nov-19-15	
pH	7.81	6.5-8.5	0.01	pH units	N/A	Nov-17-15	HT2
Phosphorus, Total as P	0.010	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.010	N/A	0.002	mg/L	Nov-17-15	Nov-20-15	
Turbidity	0.7	OG < 0.1	0.1	NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.048	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.181	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

E. coli	3	MAC = None Detected	1	CFU/100 mL	Nov-16-15	Nov-17-15	
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Analyte	Result / Recovery	Standard / Guideline	MRL / Units	Prepared	Analyzed	Notes
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Sample ID: Vance Creek (Mabel Lake Road) (5110971-07) [Water] Sampled: Nov-15-15 10:25

FILT,
PRES

Anions

Chloride	3.26	AO ≤ 250	0.10 mg/L	N/A	Nov-18-15	
Nitrate as N	0.070	MAC = 10	0.010 mg/L	N/A	Nov-18-15	
Nitrite as N	< 0.010	MAC = 1	0.010 mg/L	N/A	Nov-18-15	
Sulfate	38.3	AO ≤ 500	1.0 mg/L	N/A	Nov-18-15	

General Parameters

Conductivity (EC)	389	N/A	2 µS/cm	N/A	Nov-17-15	
Ammonia as N, Total	< 0.020	N/A	0.020 mg/L	N/A	Nov-19-15	
Nitrogen, Total Kjeldahl	0.14	N/A	0.05 mg/L	Nov-18-15	Nov-19-15	
pH	8.25	6.5-8.5	0.01 pH units	N/A	Nov-17-15	HT2
Phosphorus, Total as P	0.009	N/A	0.002 mg/L	Nov-17-15	Nov-20-15	
Phosphorus, Total Dissolved	0.009	N/A	0.002 mg/L	Nov-17-15	Nov-20-15	
Turbidity	0.3	OG < 0.1	0.1 NTU	N/A	Nov-17-15	

Calculated Parameters

Nitrate+Nitrite as N	0.070	N/A	0.010 mg/L	N/A	N/A	
Nitrogen, Total	0.208	N/A	0.050 mg/L	N/A	N/A	

Microbiological Parameters

E. coli	8	MAC = None Detected	1 CFU/100 mL	Nov-16-15	Nov-17-15	
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Sample / Analysis Qualifiers:

FILT	Sample has been filtered for Dissolved Nutrients in the laboratory.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
PRES	Sample has been preserved for Total and Dissolved Nutrients in the laboratory and the holding time has been extended.