CERTIFICATE OF ANALYSIS

REPORTED TO	Campbell Scientific Canada Corp. 1030 Sugar Lake Rd Cherryville, BC V0E 2G2		
ATTENTION	Claude Labine	**WORK ORDER**	22K1524
PO NUMBER		**RECEIVED / TEMP**	2022-11-14 08:54 / - 0.1°C
PROJECT	Cherryville Water Stewart	**REPORTED**	2022-11-21 15:33
PROJECT INFO		**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/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

Authorized By:

Team CARO
Client Service Representative

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO Campbell Scientific Canada Corp.
PROJECT Cherryville Water Stewart

WORK ORDER 22K1524
REPORTED 2022-11-21 15:33

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Shuswap River @ Sihlis Rd (22K1524-01) | Matrix: Water | Sampled: 2022-11-13 14:34						F2, PRES
Anions						
Chloride	< 0.10	AO ≤ 250	0.10	mg/L	2022-11-14	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2022-11-14	
Nitrate (as N)	**0.035**	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	**3.9**	AO ≤ 500	1.0	mg/L	2022-11-14	
Calculated Parameters						
Hardness, Total (as CaCO3)	**35.5**	None Required	0.500	mg/L	N/A	
Solids, Total Dissolved	**46.3**	AO ≤ 500	1.00	mg/L	N/A	
General Parameters						
Alkalinity, Total (as CaCO3)	**44.7**	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Bicarbonate (as CaCO3)	**44.7**	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Conductivity (EC)	**74.7**	N/A	2.0	µS/cm	2022-11-16	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2022-11-17	
pH	**6.82**	7.0-10.5	0.10	pH units	2022-11-16	HT2
Turbidity	**0.30**	OG < 1	0.10	NTU	2022-11-14	
Microbiological Parameters						
Coliforms, Total (Q-Tray)	**236**	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	< 1	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	< 1	MAC = 0	1	MPN/100 mL	2022-11-14	
Total Metals						
Aluminum, total	**0.0150**	OG < 0.1	0.0050	mg/L	2022-11-18	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2022-11-18	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2022-11-18	
Barium, total	**0.0072**	MAC = 2	0.0050	mg/L	2022-11-18	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2022-11-18	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2022-11-18	
Calcium, total	**12.4**	None Required	0.20	mg/L	2022-11-18	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2022-11-18	
Copper, total	< 0.00040	MAC = 2	0.00040	mg/L	2022-11-18	
Iron, total	**0.021**	AO ≤ 0.3	0.010	mg/L	2022-11-18	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2022-11-18	
Magnesium, total	**1.08**	None Required	0.010	mg/L	2022-11-18	
Manganese, total	**0.00145**	MAC = 0.12	0.00020	mg/L	2022-11-18	
Potassium, total	**0.75**	N/A	0.10	mg/L	2022-11-18	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2022-11-18	
Sodium, total	**0.77**	AO ≤ 200	0.10	mg/L	2022-11-18	
Strontium, total	**0.0408**	MAC = 7	0.0010	mg/L	2022-11-18	

CARO ANALYTICAL SERVICES

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Shuswap River @ Sihlis Rd (22K1524-01) | Matrix: Water | Sampled: 2022-11-13 14:34, Continued						F2, PRES
Total Metals, Continued						
Uranium, total	**0.000323**	MAC = 0.02	0.000020	mg/L	2022-11-18	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2022-11-18	
Reiter Creek @ Shuswap River (22K1524-02) | Matrix: Water | Sampled: 2022-11-13 14:33						F2, PRES
Anions						
Chloride	**0.20**	AO ≤ 250	0.10	mg/L	2022-11-14	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2022-11-14	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	**9.5**	AO ≤ 500	1.0	mg/L	2022-11-14	
Calculated Parameters						
Hardness, Total (as CaCO3)	**124**	None Required	0.500	mg/L	N/A	
Solids, Total Dissolved	**136**	AO ≤ 500	1.00	mg/L	N/A	
General Parameters						
Alkalinity, Total (as CaCO3)	**125**	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Bicarbonate (as CaCO3)	**125**	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2022-11-16	
Conductivity (EC)	**236**	N/A	2.0	µS/cm	2022-11-16	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2022-11-17	
pH	**7.77**	7.0-10.5	0.10	pH units	2022-11-16	HT2
Turbidity	**0.73**	OG < 1	0.10	NTU	2022-11-14	
Microbiological Parameters						
Coliforms, Total (Q-Tray)	**112**	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	**3**	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	**3**	MAC = 0	1	MPN/100 mL	2022-11-14	
Total Metals						
Aluminum, total	**0.0456**	OG < 0.1	0.0050	mg/L	2022-11-18	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2022-11-18	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2022-11-18	
Barium, total	**0.0251**	MAC = 2	0.0050	mg/L	2022-11-18	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2022-11-18	
Cadmium, total	**0.000016**	MAC = 0.005	0.000010	mg/L	2022-11-18	
Calcium, total	**42.9**	None Required	0.20	mg/L	2022-11-18	
Chromium, total	**0.00066**	MAC = 0.05	0.00050	mg/L	2022-11-18	
Copper, total	< 0.00040	MAC = 2	0.00040	mg/L	2022-11-18	
Iron, total	**0.059**	AO ≤ 0.3	0.010	mg/L	2022-11-18	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2022-11-18	

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Reiter Creek @ Shuswap River (22K1524-02) | Matrix: Water | Sampled: 2022-11-13 14:33, Continued						F2, PRES
Total Metals, Continued						
Magnesium, total	**4.13**	None Required	0.010	mg/L	2022-11-18	
Manganese, total	**0.00485**	MAC = 0.12	0.00020	mg/L	2022-11-18	
Potassium, total	**1.35**	N/A	0.10	mg/L	2022-11-18	
Selenium, total	**0.00070**	MAC = 0.05	0.00050	mg/L	2022-11-18	
Sodium, total	**1.20**	AO ≤ 200	0.10	mg/L	2022-11-18	
Strontium, total	**0.113**	MAC = 7	0.0010	mg/L	2022-11-18	
Uranium, total	**0.000752**	MAC = 0.02	0.000020	mg/L	2022-11-18	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2022-11-18	
Cherry Creek @ Shuswap River (22K1524-03) | Matrix: Water | Sampled: 2022-11-13 14:58						
Microbiological Parameters						
Coliforms, Total (Q-Tray)	**43**	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	**2**	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	**1**	MAC = 0	1	MPN/100 mL	2022-11-14	
Ferry Creek @ Shuswap River (22K1524-04) | Matrix: Water | Sampled: 2022-11-13 15:04						
Microbiological Parameters						
Coliforms, Total (Q-Tray)	**162**	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	**1**	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	**1**	MAC = 0	1	MPN/100 mL	2022-11-14	

Sample Qualifiers:

F2	The sample was not field-preserved with HNO3 and was therefore preserved in the laboratory and held for at least 16 hours prior to analysis for total metals.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
PRES	Sample has been preserved for Cyanide in the laboratory and the holding time has been extended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Campbell Scientific Canada Corp.	**WORK ORDER**	22K1524
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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)		N/A
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

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
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

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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

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