



CERTIFICATE OF ANALYSIS

REPORTED TO Not Provided
Kelowna, BC n/a

SITE INFO
CARO WO# 22L2354

RECEIVED / TEMP 2022-12-21 13:01 / 19.1°C
REPORTED 2023-01-04

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.

Report Highlights:

The results in this report apply to the samples analyzed in accordance with your submission.

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

Laboratory Recommendations:

For assistance reading your report, please visit

<https://www.caro.ca/wp-content/uploads/2020/07/How-to-read-your-report-1.pdf>

For information about bacteria in water results, please visit

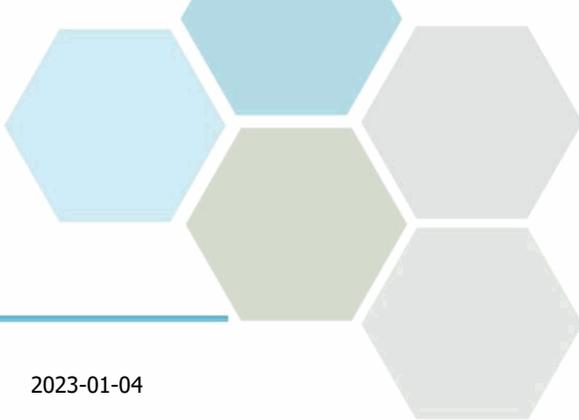
<https://www.caro.ca/you-need-to-know-about-bacteria-in-water-analytical-report/>

If you have any additional questions or concerns, please contact us at TeamCaro@caro.ca.

Authorized By:

Team CARO

Client Service Representative



TEST RESULTS

REPORTED TO

CARO WO# 22L2354

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Parameter	Result	Guideline	RL	Units	Analyzed	Note
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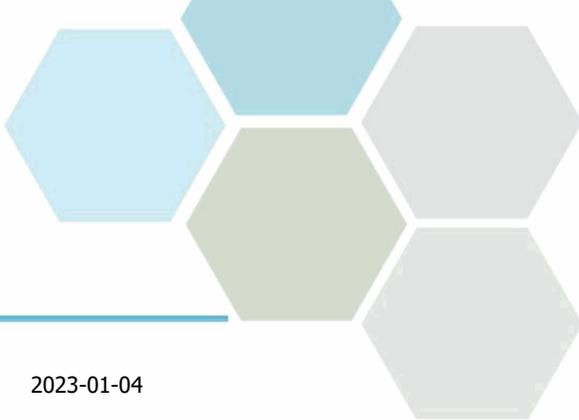
Sample Name: Sample | Matrix: Water | Sampled: 2022-12-20

Calculated Parameters

Hardness, Total (as CaCO3)	1.01	None Required	0.500	mg/L	N/A	
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Total Metals

Aluminum, total	0.0291	OG < 0.1	0.0050	mg/L	2022-12-31	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2022-12-31	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2022-12-31	
Barium, total	0.0089	MAC = 2	0.0050	mg/L	2022-12-31	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2022-12-31	
Cadmium, total	0.000014	MAC = 0.005	0.000010	mg/L	2022-12-31	
Calcium, total	0.29	None Required	0.20	mg/L	2022-12-31	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2022-12-31	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Copper, total	0.00381	MAC = 2	0.00040	mg/L	2022-12-31	
Iron, total	0.031	AO ≤ 0.3	0.010	mg/L	2022-12-31	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2022-12-31	
Lithium, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Magnesium, total	0.065	None Required	0.010	mg/L	2022-12-31	
Manganese, total	0.00947	MAC = 0.12	0.00020	mg/L	2022-12-31	
Molybdenum, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2022-12-31	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2022-12-31	
Potassium, total	0.19	N/A	0.10	mg/L	2022-12-31	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2022-12-31	
Silicon, total	< 1.0	N/A	1.0	mg/L	2022-12-31	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2022-12-31	
Sodium, total	0.30	AO ≤ 200	0.10	mg/L	2022-12-31	
Strontium, total	0.0021	MAC = 7	0.0010	mg/L	2022-12-31	
Sulfur, total	< 3.0	N/A	3.0	mg/L	2022-12-31	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2022-12-31	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2022-12-31	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2022-12-31	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2022-12-31	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2022-12-31	
Uranium, total	< 0.000020	MAC = 0.02	0.000020	mg/L	2022-12-31	
Vanadium, total	< 0.0050	N/A	0.0050	mg/L	2022-12-31	
Zinc, total	0.0056	AO ≤ 5	0.0040	mg/L	2022-12-31	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2022-12-31	



APPENDIX 1: SUPPORTING INFORMATION

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Analysis Description	Method Ref.	Technique	Accredited	Location
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

Glossary:

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
OG	Operational Guideline (treated water)
EPA	United States Environmental Protection Agency Test Methods
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 \(Health Canada, June 2019\)](#)

General Comments:

For assistance reading your report, please visit

<https://www.caro.ca/wp-content/uploads/2020/07/How-to-read-your-report-1.pdf>

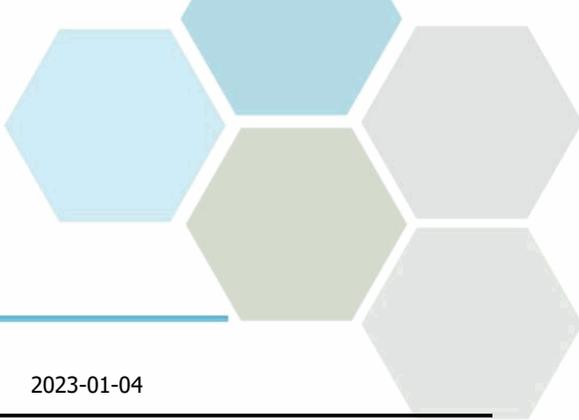
For information about bacteria in water results, please visit

<https://www.caro.ca/you-need-to-know-about-bacteria-in-water-analytical-report/>

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. Samples will be disposed of 30 days after the test report has been issued or once samples expire, whichever comes first. Longer hold is possible if agreed to in writing.

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

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.



APPENDIX 2: QUALITY CONTROL RESULTS

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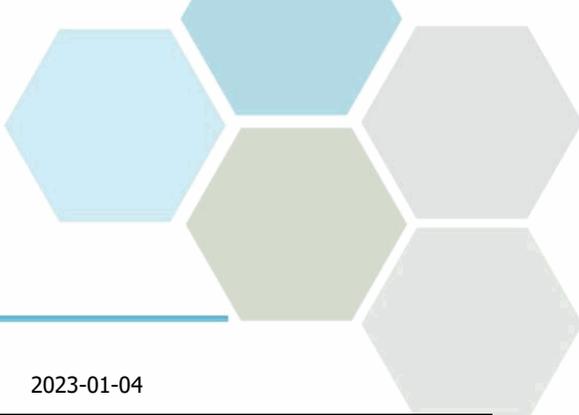
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B2L2877									
Blank (B2L2877-BLK1)			Prepared: 2022-12-30, Analyzed: 2022-12-31						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							
Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0050	0.0050 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B2L2877, Continued									
Blank (B2L2877-BLK1), Continued					Prepared: 2022-12-30, Analyzed: 2022-12-31				
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							
LCS (B2L2877-BS1)					Prepared: 2022-12-30, Analyzed: 2022-12-31				
Aluminum, total	3.69	0.0050 mg/L	4.00		92	80-120			
Antimony, total	0.0387	0.00020 mg/L	0.0400		97	80-120			
Arsenic, total	0.376	0.00050 mg/L	0.400		94	80-120			
Barium, total	0.0391	0.0050 mg/L	0.0400		98	80-120			
Beryllium, total	0.0373	0.00010 mg/L	0.0400		93	80-120			
Bismuth, total	0.0360	0.00010 mg/L	0.0400		90	80-120			
Boron, total	0.380	0.0500 mg/L	0.400		95	80-120			
Cadmium, total	0.0392	0.000010 mg/L	0.0400		98	80-120			
Calcium, total	3.73	0.20 mg/L	4.00		93	80-120			
Chromium, total	0.0373	0.00050 mg/L	0.0400		93	80-120			
Cobalt, total	0.0375	0.00010 mg/L	0.0400		94	80-120			
Copper, total	0.0377	0.00040 mg/L	0.0400		94	80-120			
Iron, total	3.77	0.010 mg/L	4.00		94	80-120			
Lead, total	0.0368	0.00020 mg/L	0.0400		92	80-120			
Lithium, total	0.0368	0.00010 mg/L	0.0400		92	80-120			
Magnesium, total	3.67	0.010 mg/L	4.00		92	80-120			
Manganese, total	0.0376	0.00020 mg/L	0.0400		94	80-120			
Molybdenum, total	0.0381	0.00010 mg/L	0.0400		95	80-120			
Nickel, total	0.0373	0.00040 mg/L	0.0400		93	80-120			
Phosphorus, total	3.68	0.050 mg/L	4.00		92	80-120			
Potassium, total	3.82	0.10 mg/L	4.00		96	80-120			
Selenium, total	0.366	0.00050 mg/L	0.400		92	80-120			
Silicon, total	3.9	1.0 mg/L	4.00		97	80-120			
Silver, total	0.0394	0.000050 mg/L	0.0400		98	80-120			
Sodium, total	3.79	0.10 mg/L	4.00		95	80-120			
Strontium, total	0.0381	0.0010 mg/L	0.0400		95	80-120			
Sulfur, total	37.1	3.0 mg/L	40.0		93	80-120			
Tellurium, total	0.0392	0.00050 mg/L	0.0400		98	80-120			
Thallium, total	0.0352	0.000020 mg/L	0.0400		88	80-120			
Thorium, total	0.0373	0.00010 mg/L	0.0400		93	80-120			
Tin, total	0.0390	0.00020 mg/L	0.0400		97	80-120			
Titanium, total	0.0378	0.0050 mg/L	0.0400		95	80-120			
Tungsten, total	0.0374	0.0010 mg/L	0.0400		93	80-120			
Uranium, total	0.0356	0.000020 mg/L	0.0400		89	80-120			
Vanadium, total	0.0371	0.0050 mg/L	0.0400		93	80-120			
Zinc, total	0.376	0.0040 mg/L	0.400		94	80-120			
Zirconium, total	0.0400	0.00010 mg/L	0.0400		100	80-120			