



CERTIFICATE OF ANALYSIS

REPORTED TO	Alto Utilities Ltd. 10397 Lodge Rd LAKE COUNTRY, BC V4V 1V6	WORK ORDER	0109138
ATTENTION	Keith Hanson	RECEIVED / TEMP REPORTED	2020-09-30 08:54 / 15°C 2020-10-07 16:31
PO NUMBER		COC NUMBER	B90886
PROJECT	Water Bacteriology		
PROJECT INFO	No Project		

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.

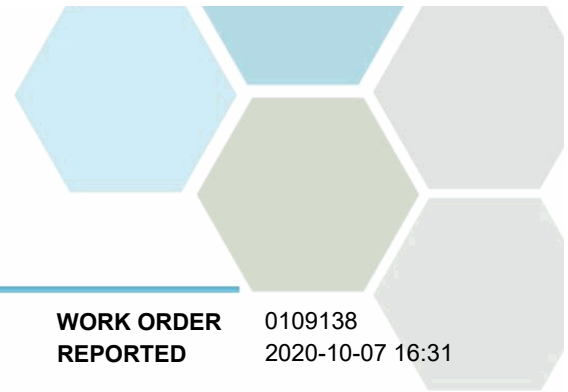
If you have any questions or concerns, please contact me at teamcaro@caro.ca

Authorized By:

Team CARO
Client Service Representative

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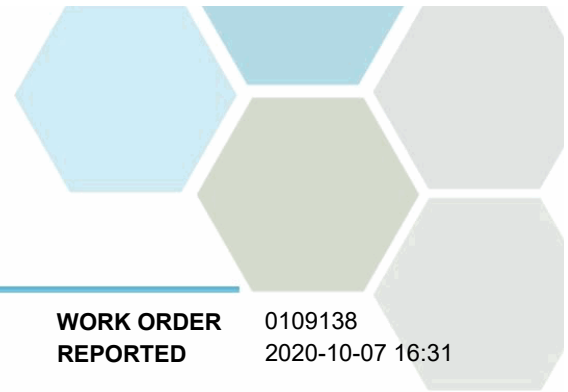


TEST RESULTS

REPORTED TO PROJECT Alto Utilities Ltd.
Water Bacteriology

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2020-10-07 16:31

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Lodge (Source) N. Well (60hp) (0109138-01) Matrix: Water Sampled: 2020-09-30 07:30					
Anions					
Chloride	76.4	AO ≤ 250	0.10 mg/L	2020-10-01	
Fluoride	0.38	MAC = 1.5	0.10 mg/L	2020-10-01	
Nitrate (as N)	0.722	MAC = 10	0.010 mg/L	2020-10-01	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-10-01	
Sulfate	70.2	AO ≤ 500	1.0 mg/L	2020-10-01	
Calculated Parameters					
Hardness, Total (as CaCO3)	350	None Required	0.500 mg/L	N/A	
Solids, Total Dissolved	502	AO ≤ 500	1.00 mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	286	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Bicarbonate (as CaCO3)	286	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Conductivity (EC)	872	N/A	2.0 µS/cm	2020-10-05	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-10-05	
pH	8.09	7.0-10.5	0.10 pH units	2020-10-05	HT2
Turbidity	1.09	OG < 1	0.10 NTU	2020-10-01	
Microbiological Parameters					
Coliforms, Total	< 1	MAC = 0	1 CFU/100 mL	2020-10-01	
E. coli	< 1	MAC = 0	1 CFU/100 mL	2020-10-01	
Total Metals					
Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-10-06	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-10-06	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2020-10-06	
Barium, total	0.0466	MAC = 2	0.0050 mg/L	2020-10-06	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2020-10-06	
Cadmium, total	0.000026	MAC = 0.005	0.000010 mg/L	2020-10-06	
Calcium, total	84.8	None Required	0.20 mg/L	2020-10-06	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-06	
Copper, total	0.00127	MAC = 2	0.00040 mg/L	2020-10-06	
Iron, total	0.160	AO ≤ 0.3	0.010 mg/L	2020-10-06	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2020-10-06	
Magnesium, total	33.5	None Required	0.010 mg/L	2020-10-06	
Manganese, total	0.0258	MAC = 0.12	0.00020 mg/L	2020-10-06	
Potassium, total	5.45	N/A	0.10 mg/L	2020-10-06	
Selenium, total	0.00217	MAC = 0.05	0.00050 mg/L	2020-10-06	
Sodium, total	54.4	AO ≤ 200	0.10 mg/L	2020-10-06	
Strontium, total	0.737	7	0.0010 mg/L	2020-10-06	
Uranium, total	0.0138	MAC = 0.02	0.000020 mg/L	2020-10-06	



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Lodge (Source) N. Well (60hp) (0109138-01) | Matrix: Water | Sampled: 2020-09-30 07:30, Continued

Total Metals, Continued

Zinc, total	0.0059	AO ≤ 5	0.0040 mg/L	2020-10-06	
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Vedla - Distribution (0109138-02) | Matrix: Water | Sampled: 2020-09-30 07:50

Anions

Chloride	75.2	AO ≤ 250	0.10 mg/L	2020-10-01	
Fluoride	0.39	MAC = 1.5	0.10 mg/L	2020-10-01	
Nitrate (as N)	0.711	MAC = 10	0.010 mg/L	2020-10-01	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-10-01	
Sulfate	70.0	AO ≤ 500	1.0 mg/L	2020-10-01	

Calculated Parameters

Hardness, Total (as CaCO3)	349	None Required	0.500 mg/L	N/A	
Solids, Total Dissolved	502	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

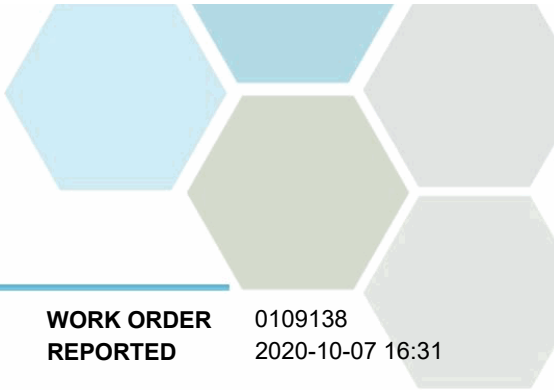
Alkalinity, Total (as CaCO3)	288	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Bicarbonate (as CaCO3)	288	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-05	
Conductivity (EC)	882	N/A	2.0 µS/cm	2020-10-05	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-10-05	
pH	7.97	7.0-10.5	0.10 pH units	2020-10-05	HT2
Turbidity	0.54	OG < 1	0.10 NTU	2020-10-01	

Microbiological Parameters

Coliforms, Total	< 1	MAC = 0	1 CFU/100 mL	2020-10-01	
E. coli	< 1	MAC = 0	1 CFU/100 mL	2020-10-01	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-10-06	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-10-06	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2020-10-06	
Barium, total	0.0464	MAC = 2	0.0050 mg/L	2020-10-06	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2020-10-06	
Cadmium, total	0.000026	MAC = 0.005	0.000010 mg/L	2020-10-06	
Calcium, total	85.4	None Required	0.20 mg/L	2020-10-06	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-06	
Copper, total	0.0265	MAC = 2	0.00040 mg/L	2020-10-06	
Iron, total	0.068	AO ≤ 0.3	0.010 mg/L	2020-10-06	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2020-10-06	
Magnesium, total	32.8	None Required	0.010 mg/L	2020-10-06	
Manganese, total	0.0142	MAC = 0.12	0.00020 mg/L	2020-10-06	



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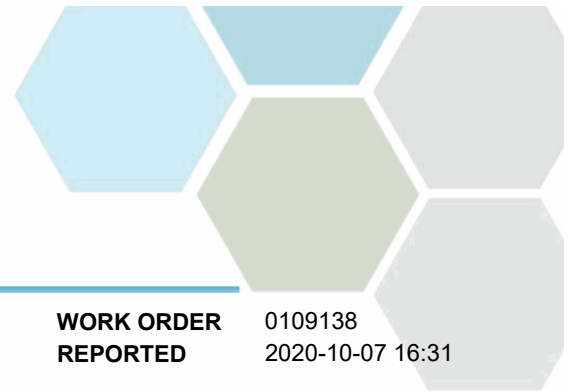
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Vedla - Distribution (0109138-02) Matrix: Water Sampled: 2020-09-30 07:50, Continued						
<i>Total Metals, Continued</i>						
Potassium, total	5.51	N/A	0.10	mg/L	2020-10-06	
Selenium, total	0.00205	MAC = 0.05	0.00050	mg/L	2020-10-06	
Sodium, total	54.0	AO ≤ 200	0.10	mg/L	2020-10-06	
Strontium, total	0.727	7	0.0010	mg/L	2020-10-06	
Uranium, total	0.0132	MAC = 0.02	0.000020	mg/L	2020-10-06	
Zinc, total	0.0054	AO ≤ 5	0.0040	mg/L	2020-10-06	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

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Water Bacteriology

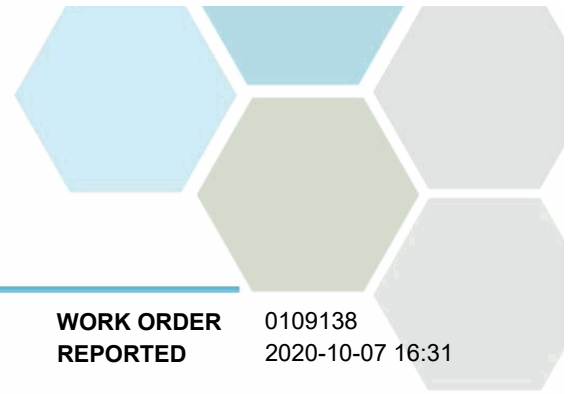
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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2017)	Membrane Filtration / Chromocult 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	SM 9222* (2017)	Membrane Filtration / Chromocult 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
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
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:

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

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.