



CERTIFICATE OF ANALYSIS

REPORTED TO	Alto Utilities Ltd. 10397 Lodge Rd LAKE COUNTRY, BC V4V 1V6	WORK ORDER	0040055
ATTENTION	Keith Hanson	RECEIVED / TEMP REPORTED	2020-03-31 13:05 / 14°C 2020-04-07 15:21
PO NUMBER		COC NUMBER	B87475
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 17025:2005 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.

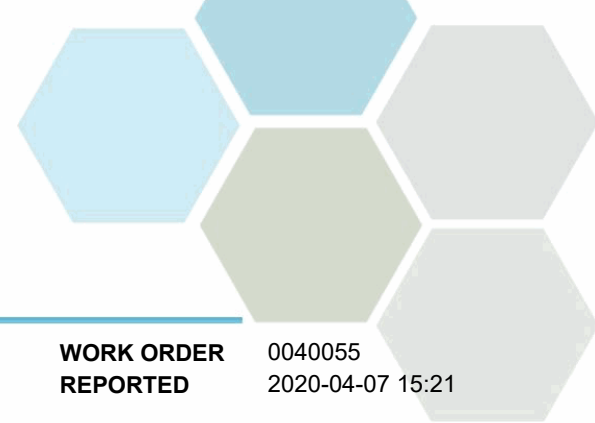
If you have any questions or concerns, please contact me at teamcaro@caro.ca

Authorized By:

Team CARO
Client Service Representative

1-888-311-8846 | 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

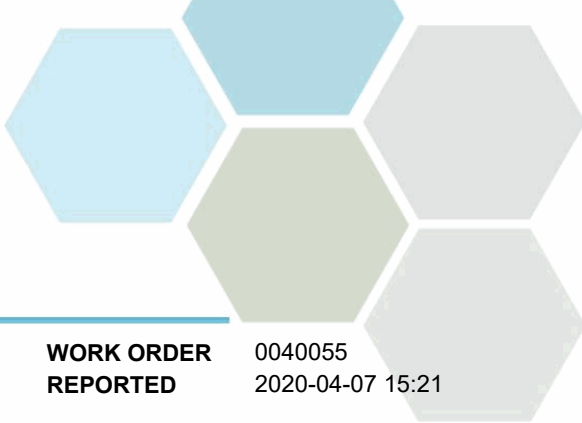


TEST RESULTS

REPORTED TO PROJECT Alto Utilities Ltd.
Water Bacteriology

WORK ORDER REPORTED 0040055
2020-04-07 15:21

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Lodge (Source) N. Well (30hp) (0040055-01) Matrix: Water Sampled: 2020-03-31 12:30					
Anions					
Chloride	75.1	AO ≤ 250	0.10 mg/L	2020-04-02	
Fluoride	0.18	MAC = 1.5	0.10 mg/L	2020-04-02	
Nitrate (as N)	0.330	MAC = 10	0.010 mg/L	2020-04-02	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-04-02	
Sulfate	69.5	AO ≤ 500	1.0 mg/L	2020-04-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	348	None Required	0.500 mg/L	N/A	
Solids, Total Dissolved	504	AO ≤ 500	1.00 mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	299	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Bicarbonate (as CaCO3)	299	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Conductivity (EC)	875	N/A	2.0 µS/cm	2020-04-03	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-04-02	
pH	8.06	7.0-10.5	0.10 pH units	2020-04-03	HT2
Turbidity	0.89	OG < 1	0.10 NTU	2020-04-01	
Microbiological Parameters					
Coliforms, Total	< 1	MAC = 0	1 CFU/100 mL	2020-04-01	
E. coli	< 1	MAC = 0	1 CFU/100 mL	2020-04-01	
Total Metals					
Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-04-03	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-04-03	
Arsenic, total	0.00092	MAC = 0.01	0.00050 mg/L	2020-04-03	
Barium, total	0.0645	MAC = 2	0.0050 mg/L	2020-04-03	
Boron, total	0.0549	MAC = 5	0.0050 mg/L	2020-04-03	
Cadmium, total	0.000023	MAC = 0.005	0.000010 mg/L	2020-04-03	
Calcium, total	87.1	None Required	0.20 mg/L	2020-04-03	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-04-03	
Copper, total	0.00102	MAC = 2	0.00040 mg/L	2020-04-03	
Iron, total	0.218	AO ≤ 0.3	0.010 mg/L	2020-04-03	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2020-04-03	
Magnesium, total	31.6	None Required	0.010 mg/L	2020-04-03	
Manganese, total	0.129	MAC = 0.12	0.00020 mg/L	2020-04-03	
Potassium, total	5.46	N/A	0.10 mg/L	2020-04-03	
Selenium, total	0.00168	MAC = 0.05	0.00050 mg/L	2020-04-03	
Sodium, total	51.6	AO ≤ 200	0.10 mg/L	2020-04-03	
Uranium, total	0.0126	MAC = 0.02	0.000020 mg/L	2020-04-03	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2020-04-03	



TEST RESULTS

REPORTED TO PROJECT Alto Utilities Ltd.
Water Bacteriology

WORK ORDER REPORTED 0040055
2020-04-07 15:21

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

Vedla - Distribution (0040055-02) | Matrix: Water | Sampled: 2020-03-31 12:00

Anions

Chloride	79.3	AO ≤ 250	0.10 mg/L	2020-04-02	
Fluoride	0.20	MAC = 1.5	0.10 mg/L	2020-04-02	
Nitrate (as N)	0.354	MAC = 10	0.010 mg/L	2020-04-02	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-04-02	
Sulfate	72.2	AO ≤ 500	1.0 mg/L	2020-04-02	

Calculated Parameters

Hardness, Total (as CaCO3)	357	None Required	0.500 mg/L	N/A	
Solids, Total Dissolved	516	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

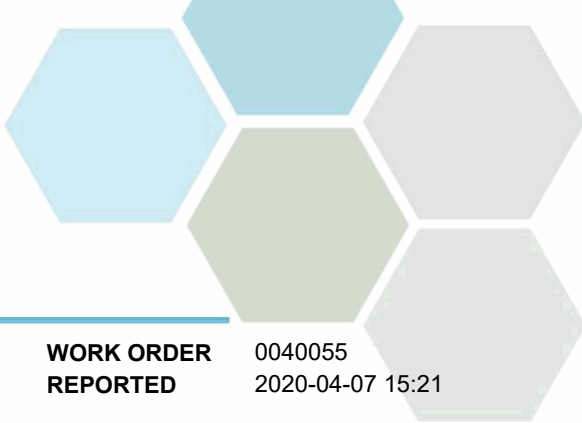
Alkalinity, Total (as CaCO3)	294	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Bicarbonate (as CaCO3)	294	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-04-03	
Conductivity (EC)	892	N/A	2.0 µS/cm	2020-04-03	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-04-02	
pH	7.96	7.0-10.5	0.10 pH units	2020-04-03	HT2
Turbidity	0.63	OG < 1	0.10 NTU	2020-04-01	

Microbiological Parameters

Coliforms, Total	< 1	MAC = 0	1 CFU/100 mL	2020-04-01	
E. coli	< 1	MAC = 0	1 CFU/100 mL	2020-04-01	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-04-03	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-04-03	
Arsenic, total	0.00061	MAC = 0.01	0.00050 mg/L	2020-04-03	
Barium, total	0.0617	MAC = 2	0.0050 mg/L	2020-04-03	
Boron, total	0.0583	MAC = 5	0.0050 mg/L	2020-04-03	
Cadmium, total	0.000017	MAC = 0.005	0.000010 mg/L	2020-04-03	
Calcium, total	87.3	None Required	0.20 mg/L	2020-04-03	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-04-03	
Copper, total	0.0432	MAC = 2	0.00040 mg/L	2020-04-03	
Iron, total	0.059	AO ≤ 0.3	0.010 mg/L	2020-04-03	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2020-04-03	
Magnesium, total	33.7	None Required	0.010 mg/L	2020-04-03	
Manganese, total	0.0631	MAC = 0.12	0.00020 mg/L	2020-04-03	
Potassium, total	5.73	N/A	0.10 mg/L	2020-04-03	
Selenium, total	0.00233	MAC = 0.05	0.00050 mg/L	2020-04-03	
Sodium, total	57.3	AO ≤ 200	0.10 mg/L	2020-04-03	
Uranium, total	0.0117	MAC = 0.02	0.000020 mg/L	2020-04-03	



TEST RESULTS

REPORTED TO PROJECT Alto Utilities Ltd.
Water Bacteriology

WORK ORDER REPORTED 0040055
2020-04-07 15:21

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

Vedla - Distribution (0040055-02) | Matrix: Water | Sampled: 2020-03-31 12:00, Continued

Total Metals, Continued

Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2020-04-03	
-------------	----------	--------	--------	------	------------	--

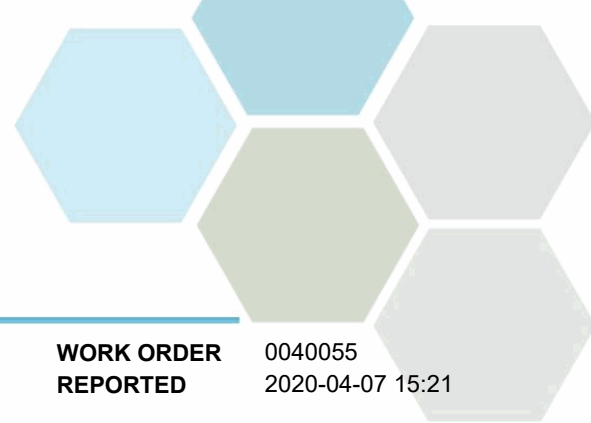
Peter Greer (0040055-03) | Matrix: Water | Sampled: 2020-03-31 11:40

Microbiological Parameters

Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2020-04-01	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2020-04-01	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO Alto Utilities Ltd.
PROJECT Water Bacteriology

WORK ORDER 0040055
REPORTED 2020-04-07 15:21

Analysis Description	Method Ref.	Technique	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

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