

## CERTIFICATE OF ANALYSIS

**REPORTED TO** Keremeos Irrigation District  
712 6th Ave, Box 220  
Keremeos, BC V0X 1N0

**ATTENTION** Jo Cottrill

**PO NUMBER**

**PROJECT** General Potability

**PROJECT INFO**

**WORK ORDER** 23L1419

**RECEIVED / TEMP** 2023-12-12 15:30 / 13.1°C  
**REPORTED** 2023-12-19 16:39

**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*



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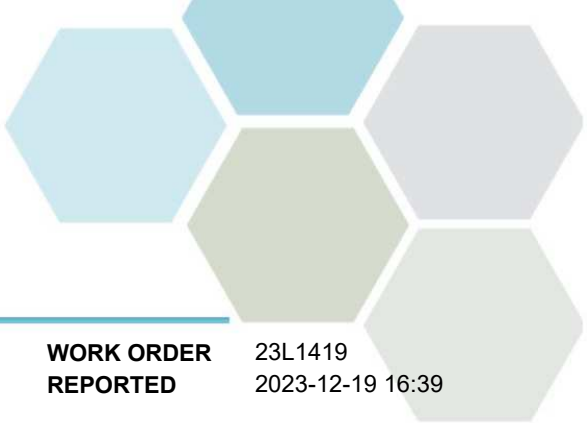
If you have any questions or concerns, please contact me at [TeamCaro@caro.ca](mailto:TeamCaro@caro.ca)

### Authorized By:

Team CARO  
Client Service Representative

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# TEST RESULTS

**REPORTED TO PROJECT** Keremeos Irrigation District  
General Potability

**WORK ORDER REPORTED** 23L1419  
2023-12-19 16:39

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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**#2 East Station (23L1419-01) | Matrix: Water | Sampled: 2023-12-11 09:40**

**Anions**

Chloride	8.88	AO ≤ 250	0.10	mg/L	2023-12-13	
Fluoride	0.13	MAC = 1.5	0.10	mg/L	2023-12-13	
Nitrate (as N)	1.74	MAC = 10	0.010	mg/L	2023-12-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-12-13	
Sulfate	89.6	AO ≤ 500	1.0	mg/L	2023-12-13	

**Calculated Parameters**

Hardness, Total (as CaCO3)	295	None Required	0.500	mg/L	N/A	
Langelier Index	0.6	N/A	-5.0		2023-12-19	CT6
Solids, Total Dissolved	352	AO ≤ 500	10.0	mg/L	N/A	

**General Parameters**

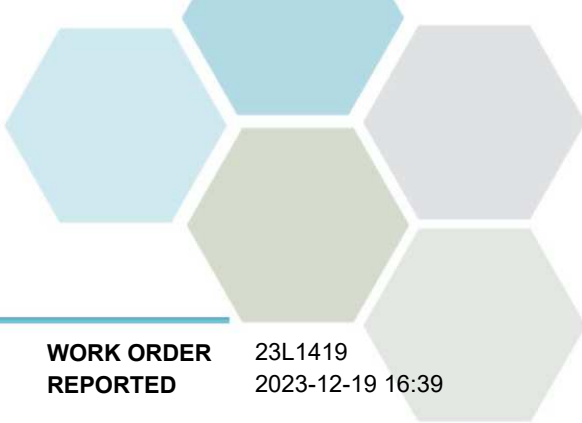
Alkalinity, Total (as CaCO3)	199	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Bicarbonate (as CaCO3)	199	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2023-12-13	
Conductivity (EC)	587	N/A	2.0	µS/cm	2023-12-19	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2023-12-16	
pH	7.91	7.0-10.5	0.10	pH units	2023-12-18	HT2
Temperature, at pH	22.9	N/A		°C	2023-12-18	HT2
Turbidity	0.13	OG < 1	0.10	NTU	2023-12-13	

**Microbiological Parameters**

Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	HT3
E. coli	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	HT3

**Total Metals**

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2023-12-15	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2023-12-15	
Arsenic, total	0.00297	MAC = 0.01	0.00050	mg/L	2023-12-15	
Barium, total	0.0317	MAC = 2	0.0050	mg/L	2023-12-15	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2023-12-15	
Cadmium, total	0.000010	MAC = 0.007	0.000010	mg/L	2023-12-15	
Calcium, total	88.7	None Required	0.20	mg/L	2023-12-15	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2023-12-15	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2023-12-15	
Copper, total	0.00585	MAC = 2	0.00040	mg/L	2023-12-15	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2023-12-15	
Lead, total	0.00063	MAC = 0.005	0.00020	mg/L	2023-12-15	
Magnesium, total	17.8	None Required	0.010	mg/L	2023-12-15	
Manganese, total	0.00035	MAC = 0.12	0.00020	mg/L	2023-12-15	
Mercury, total	< 0.000040	MAC = 0.001	0.000040	mg/L	2023-12-15	HG1



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2023-12-19 16:39

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>#2 East Station (23L1419-01)   Matrix: Water   Sampled: 2023-12-11 09:40, Continued</b>						
<i>Total Metals, Continued</i>						
Molybdenum, total	0.00334	N/A	0.00010	mg/L	2023-12-15	
Nickel, total	0.00070	N/A	0.00040	mg/L	2023-12-15	
Potassium, total	3.13	N/A	0.10	mg/L	2023-12-15	
Selenium, total	0.00168	MAC = 0.05	0.00050	mg/L	2023-12-15	
Sodium, total	14.6	AO ≤ 200	0.10	mg/L	2023-12-15	
Strontium, total	0.581	MAC = 7	0.0010	mg/L	2023-12-15	
Uranium, total	0.00249	MAC = 0.02	0.000020	mg/L	2023-12-15	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2023-12-15	

**#4 West Station (23L1419-02) | Matrix: Water | Sampled: 2023-12-11 10:50**

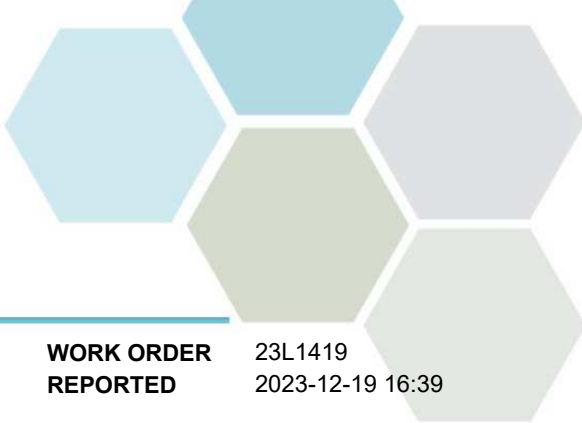
<i>Anions</i>						
Chloride	4.04	AO ≤ 250	0.10	mg/L	2023-12-13	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2023-12-13	
Nitrate (as N)	0.594	MAC = 10	0.010	mg/L	2023-12-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-12-13	
Sulfate	20.8	AO ≤ 500	1.0	mg/L	2023-12-13	

<i>Calculated Parameters</i>						
Hardness, Total (as CaCO3)	118	None Required	0.500	mg/L	N/A	
Langelier Index	-0.7	N/A	-5.0		2023-12-19	CT6
Solids, Total Dissolved	139	AO ≤ 500	1.00	mg/L	N/A	

<i>General Parameters</i>						
Alkalinity, Total (as CaCO3)	102	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Bicarbonate (as CaCO3)	102	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2023-12-13	
Conductivity (EC)	249	N/A	2.0	µS/cm	2023-12-19	
Cyanide, Total	0.0021	MAC = 0.2	0.0020	mg/L	2023-12-16	
pH	7.30	7.0-10.5	0.10	pH units	2023-12-18	HT2
Temperature, at pH	22.6	N/A		°C	2023-12-18	HT2
Turbidity	< 0.10	OG < 1	0.10	NTU	2023-12-13	

<i>Microbiological Parameters</i>						
Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	

<i>Total Metals</i>						
Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2023-12-15	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2023-12-15	
Arsenic, total	0.00078	MAC = 0.01	0.00050	mg/L	2023-12-15	



# TEST RESULTS

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General Potability

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2023-12-19 16:39

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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**#4 West Station (23L1419-02) | Matrix: Water | Sampled: 2023-12-11 10:50, Continued**

**Total Metals, Continued**

Barium, total	0.0329	MAC = 2	0.0050	mg/L	2023-12-15	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2023-12-15	
Cadmium, total	< 0.000010	MAC = 0.007	0.000010	mg/L	2023-12-15	
Calcium, total	37.5	None Required	0.20	mg/L	2023-12-15	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2023-12-15	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2023-12-15	
Copper, total	0.00532	MAC = 2	0.00040	mg/L	2023-12-15	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2023-12-15	
Lead, total	0.00023	MAC = 0.005	0.00020	mg/L	2023-12-15	
Magnesium, total	5.89	None Required	0.010	mg/L	2023-12-15	
Manganese, total	< 0.00020	MAC = 0.12	0.00020	mg/L	2023-12-15	
Mercury, total	< 0.000040	MAC = 0.001	0.000040	mg/L	2023-12-15	HG1
Molybdenum, total	0.00148	N/A	0.00010	mg/L	2023-12-15	
Nickel, total	0.00137	N/A	0.00040	mg/L	2023-12-15	
Potassium, total	1.32	N/A	0.10	mg/L	2023-12-15	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2023-12-15	
Sodium, total	5.16	AO ≤ 200	0.10	mg/L	2023-12-15	
Strontium, total	0.193	MAC = 7	0.0010	mg/L	2023-12-15	
Uranium, total	0.000675	MAC = 0.02	0.000020	mg/L	2023-12-15	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2023-12-15	

**30hp Red Bridge (23L1419-03) | Matrix: Water | Sampled: 2023-12-11 11:10**

**Anions**

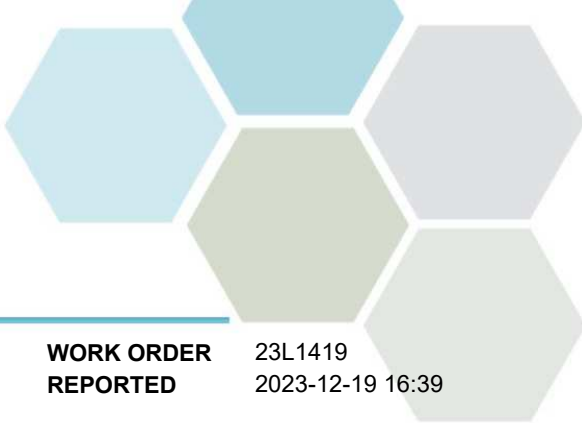
Chloride	4.48	AO ≤ 250	0.10	mg/L	2023-12-13	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2023-12-13	
Nitrate (as N)	0.141	MAC = 10	0.010	mg/L	2023-12-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2023-12-13	
Sulfate	17.1	AO ≤ 500	1.0	mg/L	2023-12-13	

**Calculated Parameters**

Hardness, Total (as CaCO3)	98.8	None Required	0.500	mg/L	N/A	
Langelier Index	-0.9	N/A	-5.0		2023-12-19	CT6
Solids, Total Dissolved	121	AO ≤ 500	1.00	mg/L	N/A	

**General Parameters**

Alkalinity, Total (as CaCO3)	92.8	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Bicarbonate (as CaCO3)	92.8	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2023-12-18	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2023-12-13	
Conductivity (EC)	215	N/A	2.0	µS/cm	2023-12-19	



# TEST RESULTS

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General Potability

**WORK ORDER REPORTED** 23L1419  
2023-12-19 16:39

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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**30hp Red Bridge (23L1419-03) | Matrix: Water | Sampled: 2023-12-11 11:10, Continued**

**General Parameters, Continued**

Cyanide, Total	0.0180	MAC = 0.2	0.0020	mg/L	2023-12-15	
pH	7.16	7.0-10.5	0.10	pH units	2023-12-18	HT2
Temperature, at pH	22.4	N/A		°C	2023-12-18	HT2
Turbidity	0.51	OG < 1	0.10	NTU	2023-12-13	

**Microbiological Parameters**

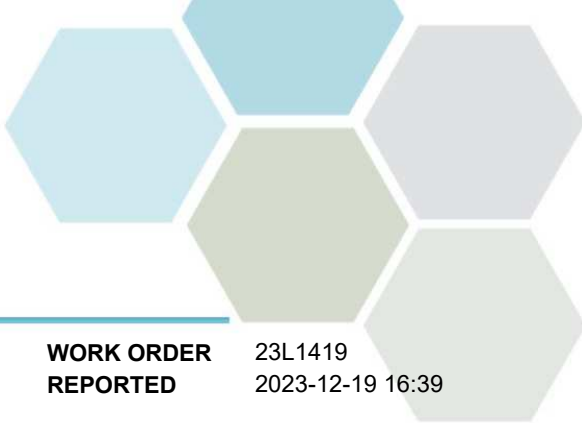
Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2023-12-12	

**Total Metals**

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2023-12-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2023-12-17	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2023-12-17	
Barium, total	0.0308	MAC = 2	0.0050	mg/L	2023-12-17	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2023-12-17	
Cadmium, total	< 0.000010	MAC = 0.007	0.000010	mg/L	2023-12-17	
Calcium, total	31.8	None Required	0.20	mg/L	2023-12-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2023-12-17	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2023-12-17	
Copper, total	0.0103	MAC = 2	0.00040	mg/L	2023-12-17	
Iron, total	0.014	AO ≤ 0.3	0.010	mg/L	2023-12-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2023-12-17	
Magnesium, total	4.67	None Required	0.010	mg/L	2023-12-17	
Manganese, total	0.00024	MAC = 0.12	0.00020	mg/L	2023-12-17	
Mercury, total	< 0.000040	MAC = 0.001	0.000040	mg/L	2023-12-17	HG1
Molybdenum, total	0.00134	N/A	0.00010	mg/L	2023-12-17	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2023-12-17	
Potassium, total	1.02	N/A	0.10	mg/L	2023-12-17	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2023-12-17	
Sodium, total	4.52	AO ≤ 200	0.10	mg/L	2023-12-17	
Strontium, total	0.161	MAC = 7	0.0010	mg/L	2023-12-17	
Uranium, total	0.000523	MAC = 0.02	0.000020	mg/L	2023-12-17	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2023-12-17	

**Sample Qualifiers:**

- CT6 Results were based on lab temperature & lab pH.
- HG1 Sample bottle and preservation submitted is not suitable for Mercury analysis and analyte stability may be affected.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- HT3 Microbiological analysis was initiated beyond the maximum holding time of 30 hours. Results may not be valid.



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO PROJECT** Keremeos Irrigation District  
General Potability

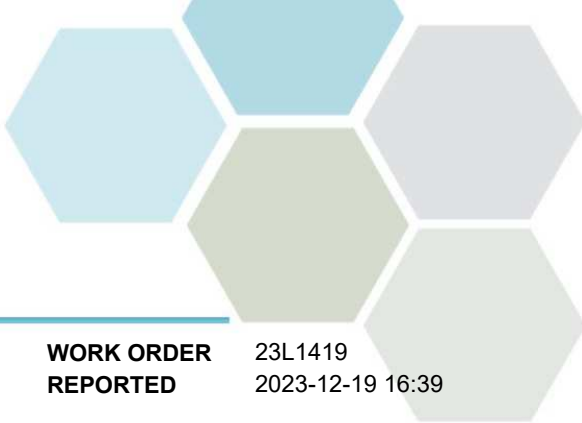
**WORK ORDER REPORTED** 23L1419  
2023-12-19 16:39

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2015)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Colour, True in Water	SM 2120 C (2021)	Spectrophotometry (456 nm)	✓	Kelowna
Conductivity in Water	SM 2510 B (2021)	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* (2015)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Hardness in Water	SM 2340 B* (2021)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Langelier Index in Water	SM 2330 B (2021)	Calculation		N/A
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2021)	SM 1030 E		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 (2020)	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
°C	Degrees Celcius
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
CU	Colour Units (referenced against a platinum cobalt standard)
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:**

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