



CERTIFICATE OF ANALYSIS

REPORTED TO Keremeos Irrigation District
Box 220
Keremeos, BC V0X 1N0

ATTENTION Jo Cottrill

PO NUMBER

PROJECT General Potability

PROJECT INFO

WORK ORDER 8100921

RECEIVED / TEMP 2018-10-10 13:15 / 14°C

REPORTED 2018-10-17 18:34

COC NUMBER No Number

Introduction:

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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.

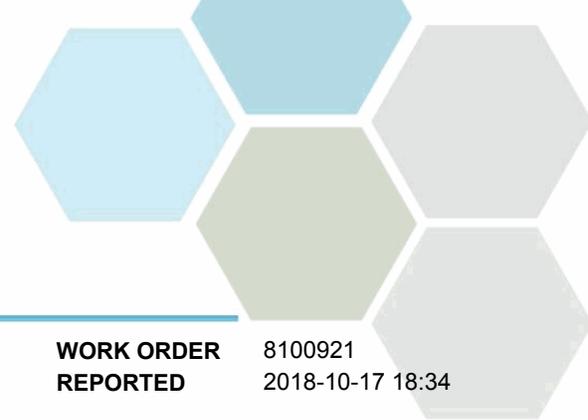
If you have any questions or concerns, please contact me at jshanko@caro.ca

Authorized By:

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TEST RESULTS

REPORTED TO PROJECT Keremeos Irrigation District
General Potability

WORK ORDER REPORTED 8100921
2018-10-17 18:34

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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#4 Pump West Station (8100921-01) | Matrix: Water | Sampled: 2018-10-09 12:20

Anions

Chloride	5.09	AO ≤ 250	0.10 mg/L	2018-10-12	
Fluoride	< 0.10	MAC = 1.5	0.10 mg/L	2018-10-12	
Nitrate (as N)	1.81	MAC = 10	0.010 mg/L	2018-10-12	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-10-12	
Sulfate	23.2	AO ≤ 500	1.0 mg/L	2018-10-12	

Calculated Parameters

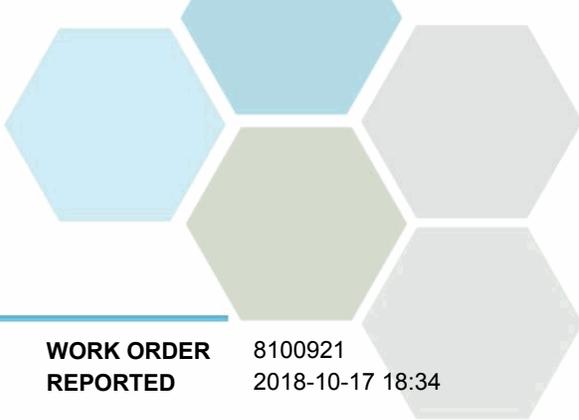
Hardness, Total (as CaCO3)	122	None Required	0.500 mg/L	N/A	
Langelier Index	-0.3	N/A	-5.0 -	2018-10-17	
Solids, Total Dissolved	149	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	100	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Bicarbonate (as CaCO3)	100	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2018-10-11	
Conductivity (EC)	267	N/A	2.0 µS/cm	2018-10-11	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2018-10-15	
pH	7.57	7.0-10.5	0.10 pH units	2018-10-11	HT2
Temperature, at pH	22.9	N/A	°C	2018-10-11	HT2
Turbidity	< 0.10	OG < 1	0.10 NTU	2018-10-11	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2018-10-13	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2018-10-13	
Arsenic, total	0.00079	MAC = 0.01	0.00050 mg/L	2018-10-13	
Barium, total	0.0334	MAC = 1	0.0050 mg/L	2018-10-13	
Boron, total	0.0121	MAC = 5	0.0050 mg/L	2018-10-13	
Cadmium, total	0.000012	MAC = 0.005	0.000010 mg/L	2018-10-13	
Calcium, total	38.8	None Required	0.20 mg/L	2018-10-13	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2018-10-13	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2018-10-13	
Copper, total	0.00902	AO ≤ 1	0.00040 mg/L	2018-10-13	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2018-10-13	
Lead, total	0.00035	MAC = 0.01	0.00020 mg/L	2018-10-13	
Magnesium, total	6.16	None Required	0.010 mg/L	2018-10-13	
Manganese, total	< 0.00020	AO ≤ 0.05	0.00020 mg/L	2018-10-13	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2018-10-12	
Molybdenum, total	0.00154	N/A	0.00010 mg/L	2018-10-13	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2018-10-13	
Potassium, total	1.29	N/A	0.10 mg/L	2018-10-13	



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#4 Pump West Station (8100921-01) | Matrix: Water | Sampled: 2018-10-09 12:20, Continued

Total Metals, Continued

Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2018-10-13	
Sodium, total	5.07	AO ≤ 200	0.10 mg/L	2018-10-13	
Strontium, total	0.202	N/A	0.0010 mg/L	2018-10-13	
Uranium, total	0.000733	MAC = 0.02	0.000020 mg/L	2018-10-13	
Zinc, total	0.0073	AO ≤ 5	0.0040 mg/L	2018-10-13	

10hp Red Bridge (8100921-02) | Matrix: Water | Sampled: 2018-10-09 12:40

Anions

Chloride	4.68	AO ≤ 250	0.10 mg/L	2018-10-12	
Fluoride	< 0.10	MAC = 1.5	0.10 mg/L	2018-10-12	
Nitrate (as N)	0.215	MAC = 10	0.010 mg/L	2018-10-12	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-10-12	
Sulfate	17.5	AO ≤ 500	1.0 mg/L	2018-10-12	

Calculated Parameters

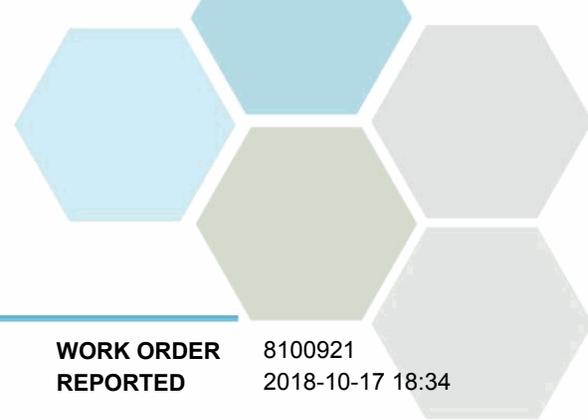
Hardness, Total (as CaCO3)	98.7	None Required	0.500 mg/L	N/A	
Langelier Index	-0.4	N/A	-5.0 -	2018-10-17	
Solids, Total Dissolved	116	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	84.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Bicarbonate (as CaCO3)	84.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2018-10-11	
Conductivity (EC)	216	N/A	2.0 µS/cm	2018-10-11	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2018-10-15	
pH	7.59	7.0-10.5	0.10 pH units	2018-10-11	HT2
Temperature, at pH	23.0	N/A	°C	2018-10-11	HT2
Turbidity	0.30	OG < 1	0.10 NTU	2018-10-11	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2018-10-13	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2018-10-13	
Arsenic, total	0.00058	MAC = 0.01	0.00050 mg/L	2018-10-13	
Barium, total	0.0295	MAC = 1	0.0050 mg/L	2018-10-13	
Boron, total	0.0052	MAC = 5	0.0050 mg/L	2018-10-13	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2018-10-13	
Calcium, total	31.5	None Required	0.20 mg/L	2018-10-13	
Chromium, total	0.00063	MAC = 0.05	0.00050 mg/L	2018-10-13	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2018-10-13	



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10hp Red Bridge (8100921-02) Matrix: Water Sampled: 2018-10-09 12:40, Continued					
<i>Total Metals, Continued</i>					
Copper, total	0.00248	AO ≤ 1	0.00040 mg/L	2018-10-13	
Iron, total	0.017	AO ≤ 0.3	0.010 mg/L	2018-10-13	
Lead, total	0.00021	MAC = 0.01	0.00020 mg/L	2018-10-13	
Magnesium, total	4.87	None Required	0.010 mg/L	2018-10-13	
Manganese, total	0.00081	AO ≤ 0.05	0.00020 mg/L	2018-10-13	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2018-10-12	
Molybdenum, total	0.00138	N/A	0.00010 mg/L	2018-10-13	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2018-10-13	
Potassium, total	1.06	N/A	0.10 mg/L	2018-10-13	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2018-10-13	
Sodium, total	4.42	AO ≤ 200	0.10 mg/L	2018-10-13	
Strontium, total	0.160	N/A	0.0010 mg/L	2018-10-13	
Uranium, total	0.000564	MAC = 0.02	0.000020 mg/L	2018-10-13	
Zinc, total	0.0109	AO ≤ 5	0.0040 mg/L	2018-10-13	

#4 Pump East Station (8100921-03) | Matrix: Water | Sampled: 2018-10-09 13:00

Anions

Chloride	14.3	AO ≤ 250	0.10 mg/L	2018-10-12	
Fluoride	< 0.10	MAC = 1.5	0.10 mg/L	2018-10-12	
Nitrate (as N)	1.74	MAC = 10	0.010 mg/L	2018-10-12	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2018-10-12	
Sulfate	65.7	AO ≤ 500	1.0 mg/L	2018-10-12	

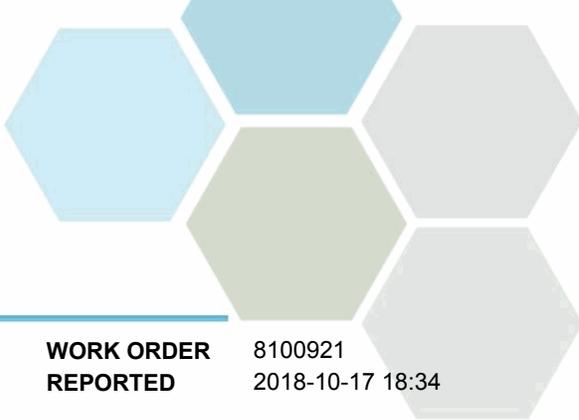
Calculated Parameters

Hardness, Total (as CaCO ₃)	255	None Required	0.500 mg/L	N/A	
Langelier Index	0.6	N/A	-5.0 -	2018-10-17	
Solids, Total Dissolved	307	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO ₃)	185	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Bicarbonate (as CaCO ₃)	185	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2018-10-11	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2018-10-11	
Conductivity (EC)	521	N/A	2.0 µS/cm	2018-10-11	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2018-10-15	
pH	7.84	7.0-10.5	0.10 pH units	2018-10-11	HT2
Temperature, at pH	23.2	N/A	°C	2018-10-11	HT2
Turbidity	< 0.10	OG < 1	0.10 NTU	2018-10-11	

Total Metals



TEST RESULTS

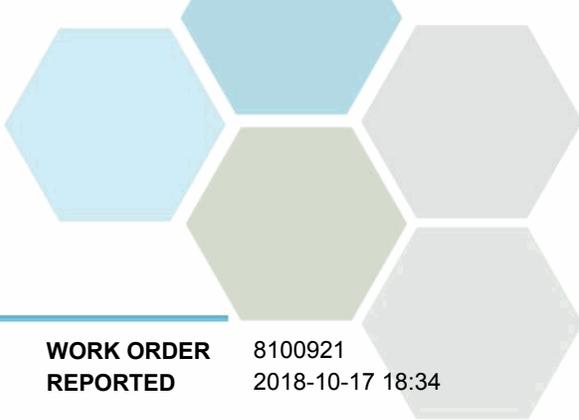
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#4 Pump East Station (8100921-03) Matrix: Water Sampled: 2018-10-09 13:00, Continued					
<i>Total Metals, Continued</i>					
Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2018-10-13	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2018-10-13	
Arsenic, total	0.00100	MAC = 0.01	0.00050 mg/L	2018-10-13	
Barium, total	0.0348	MAC = 1	0.0050 mg/L	2018-10-13	
Boron, total	0.0200	MAC = 5	0.0050 mg/L	2018-10-13	
Cadmium, total	0.000021	MAC = 0.005	0.000010 mg/L	2018-10-13	
Calcium, total	79.5	None Required	0.20 mg/L	2018-10-13	
Chromium, total	0.00069	MAC = 0.05	0.00050 mg/L	2018-10-13	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2018-10-13	
Copper, total	0.00272	AO ≤ 1	0.00040 mg/L	2018-10-13	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2018-10-13	
Lead, total	< 0.00020	MAC = 0.01	0.00020 mg/L	2018-10-13	
Magnesium, total	13.7	None Required	0.010 mg/L	2018-10-13	
Manganese, total	0.00035	AO ≤ 0.05	0.00020 mg/L	2018-10-13	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2018-10-12	
Molybdenum, total	0.00285	N/A	0.00010 mg/L	2018-10-13	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2018-10-13	
Potassium, total	2.49	N/A	0.10 mg/L	2018-10-13	
Selenium, total	0.00140	MAC = 0.05	0.00050 mg/L	2018-10-13	
Sodium, total	11.3	AO ≤ 200	0.10 mg/L	2018-10-13	
Strontium, total	0.447	N/A	0.0010 mg/L	2018-10-13	
Uranium, total	0.00223	MAC = 0.02	0.000020 mg/L	2018-10-13	
Zinc, total	0.0044	AO ≤ 5	0.0040 mg/L	2018-10-13	

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 PROJECT Keremeos Irrigation District
General Potability

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Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2011)	Titration with H2SO4	Kelowna
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Kelowna
Colour, True in Water	SM 2120 C (2011)	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	Kelowna
Hardness in Water	SM 2340 B* (2011)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	N/A
Langelier Index in Water	SM 2330 B (2010)	Calculation	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
pH in Water	SM 4500-H+ B (2011)	Electrometry	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2011)	Calculation: $100 \times \frac{[Cations]-[Anions]}{[Cations]+[Anions]}$	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 (2011)	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
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

General Comments:

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