



CERTIFICATE OF ANALYSIS

REPORTED TO Mid Shuswap Lumby Water Stewards
1631 Mable Lake Rd
Lumby, BC V0E 2G6

ATTENTION Russ Collins

PO NUMBER Mid Shuswap Lumby Water Stewards
PROJECT Analytical Testing

PROJECT INFO

WORK ORDER 7111167

RECEIVED / TEMP 2017-11-15 09:14 / 4°C
REPORTED 2017-11-22 13:08

COC NUMBER No COC

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.

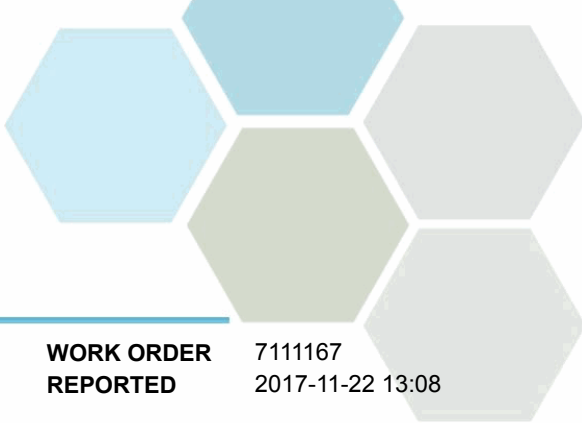
If you have any questions or concerns, please contact me at kmckeown@caro.ca

Authorized By:

Kristin McKeown
Account Manager

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 Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Duteau Creek (Hwy 6) (7111167-01) Matrix: Water Sampled: 2017-11-14 11:00						F1, FILT, PRES

Anions

Chloride	10.2	AO ≤ 250	0.10	mg/L	2017-11-17	
Nitrate (as N)	0.544	MAC = 10	0.010	mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2017-11-17	
Sulfate	31.2	AO ≤ 500	1.0	mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	0.020	None Required	0.020	mg/L	2017-11-18	
Conductivity (EC)	292	N/A	2.0	µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	0.155	N/A	0.050	mg/L	2017-11-17	
pH	8.01	7.0-10.5	0.10	pH units	2017-11-15	HT2
Phosphorus, Total (as P)	0.0132	N/A	0.0020	mg/L	2017-11-16	
Phosphorus, Total Dissolved	0.0113	N/A	0.0020	mg/L	2017-11-16	
Turbidity	1.05	OG < 1	0.10	NTU	2017-11-14	

Calculated Parameters

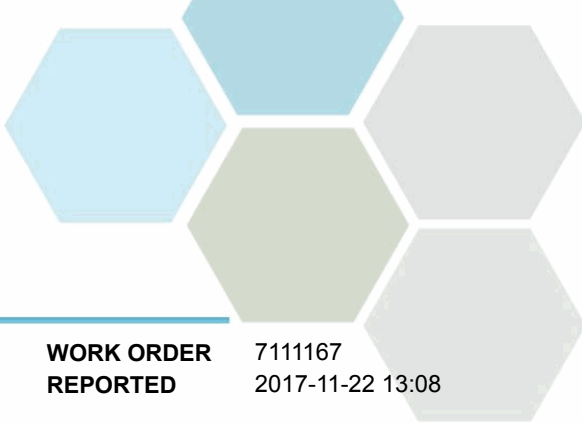
Hardness, Total (as CaCO3)	115	None Required	0.100	mg/L	N/A	
Nitrate+Nitrite (as N)	0.544	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.700	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	8.5	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	21.4	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	0.063	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.363	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	23.8	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	5.9	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0064	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	34600	N/A	40	µg/L	2017-11-21	
Chromium, total	0.65	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0646	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.81	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	264	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	2.16	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	6990	N/A	5.0	µg/L	2017-11-21	
Manganese, total	47.3	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	1.72	N/A	0.010	µg/L	2017-11-21	
Nickel, total	0.896	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	14	N/A	10	µg/L	2017-11-21	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Duteau Creek (Hwy 6) (7111167-01) Matrix: Water Sampled: 2017-11-14 11:00, Continued					F1, FILT, PRES

Total Metals, Continued

Potassium, total	3220	N/A	10 µg/L	2017-11-21	
Selenium, total	0.73	MAC = 50	0.10 µg/L	2017-11-21	
Silicon, total	5800	N/A	100 µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010 µg/L	2017-11-21	
Sodium, total	6840	AO ≤ 200000	20 µg/L	2017-11-21	
Strontium, total	190	N/A	0.10 µg/L	2017-11-21	
Sulfur, total	8900	N/A	1000 µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050 µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040 µg/L	2017-11-21	
Thorium, total	0.012	N/A	0.010 µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050 µg/L	2017-11-21	
Titanium, total	1.21	N/A	0.20 µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20 µg/L	2017-11-21	
Uranium, total	1.31	MAC = 20	0.0010 µg/L	2017-11-21	
Vanadium, total	0.61	N/A	0.20 µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0 µg/L	2017-11-21	
Zirconium, total	0.206	N/A	0.020 µg/L	2017-11-21	

Microbiological Parameters

Coliforms, Total	130	MAC = 0	1 CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200 CFU/100 mL	2017-11-15	
E. coli	10	MAC = 0	1 CFU/100 mL	2017-11-15	

Harris Creek (Hwy 6) (7111167-02) | Matrix: Water | Sampled: 2017-11-14 10:50

F1, FILT, PRES

Anions

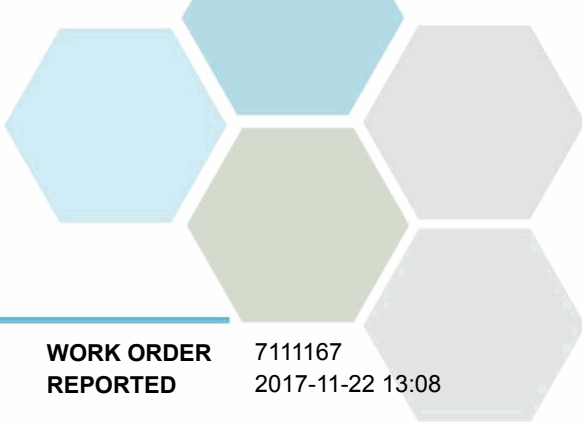
Chloride	3.71	AO ≤ 250	0.10 mg/L	2017-11-17	
Nitrate (as N)	0.038	MAC = 10	0.010 mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2017-11-17	
Sulfate	32.9	AO ≤ 500	1.0 mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	0.024	None Required	0.020 mg/L	2017-11-18	
Conductivity (EC)	335	N/A	2.0 µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	0.164	N/A	0.050 mg/L	2017-11-17	
pH	8.05	7.0-10.5	0.10 pH units	2017-11-15	HT2
Phosphorus, Total (as P)	0.0186	N/A	0.0020 mg/L	2017-11-16	
Phosphorus, Total Dissolved	0.0159	N/A	0.0020 mg/L	2017-11-16	
Turbidity	0.62	OG < 1	0.10 NTU	2017-11-14	

Calculated Parameters

Hardness, Total (as CaCO3)	154	None Required	0.100 mg/L	N/A	
----------------------------	-----	---------------	------------	-----	--



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Harris Creek (Hwy 6) (7111167-02) Matrix: Water Sampled: 2017-11-14 10:50, Continued						F1, FILT, PRES

Calculated Parameters, Continued

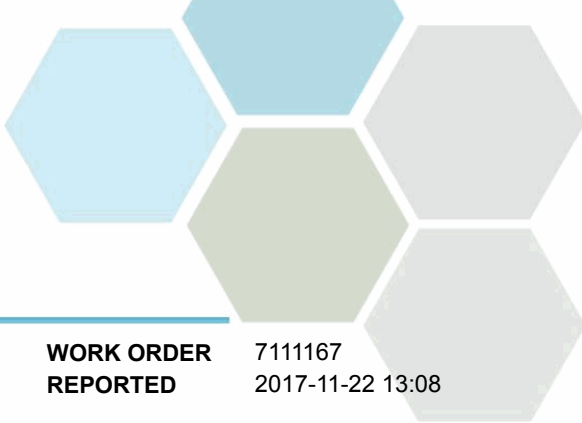
Nitrate+Nitrite (as N)	0.0380	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.202	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	1.5	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	9.0	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	0.077	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	1.26	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	20.3	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	5.3	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0080	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	46400	N/A	40	µg/L	2017-11-21	
Chromium, total	0.65	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0761	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.64	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	238	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	4.36	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	9110	N/A	5.0	µg/L	2017-11-21	
Manganese, total	50.7	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	2.90	N/A	0.010	µg/L	2017-11-21	
Nickel, total	1.34	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	26	N/A	10	µg/L	2017-11-21	
Potassium, total	3190	N/A	10	µg/L	2017-11-21	
Selenium, total	0.59	MAC = 50	0.10	µg/L	2017-11-21	
Silicon, total	7720	N/A	100	µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Sodium, total	7940	AO ≤ 200000	20	µg/L	2017-11-21	
Strontium, total	236	N/A	0.10	µg/L	2017-11-21	
Sulfur, total	10600	N/A	1000	µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040	µg/L	2017-11-21	
Thorium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Titanium, total	0.81	N/A	0.20	µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Uranium, total	1.74	MAC = 20	0.0010	µg/L	2017-11-21	
Vanadium, total	0.76	N/A	0.20	µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0	µg/L	2017-11-21	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Harris Creek (Hwy 6) (7111167-02) Matrix: Water Sampled: 2017-11-14 10:50, Continued						F1, FILT, PRES

Total Metals, Continued

Zirconium, total	0.098	N/A	0.020	µg/L	2017-11-21	
------------------	-------	-----	-------	------	------------	--

Microbiological Parameters

Coliforms, Total	550	MAC = 0	1	CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200	CFU/100 mL	2017-11-15	
E. coli	50	MAC = 0	1	CFU/100 mL	2017-11-15	

Lower Besette Creek (7111167-03) | Matrix: Water | Sampled: 2017-11-14 10:00

F1, FILT, PRES

Anions

Chloride	9.05	AO ≤ 250	0.10	mg/L	2017-11-17	
Nitrate (as N)	0.253	MAC = 10	0.010	mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2017-11-17	
Sulfate	36.1	AO ≤ 500	1.0	mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	0.037	None Required	0.020	mg/L	2017-11-18	
Conductivity (EC)	353	N/A	2.0	µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	0.226	N/A	0.050	mg/L	2017-11-17	
pH	8.18	7.0-10.5	0.10	pH units	2017-11-15	HT2
Phosphorus, Total (as P)	0.0339	N/A	0.0020	mg/L	2017-11-16	
Phosphorus, Total Dissolved	0.0111	N/A	0.0020	mg/L	2017-11-16	
Turbidity	8.98	OG < 1	0.10	NTU	2017-11-14	

Calculated Parameters

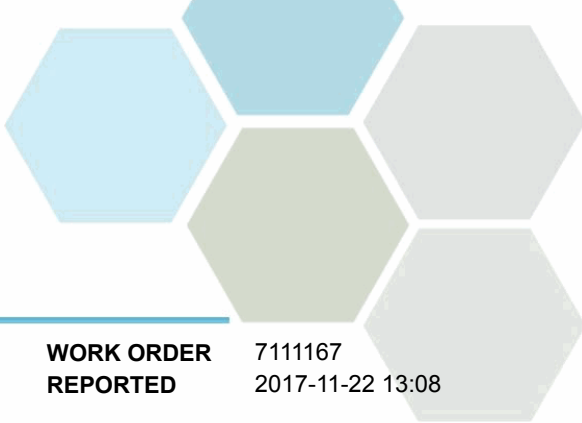
Hardness, Total (as CaCO3)	161	None Required	0.100	mg/L	N/A	
Nitrate+Nitrite (as N)	0.253	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.479	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	3.3	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	663	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	0.095	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.838	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	35.6	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	0.024	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	0.011	N/A	0.010	µg/L	2017-11-21	
Boron, total	6.0	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0403	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	48700	N/A	40	µg/L	2017-11-21	
Chromium, total	2.68	MAC = 50	0.10	µg/L	2017-11-21	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Lower Bessette Creek (7111167-03) Matrix: Water Sampled: 2017-11-14 10:00, Continued						F1, FILT, PRES

Total Metals, Continued

Cobalt, total	0.588	N/A	0.0050	µg/L	2017-11-21	
Copper, total	2.53	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	1230	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	0.403	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	4.09	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	9520	N/A	5.0	µg/L	2017-11-21	
Manganese, total	34.1	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	2.57	N/A	0.010	µg/L	2017-11-21	
Nickel, total	2.73	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	39	N/A	10	µg/L	2017-11-21	
Potassium, total	3360	N/A	10	µg/L	2017-11-21	
Selenium, total	1.25	MAC = 50	0.10	µg/L	2017-11-21	
Silicon, total	7090	N/A	100	µg/L	2017-11-21	
Silver, total	0.016	N/A	0.010	µg/L	2017-11-21	
Sodium, total	9150	AO ≤ 200000	20	µg/L	2017-11-21	
Strontium, total	284	N/A	0.10	µg/L	2017-11-21	
Sulfur, total	11600	N/A	1000	µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040	µg/L	2017-11-21	
Thorium, total	0.146	N/A	0.010	µg/L	2017-11-21	
Tin, total	0.068	N/A	0.050	µg/L	2017-11-21	
Titanium, total	57.6	N/A	0.20	µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Uranium, total	2.08	MAC = 20	0.0010	µg/L	2017-11-21	
Vanadium, total	2.84	N/A	0.20	µg/L	2017-11-21	
Zinc, total	4.5	AO ≤ 5000	1.0	µg/L	2017-11-21	
Zirconium, total	0.213	N/A	0.020	µg/L	2017-11-21	

Microbiological Parameters

Coliforms, Total	870	MAC = 0	1	CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200	CFU/100 mL	2017-11-15	
E. coli	76	MAC = 0	1	CFU/100 mL	2017-11-15	

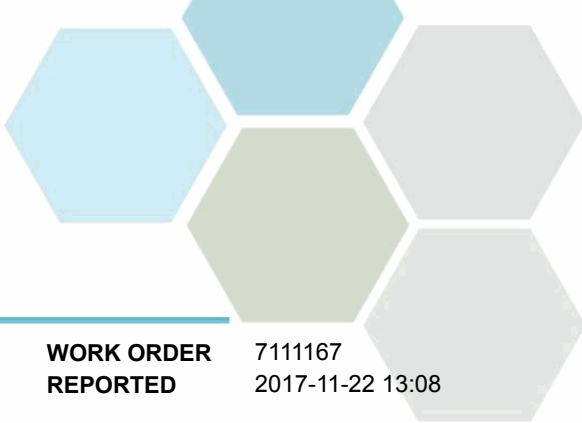
Mid Bessette Creek (7111167-04) | Matrix: Water | Sampled: 2017-11-14 10:15

F1, FILT, PRES

Anions

Chloride	8.50	AO ≤ 250	0.10	mg/L	2017-11-17	
Nitrate (as N)	0.252	MAC = 10	0.010	mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2017-11-17	
Sulfate	35.2	AO ≤ 500	1.0	mg/L	2017-11-17	

General Parameters



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Mid Bessette Creek (7111167-04) Matrix: Water Sampled: 2017-11-14 10:15, Continued						F1, FILT, PRES

General Parameters, Continued

Ammonia, Total (as N)	0.029	None Required	0.020	mg/L	2017-11-18	
Conductivity (EC)	343	N/A	2.0	µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	0.148	N/A	0.050	mg/L	2017-11-17	
pH	8.12	7.0-10.5	0.10	pH units	2017-11-15	HT2
Phosphorus, Total (as P)	0.0205	N/A	0.0020	mg/L	2017-11-16	
Phosphorus, Total Dissolved	0.0143	N/A	0.0020	mg/L	2017-11-16	
Turbidity	1.09	OG < 1	0.10	NTU	2017-11-14	

Calculated Parameters

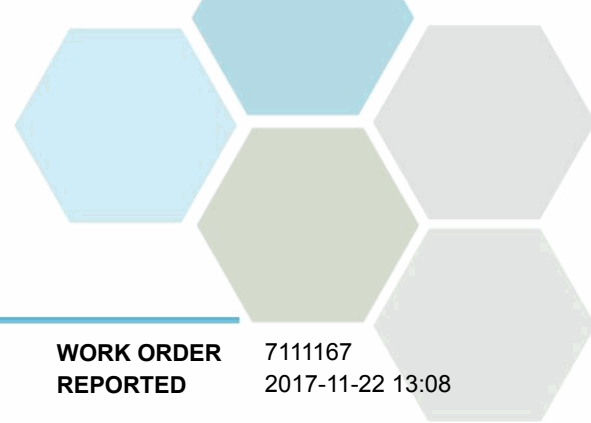
Hardness, Total (as CaCO3)	144	None Required	0.100	mg/L	N/A	
Nitrate+Nitrite (as N)	0.252	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.400	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	2.3	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	37.8	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	0.066	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.607	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	25.4	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	5.6	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0114	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	44200	N/A	40	µg/L	2017-11-21	
Chromium, total	0.70	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0867	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.75	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	220	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	3.23	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	8100	N/A	5.0	µg/L	2017-11-21	
Manganese, total	37.8	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	2.32	N/A	0.010	µg/L	2017-11-21	
Nickel, total	1.15	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	20	N/A	10	µg/L	2017-11-21	
Potassium, total	2930	N/A	10	µg/L	2017-11-21	
Selenium, total	1.25	MAC = 50	0.10	µg/L	2017-11-21	
Silicon, total	5960	N/A	100	µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Sodium, total	7990	AO ≤ 200000	20	µg/L	2017-11-21	
Strontium, total	246	N/A	0.10	µg/L	2017-11-21	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Mid Bessette Creek (7111167-04) Matrix: Water Sampled: 2017-11-14 10:15, Continued						F1, FILT, PRES

Total Metals, Continued

Sulfur, total	10600	N/A	1000	µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040	µg/L	2017-11-21	
Thorium, total	0.014	N/A	0.010	µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Titanium, total	2.34	N/A	0.20	µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Uranium, total	1.68	MAC = 20	0.0010	µg/L	2017-11-21	
Vanadium, total	0.65	N/A	0.20	µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0	µg/L	2017-11-21	
Zirconium, total	0.131	N/A	0.020	µg/L	2017-11-21	

Microbiological Parameters

Coliforms, Total	300	MAC = 0	1	CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200	CFU/100 mL	2017-11-15	
E. coli	42	MAC = 0	1	CFU/100 mL	2017-11-15	

Vance Creek (Mabel Lake Road) (7111167-05) | Matrix: Water | Sampled: 2017-11-14 10:30

F1, FILT, PRES

Anions

Chloride	3.49	AO ≤ 250	0.10	mg/L	2017-11-17	
Nitrate (as N)	0.027	MAC = 10	0.010	mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2017-11-17	
Sulfate	38.8	AO ≤ 500	1.0	mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020	mg/L	2017-11-18	
Conductivity (EC)	420	N/A	2.0	µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050	mg/L	2017-11-17	
pH	8.30	7.0-10.5	0.10	pH units	2017-11-15	HT2
Phosphorus, Total (as P)	< 0.0020	N/A	0.0020	mg/L	2017-11-16	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020	mg/L	2017-11-16	
Turbidity	0.20	OG < 1	0.10	NTU	2017-11-14	

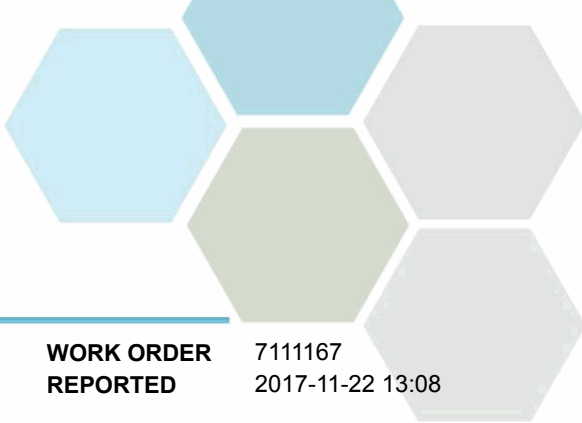
Calculated Parameters

Hardness, Total (as CaCO3)	189	None Required	0.100	mg/L	N/A	
Nitrate+Nitrite (as N)	0.0269	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	< 1.0	N/A	1.0	µg/L	2017-11-22	
---------------------	-------	-----	-----	------	------------	--

Total Metals



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

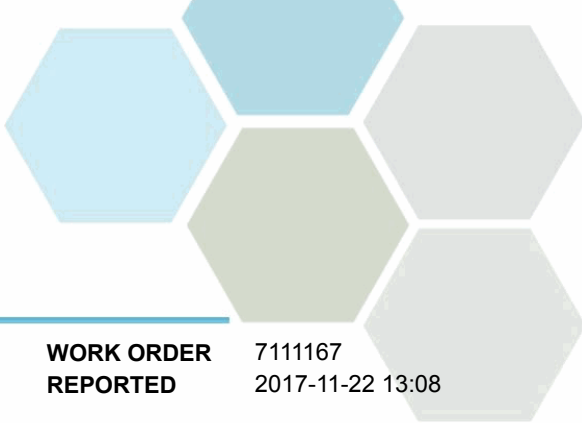
Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vance Creek (Mabel Lake Road) (7111167-05) Matrix: Water Sampled: 2017-11-14 10:30, Continued						F1, FILT, PRES

Total Metals, Continued

Aluminum, total	3.1	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	0.057	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.260	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	31.7	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	2.8	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0213	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	64000	N/A	40	µg/L	2017-11-21	
Chromium, total	0.82	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0139	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.27	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	9.4	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	2.71	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	7110	N/A	5.0	µg/L	2017-11-21	
Manganese, total	0.675	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	2.50	N/A	0.010	µg/L	2017-11-21	
Nickel, total	0.193	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	< 10	N/A	10	µg/L	2017-11-21	
Potassium, total	1730	N/A	10	µg/L	2017-11-21	
Selenium, total	3.53	MAC = 50	0.10	µg/L	2017-11-21	
Silicon, total	5930	N/A	100	µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Sodium, total	3600	AO ≤ 200000	20	µg/L	2017-11-21	
Strontium, total	394	N/A	0.10	µg/L	2017-11-21	
Sulfur, total	10500	N/A	1000	µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040	µg/L	2017-11-21	
Thorium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Titanium, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Uranium, total	1.85	MAC = 20	0.0010	µg/L	2017-11-21	
Vanadium, total	0.27	N/A	0.20	µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0	µg/L	2017-11-21	
Zirconium, total	< 0.020	N/A	0.020	µg/L	2017-11-21	

Microbiological Parameters

Coliforms, Total	130	MAC = 0	1	CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200	CFU/100 mL	2017-11-15	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2017-11-15	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Shuswap River (Wilsey Dam) (7111167-06) Matrix: Water Sampled: 2017-11-14 09:48						F1, FILT, PRES

Anions

Chloride	0.46	AO ≤ 250	0.10	mg/L	2017-11-17	
Nitrate (as N)	0.038	MAC = 10	0.010	mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2017-11-17	
Sulfate	6.8	AO ≤ 500	1.0	mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	0.021	None Required	0.020	mg/L	2017-11-18	
Conductivity (EC)	115	N/A	2.0	µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050	mg/L	2017-11-17	
pH	7.97	7.0-10.5	0.10	pH units	2017-11-15	HT2
Phosphorus, Total (as P)	< 0.0020	N/A	0.0020	mg/L	2017-11-16	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020	mg/L	2017-11-16	
Turbidity	0.28	OG < 1	0.10	NTU	2017-11-14	

Calculated Parameters

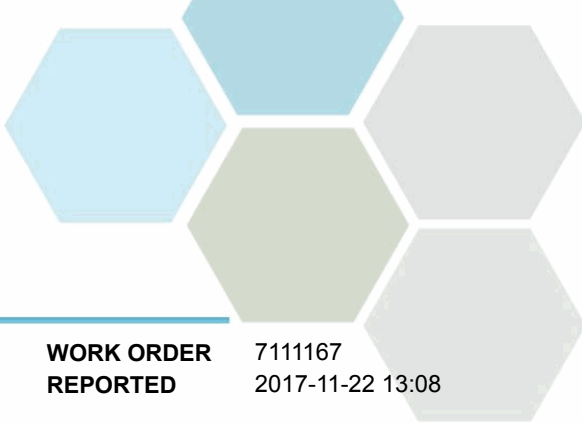
Hardness, Total (as CaCO3)	45.5	None Required	0.100	mg/L	N/A	
Nitrate+Nitrite (as N)	0.0381	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	5.5	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	10.1	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	< 0.050	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.147	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	9.11	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	< 2.0	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0045	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	15000	N/A	40	µg/L	2017-11-21	
Chromium, total	0.61	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0076	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.29	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	20.2	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	0.626	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	1950	N/A	5.0	µg/L	2017-11-21	
Manganese, total	2.26	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	0.733	N/A	0.010	µg/L	2017-11-21	
Nickel, total	0.167	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	< 10	N/A	10	µg/L	2017-11-21	



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Shuswap River (Wilsey Dam) (7111167-06) Matrix: Water Sampled: 2017-11-14 09:48, Continued					F1, FILT, PRES

Total Metals, Continued

Potassium, total	770	N/A	10 µg/L	2017-11-21	
Selenium, total	0.44	MAC = 50	0.10 µg/L	2017-11-21	
Silicon, total	2540	N/A	100 µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010 µg/L	2017-11-21	
Sodium, total	1170	AO ≤ 200000	20 µg/L	2017-11-21	
Strontium, total	71.0	N/A	0.10 µg/L	2017-11-21	
Sulfur, total	1700	N/A	1000 µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050 µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040 µg/L	2017-11-21	
Thorium, total	< 0.010	N/A	0.010 µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050 µg/L	2017-11-21	
Titanium, total	0.30	N/A	0.20 µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20 µg/L	2017-11-21	
Uranium, total	0.428	MAC = 20	0.0010 µg/L	2017-11-21	
Vanadium, total	0.32	N/A	0.20 µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0 µg/L	2017-11-21	
Zirconium, total	0.021	N/A	0.020 µg/L	2017-11-21	

Microbiological Parameters

Coliforms, Total	21	MAC = 0	1 CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200 CFU/100 mL	2017-11-15	
E. coli	2	MAC = 0	1 CFU/100 mL	2017-11-15	

Shuswap River (Odd Fellows) (7111167-07) | Matrix: Water | Sampled: 2017-11-14 09:20

F1, FILT, PRES

Anions

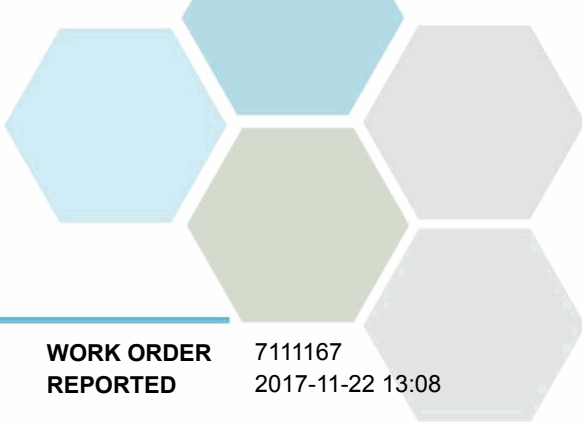
Chloride	1.08	AO ≤ 250	0.10 mg/L	2017-11-17	
Nitrate (as N)	0.037	MAC = 10	0.010 mg/L	2017-11-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2017-11-17	
Sulfate	10.0	AO ≤ 500	1.0 mg/L	2017-11-17	

General Parameters

Ammonia, Total (as N)	0.020	None Required	0.020 mg/L	2017-11-18	
Conductivity (EC)	132	N/A	2.0 µS/cm	2017-11-15	
Nitrogen, Total Kjeldahl	0.108	N/A	0.050 mg/L	2017-11-17	
pH	7.85	7.0-10.5	0.10 pH units	2017-11-15	HT2
Phosphorus, Total (as P)	< 0.0020	N/A	0.0020 mg/L	2017-11-16	
Phosphorus, Total Dissolved	< 0.0020	N/A	0.0020 mg/L	2017-11-16	
Turbidity	0.49	OG < 1	0.10 NTU	2017-11-14	

Calculated Parameters

Hardness, Total (as CaCO3)	53.9	None Required	0.100 mg/L	N/A	
----------------------------	------	---------------	------------	-----	--



TEST RESULTS

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Shuswap River (Odd Fellows) (7111167-07) Matrix: Water Sampled: 2017-11-14 09:20, Continued						F1, FILT, PRES

Calculated Parameters, Continued

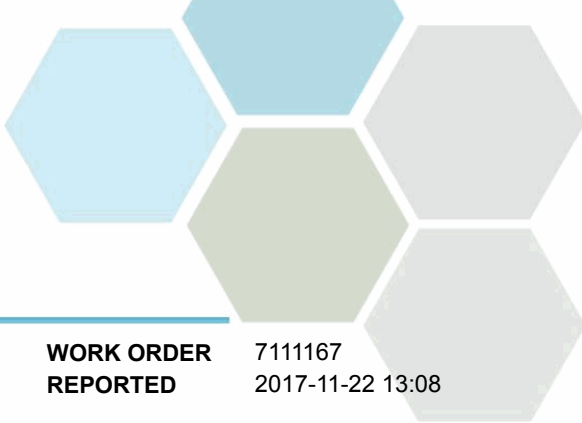
Nitrate+Nitrite (as N)	0.0372	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.145	N/A	0.0500	mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	5.2	N/A	1.0	µg/L	2017-11-22	
---------------------	-----	-----	-----	------	------------	--

Total Metals

Aluminum, total	11.2	OG < 100	2.0	µg/L	2017-11-21	
Antimony, total	< 0.050	MAC = 6	0.050	µg/L	2017-11-21	
Arsenic, total	0.191	MAC = 10	0.050	µg/L	2017-11-21	
Barium, total	10.4	MAC = 1000	0.10	µg/L	2017-11-21	
Beryllium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Bismuth, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Boron, total	< 2.0	MAC = 5000	2.0	µg/L	2017-11-21	
Cadmium, total	0.0082	MAC = 5	0.0020	µg/L	2017-11-21	
Calcium, total	17600	N/A	40	µg/L	2017-11-21	
Chromium, total	0.71	MAC = 50	0.10	µg/L	2017-11-21	
Cobalt, total	0.0168	N/A	0.0050	µg/L	2017-11-21	
Copper, total	0.32	AO ≤ 1000	0.20	µg/L	2017-11-21	
Iron, total	45.5	AO ≤ 300	2.0	µg/L	2017-11-21	
Lead, total	< 0.050	MAC = 10	0.050	µg/L	2017-11-21	
Lithium, total	0.790	N/A	0.050	µg/L	2017-11-21	
Magnesium, total	2430	N/A	5.0	µg/L	2017-11-21	
Manganese, total	8.90	AO ≤ 50	0.050	µg/L	2017-11-21	
Molybdenum, total	0.930	N/A	0.010	µg/L	2017-11-21	
Nickel, total	0.213	N/A	0.040	µg/L	2017-11-21	
Phosphorus, total	< 10	N/A	10	µg/L	2017-11-21	
Potassium, total	904	N/A	10	µg/L	2017-11-21	
Selenium, total	0.48	MAC = 50	0.10	µg/L	2017-11-21	
Silicon, total	2770	N/A	100	µg/L	2017-11-21	
Silver, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Sodium, total	1620	AO ≤ 200000	20	µg/L	2017-11-21	
Strontium, total	85.4	N/A	0.10	µg/L	2017-11-21	
Sulfur, total	2300	N/A	1000	µg/L	2017-11-21	
Tellurium, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Thallium, total	< 0.0040	N/A	0.0040	µg/L	2017-11-21	
Thorium, total	< 0.010	N/A	0.010	µg/L	2017-11-21	
Tin, total	< 0.050	N/A	0.050	µg/L	2017-11-21	
Titanium, total	0.40	N/A	0.20	µg/L	2017-11-21	
Tungsten, total	< 0.20	N/A	0.20	µg/L	2017-11-21	
Uranium, total	0.564	MAC = 20	0.0010	µg/L	2017-11-21	
Vanadium, total	0.35	N/A	0.20	µg/L	2017-11-21	
Zinc, total	< 1.0	AO ≤ 5000	1.0	µg/L	2017-11-21	



TEST RESULTS

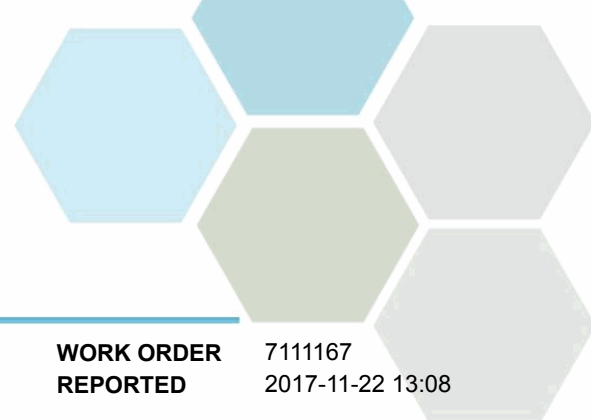
REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards
Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Shuswap River (Odd Fellows) (7111167-07) Matrix: Water Sampled: 2017-11-14 09:20, Continued					F1, FILT, PRES
<i>Total Metals, Continued</i>					
Zirconium, total	0.022	N/A	0.020 µg/L	2017-11-21	
<i>Microbiological Parameters</i>					
Coliforms, Total	110	MAC = 0	1 CFU/100 mL	2017-11-15	
Background Colonies	> 200	N/A	200 CFU/100 mL	2017-11-15	
E. coli	1	MAC = 0	1 CFU/100 mL	2017-11-15	

Sample Qualifiers:

- F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.
- FILT The sample has been filtered for DP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TP, DP, TN, NH3 in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards
Analytical Testing

WORK ORDER REPORTED 7111167
2017-11-22 13:08

Analysis Description	Method Ref.	Technique	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2011)	Automated Colorimetry (Phenate)	Kelowna
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Kelowna
Coliforms, Total in Water	SM 9222 B (2006)	Membrane Filtration / m-Endo Agar	Kelowna
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
E. coli in Water	SM 9222 G (2006)	Membrane Filtration / Nutrient Agar with MUG	Kelowna
Hardness in Water	SM 2340 B* (2011)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2011)	Block Digestion and Flow Injection Analysis	Kelowna
pH in Water	SM 4500-H+ B (2011)	Electrometry	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2011)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2011)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
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
>	Greater than the specified Result
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
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre
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 \(Health Canada, Feb 2017\)](#)

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