LABERGE ENVIRONMENTAL
ATTN: Bonnie Burns
PO Box 21072
Whitehorse YT Y1A 6P7

Date Received: 12-SEP-16
Report Date: 29-SEP-16 11:58 (MT)
Version: FINAL

Client Phone: 867-668-6838

Certificate of Analysis

Lab Work Order #: L1829615

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 14-470932, 14-470930
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1829615-1	L1829615-2	L1829615-3	L1829615-4	L1829615-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	06-SEP-16	07-SEP-16	06-SEP-16	06-SEP-16	05-SEP-16
	Sampled Time	14:30	09:40	16:30	09:00	13:10
	Client ID	E-1	PORCUPINE CR	E-2	E-3	E-4
Grouping	**Analyte**					
BIOTA						
Plant Pigments	Chlorophyll a (ug)	70.6	37.4	87.0	26.4	31.9
	Pheophytin a (ug)	56.0	31.7	75.1	19.6	27.5

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1829615-6 Water 05-SEP-16 09:30 E-6	L1829615-7 Water 08-SEP-16 14:50 E-8	L1829615-9 Water 07-SEP-16 15:00 R-2	L1829615-10 Water 06-SEP-16 11:30 R-3	L1829615-11 Water 05-SEP-16 11:40 R-4
Sample ID **Description** **Sampled Date** **Sampled Time** **Client ID**						
BIOTA						
Plant Pigments	Chlorophyll a (ug)	24.1	11.3	16.5	22.0	0.126
	Pheophytin a (ug)	20.7	10.3	14.6	17.3	0.109

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1829615-12				
	Description	Water				
	Sampled Date	08-SEP-16				
	Sampled Time	16:40				
	Client ID	R-6				
Grouping	**Analyte**					
BIOTA						
Plant Pigments	Chlorophyll a (ug)	18.3				
	Pheophytin a (ug)	14.4				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1829615-1 Water 06-SEP-16 14:30 E-1	L1829615-2 Water 07-SEP-16 09:40 PORCUPINE CR	L1829615-3 Water 06-SEP-16 16:30 E-2	L1829615-4 Water 06-SEP-16 09:00 E-3	L1829615-5 Water 05-SEP-16 13:10 E-4
WATER						
Physical Tests	Conductivity (uS/cm)	531	1980	664	622	708
	Hardness (as CaCO3) (mg/L)	281	1370	370	337	386
	pH (pH)	8.20	8.38	8.11	8.15	8.14
Anions and Nutrients	Sulfate (SO4) (mg/L)	151	1090	219	191	236
Total Metals	Aluminum (Al)-Total (mg/L)	0.0656	0.0051	0.0516	1.23	0.185
	Antimony (Sb)-Total (mg/L)	<0.00050	0.00148	<0.00050	0.00066	<0.00050
	Arsenic (As)-Total (mg/L)	0.00090	0.00239	0.00109	0.00198	0.00135
	Barium (Ba)-Total (mg/L)	0.071	0.026	0.066	0.107	0.067
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	0.23	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	0.0000453	0.000162	0.0000474	0.000186	0.0000621
	Calcium (Ca)-Total (mg/L)	68.1	187	78.3	65.0	76.0
	Chromium (Cr)-Total (mg/L)	<0.0010	0.0024	<0.0010	0.0032	0.0011
	Cobalt (Co)-Total (mg/L)	0.00049	<0.00030	0.00064	0.00164	0.00085
	Copper (Cu)-Total (mg/L)	0.0030	0.0020	0.0026	0.0062	0.0028
	Iron (Fe)-Total (mg/L)	0.323	<0.030	0.349	2.67	0.645
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00141	<0.00050
	Lithium (Li)-Total (mg/L)	0.0028	0.0645	0.0074	0.0045	0.0095
	Magnesium (Mg)-Total (mg/L)	28.0	209	42.9	42.0	46.2
	Manganese (Mn)-Total (mg/L)	0.182	0.00134	0.166	0.226	0.193
	Mercury (Hg)-Total (mg/L)	0.0000057	0.0000051	0.0000062	0.0000189	0.0000068
	Molybdenum (Mo)-Total (mg/L)	0.0013	0.0026	0.0015	0.0017	0.0016
	Nickel (Ni)-Total (mg/L)	0.0046	0.0573	0.0110	0.0093	0.0134
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	2.6	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	0.00188	0.00501	0.00194	0.00167	0.00179
	Silicon (Si)-Total (mg/L)	5.13	6.10	5.05	7.74	5.26
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	0.000053	<0.000020
	Sodium (Na)-Total (mg/L)	2.9	13.7	3.7	4.9	4.2
	Strontium (Sr)-Total (mg/L)	0.304	1.62	0.418	0.327	0.426
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	0.030	<0.010
	Uranium (U)-Total (mg/L)	0.00185	0.00530	0.00207	0.00248	0.00223
	Vanadium (V)-Total (mg/L)	0.00069	<0.00050	0.00067	0.00430	0.00105
	Zinc (Zn)-Total (mg/L)	<0.0050	0.0067	<0.0050	0.0147	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1829615-6	L1829615-7	L1829615-8	L1829615-9	L1829615-10
Description	Water	Water	Water	Water	Water
Sampled Date	05-SEP-16	08-SEP-16	07-SEP-16	07-SEP-16	06-SEP-16
Sampled Time	09:30	14:50	12:45	15:00	11:30
Client ID	E-6	E-8	R-1	R-2	R-3
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	716	250	700	618	682
Hardness (as CaCO3) (mg/L)	385	116	375	328	367
pH (pH)	8.20	8.06	8.21	8.25	8.17
Anions and Nutrients Sulfate (SO4) (mg/L)	235	47.9	224	169	218
Total Metals Aluminum (Al)-Total (mg/L)	0.549	0.281	0.819	0.316	0.345
Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total (mg/L)	0.00195	0.00079	0.00148	0.00132	0.00101
Barium (Ba)-Total (mg/L)	0.089	0.048	0.081	0.062	0.080
Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Total (mg/L)	0.000104	0.0000339	0.000174	0.0000351	0.0000320
Calcium (Ca)-Total (mg/L)	78.0	31.2	93.6	61.9	71.2
Chromium (Cr)-Total (mg/L)	0.0023	<0.0010	0.0018	0.0013	0.0013
Cobalt (Co)-Total (mg/L)	0.00166	0.00073	0.00142	0.00054	0.00076
Copper (Cu)-Total (mg/L)	0.0042	0.0031	0.0041	0.0021	0.0027
Iron (Fe)-Total (mg/L)	1.40	0.634	1.73	1.01	1.01
Lead (Pb)-Total (mg/L)	0.00077	<0.00050	0.00132	<0.00050	<0.00050
Lithium (Li)-Total (mg/L)	0.0088	0.0035	0.0039	0.0058	0.0033
Magnesium (Mg)-Total (mg/L)	45.0	9.51	34.5	42.2	45.5
Manganese (Mn)-Total (mg/L)	0.378	0.0625	0.400	0.143	0.280
Mercury (Hg)-Total (mg/L)	0.0000114	<0.0000050	0.0000128	0.0000052	0.0000056
Molybdenum (Mo)-Total (mg/L)	0.0016	<0.0010	0.0015	<0.0010	0.0013
Nickel (Ni)-Total (mg/L)	0.0164	0.0038	0.0065	0.0047	0.0044
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Total (mg/L)	0.00190	0.000317	0.00298	0.000780	0.000985
Silicon (Si)-Total (mg/L)	6.02	5.82	6.02	6.36	6.61
Silver (Ag)-Total (mg/L)	0.000033	<0.000020	0.000031	<0.000020	<0.000020
Sodium (Na)-Total (mg/L)	4.2	3.7	3.5	3.2	4.4
Strontium (Sr)-Total (mg/L)	0.433	0.158	0.425	0.328	0.347
Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Total (mg/L)	0.021	<0.010	0.032	0.012	0.011
Uranium (U)-Total (mg/L)	0.00242	0.00100	0.00253	0.00350	0.00319
Vanadium (V)-Total (mg/L)	0.00227	0.00151	0.00255	0.00164	0.00172
Zinc (Zn)-Total (mg/L)	0.0147	0.0054	0.0138	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1829615-11	L1829615-12	L1829615-13	L1829615-14	L1829615-15
Description	Water	Water	Water	Water	Water
Sampled Date	05-SEP-16	08-SEP-16	08-SEP-16		
Sampled Time	11:40	16:40	12:00		
Client ID	R-4	R-6	MAIDEN CR	FIELD BLANK	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	610	243	196	<2.0	<2.0
Hardness (as CaCO3) (mg/L)	324	111	84.0	<0.50	
pH (pH)	8.26	8.06	7.15	5.57	5.53
Anions and Nutrients Sulfate (SO4) (mg/L)	159	45.9	53.5	<0.30	<0.30
Total Metals Aluminum (Al)-Total (mg/L)	2.22	0.334	2.21	<0.0050	
Antimony (Sb)-Total (mg/L)	0.00067	<0.00050	<0.00050	<0.00050	
Arsenic (As)-Total (mg/L)	0.00493	0.00078	0.00210	<0.00050	
Barium (Ba)-Total (mg/L)	0.183	0.052	0.104	<0.020	
Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	
Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
Cadmium (Cd)-Total (mg/L)	0.000365	0.0000315	0.000186	<0.0000050	
Calcium (Ca)-Total (mg/L)	84.1	32.3	17.2	<0.10	
Chromium (Cr)-Total (mg/L)	0.0052	<0.0010	0.0039	<0.0010	
Cobalt (Co)-Total (mg/L)	0.00376	0.00078	0.00272	<0.00030	
Copper (Cu)-Total (mg/L)	0.0123	0.0033	0.0081	<0.0010	
Iron (Fe)-Total (mg/L)	4.98	0.762	3.38	<0.030	
Lead (Pb)-Total (mg/L)	0.00330	<0.00050	0.00189	<0.00050	
Lithium (Li)-Total (mg/L)	0.0040	0.0031	0.0021	<0.0010	
Magnesium (Mg)-Total (mg/L)	33.4	10.0	12.1	<0.10	
Manganese (Mn)-Total (mg/L)	0.433	0.0676	0.252	<0.00010	
Mercury (Hg)-Total (mg/L)	0.000064 DLM	<0.0000050	0.0000108	<0.0000050	
Molybdenum (Mo)-Total (mg/L)	0.0024	<0.0010	<0.0010	<0.0010	
Nickel (Ni)-Total (mg/L)	0.0242	0.0040	0.0087	<0.0010	
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	
Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	
Selenium (Se)-Total (mg/L)	0.00363	0.000280	0.000582	<0.000050	
Silicon (Si)-Total (mg/L)	8.86	6.35	8.56	<0.050	
Silver (Ag)-Total (mg/L)	0.000169	<0.000020	0.000036	<0.000020	
Sodium (Na)-Total (mg/L)	4.5	3.9	2.4	<2.0	
Strontium (Sr)-Total (mg/L)	0.439	0.166	0.0852	<0.0050	
Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
Titanium (Ti)-Total (mg/L)	0.058	0.011	0.066	<0.010	
Uranium (U)-Total (mg/L)	0.00353	0.00099	0.00067	<0.00020	
Vanadium (V)-Total (mg/L)	0.00774	0.00169	0.00631	<0.00050	
Zinc (Zn)-Total (mg/L)	0.0245	0.0057	0.0214	<0.0050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1829615-16				
	Description	Water				
	Sampled Date	06-SEP-16				
	Sampled Time					
	Client ID	DUPLICATE				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	684				
	Hardness (as CaCO3) (mg/L)	366				
	pH (pH)	8.09				
Anions and Nutrients	Sulfate (SO4) (mg/L)	219				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0525				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	0.00115				
	Barium (Ba)-Total (mg/L)	0.066				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Bismuth (Bi)-Total (mg/L)	<0.20				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	0.0000521				
	Calcium (Ca)-Total (mg/L)	80.1				
	Chromium (Cr)-Total (mg/L)	<0.0010				
	Cobalt (Co)-Total (mg/L)	0.00067				
	Copper (Cu)-Total (mg/L)	0.0026				
	Iron (Fe)-Total (mg/L)	0.355				
	Lead (Pb)-Total (mg/L)	<0.00050				
	Lithium (Li)-Total (mg/L)	0.0073				
	Magnesium (Mg)-Total (mg/L)	43.9				
	Manganese (Mn)-Total (mg/L)	0.179				
	Mercury (Hg)-Total (mg/L)	0.0000058				
	Molybdenum (Mo)-Total (mg/L)	0.0014				
	Nickel (Ni)-Total (mg/L)	0.0115				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	0.00184				
	Silicon (Si)-Total (mg/L)	5.13				
	Silver (Ag)-Total (mg/L)	<0.000020				
	Sodium (Na)-Total (mg/L)	3.5				
	Strontium (Sr)-Total (mg/L)	0.412				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	0.00198				
	Vanadium (V)-Total (mg/L)	0.00071				
	Zinc (Zn)-Total (mg/L)	<0.0050				

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1829615-1 Water 06-SEP-16 14:30 E-1	L1829615-2 Water 07-SEP-16 09:40 PORCUPINE CR	L1829615-3 Water 06-SEP-16 16:30 E-2	L1829615-4 Water 06-SEP-16 09:00 E-3	L1829615-5 Water 05-SEP-16 13:10 E-4
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0432	<0.0050	0.0348	0.0303	0.0294
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	0.00148	<0.00050	0.00054	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00078	0.00255	0.00105	0.00085	0.00108
	Barium (Ba)-Dissolved (mg/L)	0.065	0.025	0.059	0.063	0.058
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	0.22	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.0000391	0.000181	0.0000500	0.0000248	0.0000419
	Calcium (Ca)-Dissolved (mg/L)	64.4	185	74.9	60.8	73.9
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	0.0024	<0.0010	0.0051	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.00043	<0.00030	0.00061	0.00051	0.00066
	Copper (Cu)-Dissolved (mg/L)	0.0027	0.0011	0.0024	0.0018	0.0021
	Iron (Fe)-Dissolved (mg/L)	0.246	<0.030	0.268	0.280	0.284
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	0.0028	0.0629	0.0073	0.0035	0.0091
	Magnesium (Mg)-Dissolved (mg/L)	29.3	221	44.5	44.9	49.0
	Manganese (Mn)-Dissolved (mg/L)	0.164	0.00116	0.160	0.170	0.174
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.0012	0.0024	0.0014	0.0012	0.0014
	Nickel (Ni)-Dissolved (mg/L)	0.0044	0.0594	0.0107	0.0080	0.0117
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	2.8	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	0.00192	0.00514	0.00198	0.00146	0.00196
	Silicon (Si)-Dissolved (mg/L)	4.88	6.08	4.86	5.77	4.93
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	2.3	14.0	2.9	4.0	3.5
	Strontium (Sr)-Dissolved (mg/L)	0.278	1.65	0.373	0.284	0.389
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00178	0.00526	0.00196	0.00236	0.00207
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00055	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0063	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1829615-6 Water 05-SEP-16 09:30 E-6	L1829615-7 Water 08-SEP-16 14:50 E-8	L1829615-8 Water 07-SEP-16 12:45 R-1	L1829615-9 Water 07-SEP-16 15:00 R-2	L1829615-10 Water 06-SEP-16 11:30 R-3
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0286	0.0922	0.0289	0.0406	0.0298
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00123	0.00060	0.00057	0.00108	0.00067
	Barium (Ba)-Dissolved (mg/L)	0.068	0.043	0.057	0.052	0.064
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.0000492	0.0000256	0.0000749	0.0000271	0.0000190
	Calcium (Ca)-Dissolved (mg/L)	74.7	30.8	90.2	59.4	69.5
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.00111	0.00056	0.00071	0.00034	0.00052
	Copper (Cu)-Dissolved (mg/L)	0.0022	0.0027	0.0019	0.0016	0.0018
	Iron (Fe)-Dissolved (mg/L)	0.323	0.300	0.269	0.519	0.365
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	0.0087	0.0036	0.0028	0.0057	0.0027
	Magnesium (Mg)-Dissolved (mg/L)	48.3	9.40	36.4	43.6	46.9
	Manganese (Mn)-Dissolved (mg/L)	0.351	0.0544	0.331	0.130	0.261
	Mercury (Hg)-Dissolved (mg/L)	0.0000051	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.0014	<0.0010	0.0012	<0.0010	0.0011
	Nickel (Ni)-Dissolved (mg/L)	0.0131	0.0034	0.0042	0.0041	0.0037
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	0.00186	0.000295	0.00291	0.000725	0.000994
	Silicon (Si)-Dissolved (mg/L)	4.98	5.54	4.71	5.82	6.00
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	3.4	3.0	2.6	2.4	3.6
	Strontium (Sr)-Dissolved (mg/L)	0.383	0.143	0.374	0.293	0.311
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00231	0.00098	0.00226	0.00341	0.00302
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00079	<0.00050	0.00066	0.00060
	Zinc (Zn)-Dissolved (mg/L)	0.0062	<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1829615-11	L1829615-12	L1829615-13	L1829615-14	L1829615-15
Description	Water	Water	Water	Water	Water
Sampled Date	05-SEP-16	08-SEP-16	08-SEP-16		
Sampled Time	11:40	16:40	12:00		
Client ID	R-4	R-6	MAIDEN CR	FIELD BLANK	TRAVEL BLANK
Grouping **Analyte**					
WATER					
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	
Aluminum (Al)-Dissolved (mg/L)	0.0199	0.0846	0.172	<0.0050	
Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
Arsenic (As)-Dissolved (mg/L)	0.00207	0.00059	0.00076	<0.00050	
Barium (Ba)-Dissolved (mg/L)	0.090	0.041	0.049	<0.020	
Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	
Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	
Cadmium (Cd)-Dissolved (mg/L)	0.0000464	0.0000227	0.0000397	<0.0000050	
Calcium (Ca)-Dissolved (mg/L)	76.7	29.3	15.6	<0.10	
Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
Cobalt (Co)-Dissolved (mg/L)	0.00123	0.00055	0.00126	<0.00030	
Copper (Cu)-Dissolved (mg/L)	0.0019	0.0026	0.0039	<0.0010	
Iron (Fe)-Dissolved (mg/L)	0.159	0.306	0.516	<0.030	
Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
Lithium (Li)-Dissolved (mg/L)	0.0020	0.0032	<0.0010	<0.0010	
Magnesium (Mg)-Dissolved (mg/L)	32.1	9.09	10.9	<0.10	
Manganese (Mn)-Dissolved (mg/L)	0.299	0.0508	0.188	<0.00010	
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	0.0000059	<0.0000050	
Molybdenum (Mo)-Dissolved (mg/L)	0.0013	<0.0010	<0.0010	<0.0010	
Nickel (Ni)-Dissolved (mg/L)	0.0117	0.0032	0.0050	<0.0010	
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
Selenium (Se)-Dissolved (mg/L)	0.00324	0.000257	0.000574	<0.000050	
Silicon (Si)-Dissolved (mg/L)	5.44	5.56	5.74	<0.050	
Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
Sodium (Na)-Dissolved (mg/L)	3.6	3.0	<2.0	<2.0	
Strontium (Sr)-Dissolved (mg/L)	0.371	0.140	0.0714	<0.0050	
Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved (mg/L)	0.00314	0.00087	0.00042	<0.00020	
Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00080	0.00078	<0.00050	
Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1829615-16
	Description	Water
	Sampled Date	06-SEP-16
	Sampled Time	
	Client ID	DUPLICATE
Grouping	**Analyte**	
WATER		
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD
	Dissolved Metals Filtration Location	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0370
	Antimony (Sb)-Dissolved (mg/L)	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00106
	Barium (Ba)-Dissolved (mg/L)	0.058
	Beryllium (Be)-Dissolved (mg/L)	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.0000497
	Calcium (Ca)-Dissolved (mg/L)	73.2
	Chromium (Cr)-Dissolved (mg/L)	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.00063
	Copper (Cu)-Dissolved (mg/L)	0.0024
	Iron (Fe)-Dissolved (mg/L)	0.256
	Lead (Pb)-Dissolved (mg/L)	<0.00050
	Lithium (Li)-Dissolved (mg/L)	0.0072
	Magnesium (Mg)-Dissolved (mg/L)	44.5
	Manganese (Mn)-Dissolved (mg/L)	0.166
	Mercury (Hg)-Dissolved (mg/L)	0.0000051
	Molybdenum (Mo)-Dissolved (mg/L)	0.0014
	Nickel (Ni)-Dissolved (mg/L)	0.0110
	Phosphorus (P)-Dissolved (mg/L)	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0
	Selenium (Se)-Dissolved (mg/L)	0.00195
	Silicon (Si)-Dissolved (mg/L)	4.75
	Silver (Ag)-Dissolved (mg/L)	<0.000020
	Sodium (Na)-Dissolved (mg/L)	2.8
	Strontium (Sr)-Dissolved (mg/L)	0.368
	Thallium (Tl)-Dissolved (mg/L)	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00199
	Vanadium (V)-Dissolved (mg/L)	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Antimony (Sb)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Aluminum (Al)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Manganese (Mn)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Calcium (Ca)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Iron (Fe)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Iron (Fe)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Silicon (Si)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Silicon (Si)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sulfate (SO4)	MS-B	L1829615-2
Matrix Spike	Sulfate (SO4)	MS-B	L1829615-2

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AREA SAMPLED-VA	Biota	Area Sampled (cm2)	Not Applicable

Reference Information

CHLOROA-F-VA Biota Chlorophyll a in Biota by Fluorometer EPA 445.0

This analysis is done using procedures adapted from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b. Note: Biota samples are typically submitted as scrapings on a filter.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA Water Total Mercury in Water by CVAAS or CVAFS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PHEOPHYTIN-F-VA Biota Pheophytin a in Biota by Fluorometer EPA 445.0

This analysis is done using procedures modified from EPA 445.0 . Pheopigments present in a biota sample are determined collectively as pheophytin a. Pheophytin a is determined by a routine acetone extraction followed with analysis by flourometry using the acidification procedure.
Note: Biota samples are typically submitted as scrapings on a filter.

Reference Information

SO4-IC-N-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

14-470932, 14-470930

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

23-Sep-2016

Brent Mack
ALS Environmental
8081 Lougheed HWY
Suite 100
Burnaby, BC V5A1W9

Tel: (604) 253-4188
Fax:

Re: L1829615 Work Order: **1609561**

Dear Brent,

ALS Environmental received 16 samples on 20-Sep-2016 10:35 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 22.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Chris Gibson

Shawn Smythe
Project Manager

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Project: L1829615
Work Order: **1609561**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1609561-01	L1829615-1	Water		9/6/2016	9/20/2016 10:35	☐
1609561-02	L1829615-2	Water		9/7/2016	9/20/2016 10:35	☐
1609561-03	L1829615-3	Water		9/6/2016	9/20/2016 10:35	☐
1609561-04	L1829615-4	Water		9/6/2016	9/20/2016 10:35	☐
1609561-05	L1829615-5	Water		9/5/2016	9/20/2016 10:35	☐
1609561-06	L1829615-6	Water		9/5/2016	9/20/2016 10:35	☐
1609561-07	L1829615-7	Water		9/8/2016	9/20/2016 10:35	☐
1609561-08	L1829615-8	Water		9/7/2016	9/20/2016 10:35	☐
1609561-09	L1829615-9	Water		9/7/2016	9/20/2016 10:35	☐
1609561-10	L1829615-10	Water		9/6/2016	9/20/2016 10:35	☐
1609561-11	L1829615-11	Water		9/5/2016	9/20/2016 10:35	☐
1609561-12	L1829615-12	Water		9/8/2016	9/20/2016 10:35	☐
1609561-13	L1829615-13	Water		9/8/2016	9/20/2016 10:35	☐
1609561-14	L1829615-14	Water			9/20/2016 10:35	☐
1609561-15	L1829615-15	Water			9/20/2016 10:35	☐
1609561-16	L1829615-16	Water			9/20/2016 10:35	☐

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Project: L1829615
Work Order: 1609561

Case Narrative

The sample condition upon receipt was acceptable except where noted.

Results relate only to the items tested and are not blank corrected unless indicated.

Compound identification is based upon retention time matching only. Any compound with a similar retention time will interfere.

Samples were prepared and analyzed by the analytical method and the laboratory's applicable standard operating procedure listed below:
- IH-001- "Determination of Analytes Using NIOSH and OSHA Methods Using Gas Chromatography."
- IH-002- "Determination of Suspended Particulates in the Atmosphere Using Various Media"
- IH-003- "Determination of Suspended Particulates Not Otherwise Regulated (Total and Respirable)."
- IH-004- "Determination of Analytes by NIOSH and OSHA Methods Using Liquid Chromatography."
- IH-005- "Benzene-Soluble Fraction and Total Particulate (Asphalt Fume)."
- IH-006- "Methods IO-3.1 and IO-3.4 Modified for Metals Preparation and Analysis for Suspended Particulates."
- IH-196- "Carbon Black by OSHA 196."
- IH-6009- "Determination of Mercury in Industrial Hygiene Samples by Manual Cold Vapor Atomic Absorption Spectroscopy."
- ENV-6010B- "Determination of Trace Metals in Solution by Inductively Coupled Plasma-Atomic Emission Spectroscopy by EPA Method 6010B Non-VAP."
- IH-7300 modified- "Elements by ICP."

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-1	**Lab ID:**	1609561-01
Collection Date:	9/6/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**2.4**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-2	**Lab ID:**	1609561-02
Collection Date:	9/7/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**2.4**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-3	**Lab ID:**	1609561-03
Collection Date:	9/6/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**2.2**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-4	**Lab ID:**	1609561-04
Collection Date:	9/6/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**63**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-5	**Lab ID:**	1609561-05
Collection Date:	9/5/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**4.9**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-6	**Lab ID:**	1609561-06
Collection Date:	9/5/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**32**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-7	**Lab ID:**	1609561-07
Collection Date:	9/8/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**7.7**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-8	**Lab ID:**	1609561-08
Collection Date:	9/7/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**37**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-9	**Lab ID:**	1609561-09
Collection Date:	9/7/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**9.8**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-10	**Lab ID:**	1609561-10
Collection Date:	9/6/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**12**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-11	**Lab ID:**	1609561-11
Collection Date:	9/5/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**130**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-12	**Lab ID:**	1609561-12
Collection Date:	9/8/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**4.9**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-13	**Lab ID:**	1609561-13
Collection Date:	9/8/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**98**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client: ALS Environmental
Project: L1829615 **Work Order:** 1609561
Sample ID: L1829615-14 **Lab ID:** 1609561-14
Collection Date: **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**2.6**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-15	**Lab ID:**	1609561-15
Collection Date:		**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	**2.0**		**2.0**	**mg/L**	1	9/20/2016

Note:

ALS Environmental

Date: *23-Sep-16*

Client:	ALS Environmental		
Project:	L1829615	**Work Order:**	1609561
Sample ID:	L1829615-16	**Lab ID:**	1609561-16
Collection Date:		**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			**E160.2**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Work Order: 1609561

Project: L1829615

QC BATCH REPORT

Batch ID: **R133102** Instrument ID **WETCHEM** Method: **E160.2**

MBLK Sample ID: **MB-R133102-R133102** Units: **mg/L** Analysis Date: **9/20/2016**

Client ID: Run ID: **WETCHEM_160920C** SeqNo: **1360373** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	2.0								

LCS Sample ID: **LCS-R133102-R133102** Units: **mg/L** Analysis Date: **9/20/2016**

Client ID: Run ID: **WETCHEM_160920C** SeqNo: **1360374** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	942.1	2.0	1000	0	94.2	70-130	0			

DUP Sample ID: **1609561-02A Dup** Units: **mg/L** Analysis Date: **9/20/2016**

Client ID: **L1829615-2** Run ID: **WETCHEM_160920C** SeqNo: **1360378** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	2.91	2.0	0	0	0		2.39	19.6		

DUP Sample ID: **1609561-16A Dup** Units: **mg/L** Analysis Date: **9/20/2016**

Client ID: **L1829615-16** Run ID: **WETCHEM_160920C** SeqNo: **1360393** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	2.0	0	0	0		1.6	0		

The following samples were analyzed in this batch:

1609561-01A	1609561-02A	1609561-03A
1609561-04A	1609561-05A	1609561-06A
1609561-07A	1609561-08A	1609561-09A
1609561-10A	1609561-11A	1609561-12A
1609561-13A	1609561-14A	1609561-15A
1609561-16A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Project: L1829615
WorkOrder: **1609561**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
mg/L	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-VANCOUVER** Date/Time Received: **20-Sep-16 10:35**

Work Order: **1609561** Received by: **RDN**

Checklist completed by Stephanie Harrington 20-Sep-16 Reviewed by: Shawn Smythe 21-Sep-16

eSignature Date eSignature Date

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.2		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Short Holding Time

o Rush Processing

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1829615-COFC

COC Number: 14 - 470932

Page 1 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Laberge Environmental Services	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Bonnie Burns	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	P.O. Box 21072, Whitehorse YT Y1A6P7	☑ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	867-668-6838	Email 1 or Fax	bonnie burns e northwestel.net	Specify Date Required for E2,E or P:
		Email 2		Analysis Request

Invoice To		Invoice Distribution	
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax	bonnie burns e northwestel.net
Company:	Same as above	Email 2	
Contact:		Oil and Gas Required Fields (client use)	

Project Information			
ALS Quote #:	14 16 12 DN	Approver ID:	Cost Center:
Job #:	Clinton Creek	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)	L1829615	ALS Contact:	Sampler: B. Burns

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total metals Low level	Dissolved metals low level	Total Mercury	Dissolved Mercury	General, TSS etc	Sat etc	Chlorophyll a + Phaeophytin							Number of Containers
1	E-1	8/9/16	14:30	H2O	✓	✓	✓	✓	✓	✓	✓	✓						7
2	Porcupine Cr	7/9/16	9:40	"	✓	✓	✓	✓	✓	✓	✓	✓						7
3	E-2	6/9/16	16:30	"	✓	✓	✓	✓	✓	✓	✓	✓						7
4	E-3	6/9/16	09:00	"	✓	✓	✓	✓	✓	✓	✓	✓						7
5	E-4	5/9/16	13:10	"	✓	✓	✓	✓	✓	✓	✓	✓						7
6	E-6	5/9/16	9:30	"	✓	✓	✓	✓	✓	✓	✓	✓						7
7	E-8	8/9/16	14:50	"	✓	✓	✓	✓	✓	✓	✓	✓						7
8	R-1	7/9/16	12:45	"	✓	✓	✓	✓	✓	✓								5
9	R-2	7/9/16	15:00	"	✓	✓	✓	✓	✓	✓	✓	✓						7
10	R-3	6/9/16	11:30	"	✓	✓	✓	✓	✓	✓	✓	✓						7
11	R-4	5/9/16	14:40	"	✓	✓	✓	✓	✓	✓	✓	✓						7
12	R-6	8/9/16	16:40	"	✓	✓	✓	✓	✓	✓	✓	✓						7

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	to meet CCME freshwater aquatic life criteria. Lab samples preserved & filtered as necessary
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☑	No ☐	Custody seal intact	Yes ☑	No ☐
Cooling Initiated	☑				

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C		
4.4	2.2			6

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Bonnie Burns	Sept 9/16			12-SEP-16	9:15	HMC		10:55

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS FM-03256 v09 Front/BH January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

SEP 13 2016

Short Holding Time

O **Rush Processing**

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1829615-COFC

COC Number: 14 - 470930

Report To	
Company:	Laberge Env. Serv.
Contact:	
Address:	
Phone:	867-668-6838

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ Yes ☐ No

☑ Criteria on Report - provide details below if box checked

Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: bonnieburns@northwestel.net

Email 2

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)

- R ☐ Regular (Standard TAT if received by 3pm)
- P ☐ Priority (2-4 business days if received by 3pm)
- E ☐ Emergency (1-2 business days if received by 3pm)
- E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.

Specify Date Required for E2,E or P:

Invoice To		
Same as Report To	☐ Yes	☐ No
Copy of Invoice with Report	☐ Yes	☐ No
Company:		
Contact:		

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: bonnieburns@northwestel.net

Email 2

Project Information

ALS Quote #:	141612DN
Job #:	Clinton Cr
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

Approver ID:		Cost Center:	
GL Account:		Routing Code:	
Activity Code:			
Location:			
ALS Contact:		Sampler:	

ALS Lab Work Order # (lab use only): L1829615

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total metals - low level	Dissolved metals low level	Total Mercury	Dissolved Mercury	General, TSS etc	SO4 etc.	Number of Containers
13	Maiden Cr	8/9/16		H_2O	✓	✓	✓	✓	✓	✓	5
14	Field Blank			"	✓	✓	✓	✓	✓	✓	5
15	Travel blank			"	✗	✗	✗	✗	✓	✓	5
16	Duplicate	8/9/16		"	✓	✓	✓	✓	✓	✓	5

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☐ No

Are samples for human drinking water use? ☐ Yes ☐ No

Special Instructions / Specify Criteria to add on report (client Use)

note there wasn't travel blanks for metals or Hg.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☑ No ☐ Custody seal intact Yes ☑ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C: 4.4, 2.2

FINAL COOLER TEMPERATURES °C: 6

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Bonnie Burns	Date: Sept 9/16	Time:	Received by: [signature]	Date: 12-SEP-16	Time: 9:15	Received by: HMC	Date: SEP 13 2016	Time: 10.55

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.