

July 10, 2013

EDI Job Number: 13-Y-0167

Assessment and Abandoned Mines Branch (AAM) K-149
Department of Energy, Mines and Resources, Yukon Government
Room 2C Royal Center, 4114-4th Avenue
PO 2703, Whitehorse, YT, Y1A 2C6

Attention: Adrienne Turcotte, Mount Nansen Project Officer

Re: Mount Nansen Surface Water Quality Field Memo: June 24-26, 2013

Trip Dates:	June 24-26, 2013
EDI Field Staff:	Joel MacFabe, Meghan Marjanovic, Danny Skookum
Tasks:	Hydrology and Water Quality

Field Summary

EDI completed the surface water quality sampling and hydrometric monitoring at the Mount Nansen Site from June 24 to June 26, 2013. Air temperatures during the trip ranged from 15 °C to 28 °C. Weather conditions were primarily sunny with periods of cloud.

EDI visited all water quality sites and hydrometric stations. Water levels across all of the sites/stations were low to moderate and typical of this time of year. Most of the ice from the Dome Creek valley has melted, however there are a few persistent ice patches in the H/WQ-DC-D1b area.

Each section below details additional site- and station-specific information for the Hydrology (Section 1) and Water Quality (Section 2) programs. Included in the Water Quality section is an appendix of water quality parameters that exceeded guidelines and/or the Mount Nansen Effluent Quality Standards from the previous sampling trip (June 10-12, 2013) as well as the ALS laboratory and Yukon Government (YG) Environmental Health Services analysis reports. Section 3 contains relevant photos of field conditions. Section 4 details additional monitoring program comments, noteworthy observations, and any changes to budget or scope moving forward.

Note the seepage pond was sampled at the request of AAM on July 3, 2013 as a separate trip (over one day).



1. Hydrology

Stream discharge measurements were collected using the cross-sectional velocity-area method, alternatively termed the 'mid-section method'. Point velocities were collected at 60% of the stream depth in discretized 'panels' along a stream cross section. Each panel and point velocity measurement is selected such that each panel represents less than 10% of total stream discharge. Where channel conditions did not permit the use of the cross sectional area, salt tracer methods were used. Salt solutions of varying concentrations were slug-injected into the stream with specific conductivity measured at a point downstream. Changes in stream water specific conductivity and conservation of mass is used to estimate stream discharge.

All hydrometric stations were visited and site conditions documented. Table 1 summarizes the hydrometric monitoring program station measurements completed and any additional relevant station details. The data loggers' at all continuous stations were downloaded and re-deployed following hydrometric monitoring. Site conditions at most stations are consistent with the seasonal drop in stage levels in early summer. All stations were deployed on previous visits to the site.

Table 1. Hydrometric program details.

Hydrology program dates:		June 24-25, 2013
Weather at time of monitoring:		Weather conditions were sunny with cloudy periods, with temperatures between 15°C to 28°C.
Station	Hydrometric Measurement Type	Notes & Comments
ATM-DC2/DC4	None	Both atmospheric barologgers downloaded.
H-DC-DX	Volumetric	Water flowing in very small channel. Volumetric measurement collected from culvert outlet downstream.
H-DC-DX+105	Salt Slug	Salt tracer method used to measure stream discharge.
H-DC-D1b	Salt Slug	Flow levels were moderate to high (Photo 2). Most of ice had melted from ponded area upstream, with a small patch remaining in vegetation along creek. Salt tracer discharge measurement taken.
H-DC-U1	Salt Slug	Salt tracer method used to estimate discharge. Visually low stage in well-defined channel.
H-DC-U2	Salt Slug	Salt tracer method used to estimate discharge through existing channel. Channel flow levels low to moderate with moderate to high turbidity (Photo 3).
H-DC-B	Salt Slug	Salt tracer method used to estimate stream discharge. Logger downloaded and re-deployed.
H-DC-M	Salt Slug	Moderate flow levels observed. Salt tracer used to estimate stream discharge. Logger downloaded and re-deployed.
H-DC-R	Salt Slug	Moderate flow levels observed with high turbidity. Salt tracer used to estimate stream discharge. Logger downloaded and re-deployed.



Station	Hydrometric Measurement Type	Notes & Comments
H-VC-REF	ADV	Flow levels low with moderate levels of turbidity. No silting within stilling well. Area-velocity method used to estimate discharge. Logger downloaded and re-deployed.
H-VC-U	ADV	Water levels are low with moderate levels of turbidity. Discharge measurement completed using the mid-section method. Logger downloaded and re-deployed.
H-BC	Salt Slug	Station stage levels low with clear water (Photo 7). Salt tracer used to measure discharge. No silting within stilling well. Logger downloaded and re-deployed. Juvenile Arctic grayling observed within channel.
H-VC-DBC	ADV	Stream channel conditions unchanged from previous visit. Water level stage is low with moderate turbidity. Mid-section method used to measure discharge. Logger downloaded and re-deployed.
H-VC-UMN	ADV	Channel conditions unchanged from previous visit, with flows low and moderately turbid. Mid-section method used to measure discharge. Logger downloaded and re-deployed.
H-MN	Salt Slug	Low water level stage (Photo 8). Salt tracer was used to measure discharge. Logger downloaded and re-deployed. Minor station maintenance completed.
H-VC-R	ADV	Stream flows low with moderate to high turbidity levels (Photo 9). Mid-section method used to estimate discharge. Logger downloaded and re-deployed.
H-SEEP	Volumetric	A volumetric measurement was made at the pipe discharge. Flow rate and total volume was recorded from the flow meter. Staff gauge reading was recorded.
H-TP	None	Staff gauge reading recorded (Photo 4).
H-PC-U	Salt Slug	Water level flows low, with no water flowing over the weir structure. All flow was seeping around edges and under of weir. No flow was bypassing upstream of the berm. Salt tracer was used to measure discharge. Logger downloaded and re-deployed.
H-PC-DSP	Volumetric	Flow level is low. A volumetric measurement was collected from the culvert upstream of the station. Logger downloaded and re-deployed.



2. Water Quality

Water quality samples were collected from all monitoring stations with the exception of WQ-MS-S-08 and WQ-ADIT-SEEP. No water was observed at the WQ-MS-S-08 location and therefore this site could not be sampled (Photo 1). Similarly, no water was observed flowing from the adit seep at the time of sampling, nor from the culvert just upstream of the WQ-PC-D site, where water was flowing underground and emerging at the regular sampling location (Photo 10). These observations are consistent with the regionally dry and hot weather, low stream discharges.

All water quality samples were delivered to ALS on Wednesday, June 26, 2013. Bacteriological samples collected from the pump house well were submitted to YG Environmental Health Services on Wednesday, June 26, 2013.

This report includes analytical results from samples collected during the June 10-13, 2013 trip (Appendix A) as well as copies of the ALS Certificate of Analysis (Appendix B) and copies of the YG Environmental Health Services results (Appendix C).

Additional water quality samples were collected from the Seepage Pond on July 3, 2013 at the request of AAM. A day trip to the site was completed in order to meet laboratory sample hold times. Samples were collected and submitted within the same day. The purpose of this sampling was to determine the water quality and ensure compliance with guidelines/standards prior to emptying the pond and discharging it into Dome Creek. One sample was collected from the surface and another from a depth of 1.75 m. The total depth of the pond was 1.96 m. A water quality profile was also conducted at 0.25 m intervals for pH, specific conductance, water temperature, and dissolved oxygen and these results have been submitted to AAM. Lab analysis results will follow on July 10, 2013.

Table 2. Water quality sampling program details.

WQ Sampling dates:	June 25-26, 2013	
Weather at time of sampling:	Conditions ranged from 15°C to 28°C, with mostly sunny skies and light winds.	
Site	Sampled? (Yes/No)	Notes / Explanations
WQ-PIT1	No	Not required at this time.
WQ-PIT2	No	Not required at this time.
WQ-PIT3	No	Not required at this time.
WQ-SEEP	Yes	Site conditions were normal for time of year.
WQ-TP	Yes	Conditions were normal for time of year.
WQ-DC-DX	Yes	Water levels were low and turbidity was light.
WQ-DC-DX+105	Yes	Site conditions normal for time of year, water levels moderate with turbidity moderate to high.



Site	Sampled? (Yes/No)	Notes / Explanations
WQ-DC-D1b	Yes	Water levels were moderate with light turbidity (Photo 2). Ice remains over some sections of creek and in pond above berm.
WQ-DC-U1	Yes	Water levels were low and turbidity light.
WQ-DC-U2	Yes	Water levels were low and water was moderately to highly turbid (Photo 3).
WQ-DC-U	Yes	Water levels were moderate with moderate turbidity.
WQ-DC-R	Yes	Sampling location is ice-free. Water levels were moderate with moderate turbidity.
WQ-VC-REF	Yes	Site conditions normal for time of year, water levels were low with moderate to elevated turbidity.
WQ-VC-U	Yes	Site conditions normal for time of year, water levels were low with moderate to elevated turbidity (Photo 6).
WQ-BC	Yes	Site conditions normal for time of year, water levels were low with moderate turbidity (Photo 7). Arctic grayling observed swimming in channel.
WQ-VC-DBC	Yes	Site conditions normal for time of year, water levels were low with moderate turbidity.
WQ-VC-UMN	Yes	Site conditions normal for time of year, water levels were low with moderate turbidity.
WQ-MN	Yes	Site conditions normal for time of year with low water levels and moderate turbidity (Photo 8).
WQ-VC-R	Yes	Site conditions normal for time of year with low flow levels and moderate to high turbidity.
WQ-PW	Yes	Bacteriological sample collected from discharge pipe.
WQ-PC-U	Yes	Site conditions normal for time of year, low flow levels and light turbidity.
WQ-PC-D	Yes	Water levels were very low, with the creek going underground above and below the culvert, and reappearing at the regular sampling location (Photo 10).
WQ-ADIT-SEEP	No	Seep was dry.
WQ-MS-S-08	No	Seep was dry at time of sampling (Photo 1).
WQ-MS-S-03	Yes	Very low flows with high amount of orange filamentous algae.
WQ-DRY	No	Not required at this time.
WQ-SP-1	Yes	Seepage pond sample collected from surface of pond. Second-time sampling event (Photo 5) completed on July 3, 2013.
WQ-SP-2	Yes	Seepage pond sample collected from depth of 2 m. Second-time sampling event (Photo 5) completed on July 3, 2013.
Quality Assurance/Quality Control Samples		
Field Replicate A	Yes	Collected from WQ-VC-UMN.
Field Replicate B	Yes	Collected from WQ-PC-U.
Field Blank	Yes	Samples prepared with lab-supplied de-ionized water at the site.
Trip Blank	Yes	Samples provided by lab and were transported to and from site.



3. Trip Photographs



Photo 1. WQ-MS-S-08 sampling location showing dry conditions.



Photo 2. The H/WQ-DC-D1b location looking upstream.

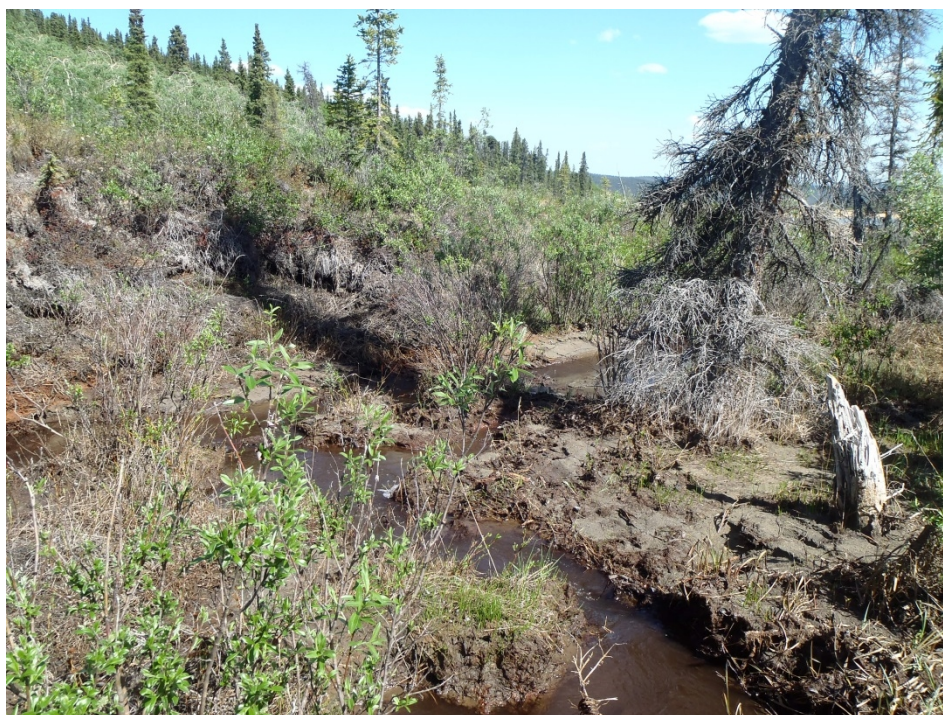


Photo 3. The H/WQ-DC-U2 location looking downstream towards tailings pond.



Photo 4. H/WQ-TP location showing staff gauge levels.



Photo 5. The WQ-SP sampling location showing conditions on seepage pond.



Photo 6. WQ-VC-U sampling location, looking downstream to Back Creek confluence.



Photo 7. H/WQ-BC location looking downstream, showing clear water and low water levels.



Photo 8. The H/WQ-MN location looking downstream.



Photo 9. Turbid conditions observed at H-VC-R during low-stage.



Photo 10. WQ-PC-D site looking upstream as creek reemerges from going underground further upstream.



4. Additional Trip Information/Comments

Any changes to project scope (i.e. additional sites sampled):	An additional sampling event of the seepage pond (WQ-SP) was conducted on July 3, 2013 at the request of AAM. This involved two water quality samples and a water quality profile at 0.25 m intervals. See potential budget implications below.
Any alterations to sample scheduling:	No alterations to the sampling schedule
Any events resulting in changes to budget:	The seepage pond sampling will result in an addition to the cost on the July invoice, reflected as additional personnel and disbursement fees (lab fees, consumables, truck rental, boat rental, and water quality kit rental). It is not expected that this additional sampling will require a scope change, however, the budget will be tracked following all July work to ensure the project remains on budget. An estimated breakdown of the costs are provided below: Personnel Hours: \$720 - 9 hours Technician Estimated Disbursements: \$1,903 - Truck Rental - \$150 - Boat Rental - \$40 - Consumables - \$30 - Water Quality Sampling Summer Kit - \$145 - Lab Fees (Estimate) - \$1,539
Additional Comments:	None
Wildlife Sightings:	Arctic grayling juveniles observed in Back Creek at WQ/H-BC.
Site concerns including safety concerns:	None



Appendix A:
Water Quality Parameter Guideline Exceedances
June 10-12, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130612-010	0167-130612-003	0167-130612-011	0167-130612-002	0167-130612-007	0167-130612-006	0167-130612-009	0167-130612-001	0167-130612-005	0167-130612-004	0167-130611-015	0167-130611-016	0167-130611-017	0167-130611-020
				WQ Site ID Date Sampled Detection Limit	WQ-DC-DXr 06/12/2013	WQ-DC-D1b 06/12/2013	WQ-DC-DX 06/12/2013	WQ-ADIT-SEEP 06/12/2013	WQ-DC-U 06/12/2013	WQ-PC-D 06/12/2013	WQ-PC-U 06/12/2013	WQ-DC-U1 06/12/2013	WQ-DC-U2 06/12/2013	WQ-DC-R 06/12/2013	WQ-VC-R 06/11/2013	WQ-MN 06/11/2013	WQ-UMNr 06/11/2013	WQ-BC 06/11/2013
Temperature (in-situ)	°C	-	-	-	-	1.3	1.6	2.1	2.5	2.8	1.6	0.4	1.3	1.2	4.0	2.0	-	6.7
Specific Conductivity (in-situ)	µS/cm	-	-	-	-	1111.0	310.5	196.5	611.2	207.0	190.8	681.7	662.2	500.5	162.0	41.6	-	206.8
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	-	7.66	7.40	7.51	7.51	7.27	7.24	7.36	7.21	6.93	7.44	6.88	-	7.77
Turbidity (in-situ)	NTU	-	-	-	-	6.0	92.3	1.1	24.0	2.2	1.3	2.8	7.5	31.1	8.8	23.1	-	53.3
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	302	1080	304	194	598	196	187	664	649	487	162	39.8	184	205
Hardness (as CaCO3)	mg/L	-	-	0.5	150	658	150	91.3	328	91.1	87.3	379	358	254	77.8	20.6	89	107
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.75	8.12	7.8	7.81	8.01	7.82	7.73	8	7.91	7.9	7.96	7.32	8	8.01
Total Suspended Solids	mg/L	-	50	3	527	11.3	557	3.3	58	<3.0	<3.0	19.3	53.3	105	28	51.3	14.7	445
Total Dissolved Solids	mg/L	-	-	10	214	889	214	144	463	156	149	465	504	362	113	55	106	111
Turbidity	NTU	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	50.1	186	53	37.9	90.4	38.9	37	106	83.9	74.9	56.8	16.4	61.3	67.6
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	50.1	186	53	37.9	90.4	38.9	37	106	83.9	74.9	56.8	16.4	61.3	67.6
Ammonia, Total (as N)	mg/L	-	-	0.005	0.0691	0.102	0.0672	<0.0050	0.243	<0.0050	<0.0050	0.0129	0.0574	0.226	0.0172	0.0432	0.0117	0.0302
Chloride (Cl)	mg/L	-	-	0.5	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.055	0.28	0.057	0.047	0.07	0.049	0.045	0.08	0.068	0.069	0.053	0.055	0.051	0.067
Nitrate (as N)	mg/L	3	-	0.005	0.0169	0.087	0.017	0.006	0.102	0.0122	<0.0050	0.0921	0.0495	0.101	0.0908	0.015	0.103	0.0523
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.010	<0.0010	<0.0010	0.0025	<0.0010	<0.0010	0.0012	0.0017	0.006	<0.0010	<0.0010	<0.0010	<0.0010
Sulf																		



Table A-1. Water Quality Parameter Guideline Exceedances; June 10-12, 2013 trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130612-010	0167-130612-003	0167-130612-011	0167-130612-002	0167-130612-007	0167-130612-006	0167-130612-009	0167-130612-001	0167-130612-005	0167-130612-004	0167-130611-015	0167-130611-016	0167-130611-017	0167-130611-020
				WQ Site ID Date Sampled Detection Limit	WQ-DC-DXr 06/12/2013	WQ-DC-D1b 06/12/2013	WQ-DC-DX 06/12/2013	WQ-ADIT-SEEP 06/12/2013	WQ-DC-U 06/12/2013	WQ-PC-D 06/12/2013	WQ-PC-U 06/12/2013	WQ-DC-U1 06/12/2013	WQ-DC-U2 06/12/2013	WQ-DC-R 06/12/2013	WQ-VC-R 06/11/2013	WQ-MN 06/11/2013	WQ-UMNr 06/11/2013	WQ-BC 06/11/2013
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	0.039	<0.010	<0.010	0.018	<0.010	<0.010	0.02	0.013	0.013	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	<0.000010	0.000667	<0.000010	0.000032	0.000032	0.000201	0.000012	0.000018	0.000022	0.000054	0.000017	0.000018	0.000021	0.000064
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	42.1	159	42.3	26.3	81.1	26.3	25.2	90	87.6	64.2	20.3	5.77	23.2	30.8
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	0.00014	0.00022	0.00014	0.00013	0.00011	<0.00010	0.00023	0.00015	0.00039	0.0001	0.00014
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00025	0.0002	0.00027	<0.00010	0.00084	<0.00010	<0.00010	0.00047	0.00036	0.00084	0.00019	0.00055	0.00012	0.00017
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00109	0.00105	0.00111	0.00147	0.00169	0.00439	0.00125	0.00097	0.00077	0.00174	0.00195	0.00273	0.00185	0.00253
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	1.21	0.122	0.944	0.045	0.983	0.041	0.097	0.247	0.586	1.67	0.489	2.2	0.173	0.207
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	<0.000050	0.000418	<0.000050	<0.000050	0.000065	0.00017	<0.000050	<0.000050	<0.000050	0.00109	0.000121	0.000135	0.000095	0.000143
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	0.00546	<0.00050	<0.00050	0.00258	<0.00050	<0.00050	0.00242	0.00176	0.00074	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	10.8	63.3	10.8	6.23	30.4	6.19	5.95	37.5	33.8	22.7	6.6	1.51	7.57	7.3
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0811	0.365	0.0728	0.000344	0.595	0.00218	0.00612	0.128	0.369	0.725	0.0735	0.14	0.0711	0.307
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	<0.000050	0.000214	<0.000050	0.00006	0.000324	0.000058	0.000053	0.000242	0.000256	0.000342	0.00033	0.00018	0.000348	0.000751
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	<0.00050	0.00085	<0.00050	<0.00050	0.00105	<0.00050	<0.00050	0.00078	0.00079	0.00109	0.00065	0.00213	<0.00050	0.00067
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	3.43	3.7	3.3	0.61	2.04	0.61	0.57	2.52	2.01	1.8	0.71	0.71	0.7	0.81
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	3.84	4.77	3.78	4.77	3.66	4.66	4.87	3.73	4.58	3.62	4.62	4.7	4.57	5.42
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	0.000016	0.000022	<0.000010	<0.000010	<0.000010	0.000032	0.000013	0.000017	0.000014	0.000014	0.000027	0.000027	0.00001	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.37	4.84	2.4	2.52	5.24	2.51	2.49	3.34	3.66	4.7	2	1.17	2.22	2.44
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.129	0.381	0.129	0.167	0.235	0.171	0.165	0.215	0.243	0.199	0.163	0.0299	0.189	0.184
Sulfur (S)-Dissolved	mg/L	-	-	0.5	32.3	150	32.3	18.1	76.5	18.4	17.5	86.2	88.3	59.3	8.69	0.6	10.4	12.8
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	0.000023	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	-	-	0.00001	0.000058	0.00223	0.000063	0.000077	0.00102	0.000074	0.00013	0.0011	0.000958	0.000868	0.000424	0.000104	0.000452	0.000691
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0013	0.275	0.0023	0.0056	0.0064	0.0182	0.0033	0.0185	0.0161	0.0099	0.0016	0.0021	0.0013	0.0015



Table A-1. Water Quality Parameter Guideline Exceedances; June 10-12, 2013 trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130611-022	0167-130611-024	0167-130611-026	0167-130611-031	0167-130611-025	0167-130611-023	0167-130611-019	0167-130611-018	0167-130611-014	0167-130611-021	0167-130611-027	0167-130611-029	0167-130611-028	0167-130612-030
				WQ Site ID Date Sampled Detection Limit	WQ-TP 06/11/2013	WQ-SP-1 06/11/2013	WQ-SEEP 06/11/2013	WQ-DC-DX+105 06/11/2013	WQ-VC-REF 06/11/2013	WQ-SP-2 06/11/2013	WQ-VC-U 06/11/2013	WQ-VC-DBC 06/11/2013	WQ-MS-S-03 06/11/2013	WQ-VC-UMN 06/11/2013	WQ-PIT-1 06/11/2013	WQ-PIT-3 06/11/2013	WQ-PIT-2 06/11/2013	WQ-PW 06/12/2013
Temperature (in-situ)	°C	-	-	-	13.5	9.3	6.2	2.3	5.1	3.4	4.5	4.6	1.1	4.5	8.7	4.5	8.3	1.7
Specific Conductivity (in-situ)	µS/cm	-	-	-	853.0	959.0	1470.0	803.8	128.0	1621.0	128.5	138.5	1247.0	185.1	1167.0	2071.0	1580.0	420.8
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.76	7.22	6.77	6.77	7.57	6.77	7.47	7.46	6.64	7.46	7.82	7.14	7.36	7.35
Turbidity (in-situ)	NTU	-	-	-	22.2	25.0	47.6	35.9	11.1	78.4	6.2	6.9	2.0	5.8	2.3	3.6	2.6	0.4
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	11.6	8.8	10.7	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	<5.0
Conductivity	µS/cm	-	-	2	1000	970	1440	784	128	1420	128	137	1220	186	1130	1700	1290	394
Hardness (as CaCO3)	mg/L	-	-	0.5	555	508	788	448	64.1	754	64	68.1	737	90.4	686	1070	730	213
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.91	7.85	7.64	7.74	7.97	7.61	7.97	7.99	7.78	8.02	7.78	7.94	8.02	8.12
Total Suspended Solids	mg/L	-	50	3	36.7	9.3	32	86.7	13.3	26	12.7	20.7	10.7	10.7	6.2	6	4	-
Total Dissolved Solids	mg/L	-	-	10	795	755	1150	616	94	1160	97	95	994	133	929	1540	1110	244
Turbidity	NTU	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.10
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	66.4	161	219	166	55.2	220	62.8	62.2	256	64.6	85.7	158	106	-
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	66.4	161	219	166	55.2	220	62.8	62.2	256	64.6	85.7	158	106	176
Ammonia, Total (as N)	mg/L	-	-	0.005	0.375	1.93	4.04	<0.0050	<0.0050	7.09	<0.0050	<0.0050	0.0621	0.0118	<0.0050	<0.0050	<0.0050	-
Chloride (Cl)	mg/L	-	-	0.5	<2.5	0.54	<5.0	<0.50	<0.50	<5.0	<0.50	<0.50	<5.0	<0.50	<5.0	<5.0	<5.0	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.16	0.063	<0.20	0.148	0.047	<0.20	0.042	0.045	0.29	0.047	0.22	0.24	0.23	0.107
Nitrate (as N)	mg/L	3	-	0.005	0.138	1.91	1.07	0.0424	0.0865	1.68	0.0876	0.0848	<0.050	0.101	<0.050	<0.050	<0.050	0.15
Nitrite (as N)	mg/L	0.06	-	0.001	0.0091	0.0463	0.028	<0.0010	<0.0010	0.068	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	504	381	660	292	9.93	639	9.96	13.3	500	32.1	608	972	698	39.9
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	0.0064	0.006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	0.0393	0.023	<0.0050	<0.0050	0.05	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Cyanate	mg/L	-	-	0.2	<0.20	0.42	<0.20	0.28	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	2.9	<0.50	<0.50	1.8	<0.50	<0.50	<0.50	<0.50	-	-	-	-
Aluminum (Al)-Total	mg/L	0.005	-	0.003	0.27	0.114	0.0416	2.1	0.302	0.11	0.331	0.407	0.0134	0.231	0.041	0.0624	0.0569	<0.010
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.0402	0.00055	0.00062	0.0112	0.00017	0.0008	0.00016	0.00022	0.0262	0.00034	0.00238	0.00313	0.00333	<0.00050
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.148	0.0103	0.0476	0.044	0.00126	0.0332	0.00121	0.00182	0.0523	0.00262	0.00483	0.00614	0.00608	0.0004
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0168	0.0681	0.0616	0.0579	0.0528	0.0676	0.0534	0.0548	0.0163	0.0492	0.0166	0.0237	0.0234	0.092
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-
Boron (B)-Total	mg/L	-	-	0.01	0.071	0.041	0.083	<0.010	<0.010	0.074	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.10
Cadmium (Cd)-Total	mg/L	0.00001	0.02	0.00001	0.00325	0.000444	0.000495	0.00565	0.000048	0.000513	0.000041	0.000061	0.00931	0.000044	0.00486	0.00567	0.00632	<0.00020
Calcium (Ca)-Total	mg/L	-	-	0.05	156	149	232	113	16.3	235	16.6	18.4	193	23.2	191	293	253	49.1
Chromium (Cr)-Total	mg/L	0.001	0.04	0.0001	0.00029	<0.00060	0.00058	0.00349	<0.00060	<0.00070	<0.00060	<0.00070	<0.00020	<0.00060	0.00101	0.00081	0.0002	<0.0020
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00138	0.00542	0.00714	0.00152	0.00022	0.0081	0.00022	0.00026	0.00234	0.00022	0.00018	0.00019	0.0002	-
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.0433	0.00963	0.00736	0.00599	<0.0030	0.0069	<0.0030	<0.0035	<0.0020	<0.0025	0.00364	0.00407	0.00302	<0.0010
Iron (Fe)-Total	mg/L	0.3	1	0.01	1.14	3.71	10.4	3.28	0.515	8.72	0.528	0.667	1.94	0.504	0.06	0.078	0.066	<0.030
Lead (Pb)-Total	mg/L	0.001	0.1	0.00005	0.0348	0.000894	0.000358	0.00391	0.000692	0.00137	0.000706	0.00089	0.00175	0.000765	0.00128	0.00168	0.00152	0.00061
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0064	<0.00050	0.00146	0.00669	0.00062	<0.00050	0.00061	0.00066	0.00859	0.00061	0.00496	0.00783	0.00605	-
Magnesium (Mg)-Total	mg/L	-	-	0.1	37.3	31.7	46.6	36.5	5.54	43.3	5.53	5.9	61.2	7.49	50	82.7	69.1	21.9
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	1.93	2.49	5.35	0.902	0.024	5.46	0.0261	0.0675	2.13	0.0754	0.19	0.268	0.228	<0.0020
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.000016	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00020
Molybdenum (Mo)-Total	mg/L	0.073	-	0.00005	0.00139	<0.00070	0.00136	<0.00030	<0.00040	<0.0010	<0.00035	<0.00045	<0.00035	<0.00040	0.000284	0.000283	0.000126	-
Nickel (Ni)-Total	mg/L	0.025	0.3	0.0005	0.00233	0.00232	0.00241	0.00348	0.00062	0.00276	0.00061	0.00073	0.00349	0.0006	0.00111	0.00119	0.00138	-
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	0.069	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-
Potassium (K)-Total	mg/L	-	-	0.1	8.73	3.66	6.03	3.48	5.85	0.63	0.59	0.66	3.46	0.72	2.12	3.25	2.66	0.91
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	0.00015	0.00021	0.00013	<0.00010	0.00021	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0010
Silicon (Si)-Total	mg/L	-	-	0.05	2.32	4.67	6.65	7.82	4.89	6.33	4.95	5.28	6.11	4.89	1.97	2.87	2.54	-
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.00074	0.000081	0.000043	0.000129	0.000033	0.000055	0.000029	0.000027	0.00002	0.000022	0.000015	0.000028	0.000019	-
Sodium (Na)-Total	mg/L	-	-	0.05	12.4	18.3	36.4	3.39	1.7	37.2	1.73	1.83	4.69	2.2	6.16	10.9	9	5
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.376	0.473	0.678	0.261	0.19	0.693	0.192	0.188	0.395	0.192	0.515	0.926	0.797	-
Sulfur (S)-Total	mg/L	-	-	0.5	168	128	217	93.1	3.42	212	3.43	4.57	163	10.3	197	312	263	-
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000208	0.000016	<0.000010	0.000133	0.000014	0.000016	<0.000010	<0.000010	0.000124	<0.000010	0.000046	0.000067	0.000061	-
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
Uranium (U)-Total	mg/L	-	-	0.00001	0.000719	0.00211	0.00219	0.00241	0.000459	0.00224	0.000456	0.000487	0.00353	0.000497	0.00185	0.00359	0.00287	0.00227
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	0.0021	0.0093	0.0012	0.0015	0.0012	0.0015	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	-
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.272	0.0148	0.0088	0.96	0.0035	0.0142	0.0047	0.0048	1.95	0.0043	0.566	0.699	0.753	<0.050
Dissolved Metals Filtration Location	-	-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	-
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.0173	0.0206	0.0084	0.0141	0.0									



Table A-1. Water Quality Parameter Guideline Exceedances; June 10-12, 2013 trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130611-022	0167-130611-024	0167-130611-026	0167-130611-031	0167-130611-025	0167-130611-023	0167-130611-019	0167-130611-018	0167-130611-014	0167-130611-021	0167-130611-027	0167-130611-029	0167-130611-028	0167-130612-030
				WQ Site ID Date Sampled Detection Limit	WQ-TP 06/11/2013	WQ-SP-1 06/11/2013	WQ-SEEP 06/11/2013	WQ-DC-DX+105 06/11/2013	WQ-VC-REF 06/11/2013	WQ-SP-2 06/11/2013	WQ-VC-U 06/11/2013	WQ-VC-DBC 06/11/2013	WQ-MS-S-03 06/11/2013	WQ-VC-UMN 06/11/2013	WQ-PIT-1 06/11/2013	WQ-PIT-3 06/11/2013	WQ-PIT-2 06/11/2013	WQ-PW 06/12/2013
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-
Boron (B)-Dissolved	mg/L	-	-	0.01	0.061	0.031	0.07	<0.010	<0.010	0.066	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	0.00264	0.000323	0.000351	0.00503	0.000013	0.000391	0.000016	0.00002	0.00838	0.000021	0.005	0.0056	0.00469	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	160	151	238	118	16.6	233	16.7	18	196	23.6	193	295	204	-
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	0.00023	0.00031	<0.00010	0.00013	0.0002	0.00012	0.00012	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00132	0.00525	0.0072	0.00066	<0.00010	0.00769	<0.00010	<0.00010	0.00226	0.00013	0.00016	0.00017	0.00015	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.0272	0.00743	0.00247	0.001	0.00188	0.00394	0.00192	0.00189	<0.00020	0.00192	0.0016	0.00211	0.00166	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.119	0.468	5.89	0.125	0.137	0.411	0.13	0.14	1.78	0.175	<0.010	<0.010	<0.010	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	0.00204	<0.000050	<0.000050	0.000206	0.000053	0.000099	0.000051	0.000059	0.000298	0.000094	0.000182	0.000332	0.000174	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.00472	<0.00050	<0.00050	0.00455	<0.00050	<0.00050	0.0005	<0.00050	0.0088	0.00055	0.00507	0.0078	0.00497	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	37.5	31.8	47	37.4	5.51	42.1	5.44	5.64	60.2	7.64	49.6	82	53.9	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	1.89	2.41	5.44	0.882	0.0163	5.21	0.0193	0.0537	2.1	0.0682	0.189	0.259	0.177	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.00141	0.000531	0.000919	0.000197	0.000314	0.000802	0.000305	0.000348	0.000335	0.000352	0.000112	0.000111	0.000107	-
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	0.00229	0.0021	0.00223	0.00195	<0.00050	0.00244	<0.00050	<0.00050	0.00338	<0.00050	0.00108	0.00111	0.00103	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	8.57	3.73	6.19	3.31	0.56	5.8	0.52	0.56	3.39	0.71	2.08	3.16	2.11	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	0.00016	0.0002	<0.00010	<0.00010	0.00019	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	1.74	4.5	6.51	5.16	4.53	5.81	4.52	4.56	6.02	4.65	1.86	2.7	1.97	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	0.000098	0.000033	0.000025	0.000014	0.00002	0.000016	0.000024	0.000013	0.000019	<0.000010	<0.000010	<0.000010	<0.000010	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	12.3	18	36.8	3.38	1.69	35.6	1.78	1.78	4.6	2.27	6.19	11	6.08	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.4	0.386	0.681	0.274	0.183	0.636	0.18	0.18	0.404	0.189	0.566	0.91	0.577	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	167	126	213	95.2	3.39	202	3.38	4.46	157	10.4	193	309	208	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	0.000198	0.000012	<0.000010	0.000058	<0.000010	0.000012	<0.000010	<0.000010	0.000124	<0.000010	0.000059	0.000065	0.000049	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
Uranium (U)-Dissolved	mg/L	-	-	0.00001	0.000736	0.00179	0.00222	0.00229	0.000366	0.00208	0.000384	0.000401	0.00365	0.000461	0.00198	0.00356	0.00194	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.21	0.0088	0.0067	0.963	0.0011	0.0111	<0.0010	0.004	1.96	0.002	0.577	0.696	0.55	-



Table A-1. Water Quality Parameter Guideline Exceedances; June 10-12, 2013 trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130612-012	TRAVEL	FIELD
				WQ Site ID Date Sampled Detection Limit	WQ-DRY 06/12/2013		
Temperature (in-situ)	°C	-	-	-	0.9	-	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	322.8	-	-
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.53	-	-
Turbidity (in-situ)	NTU	-	-	-	0.5	-	-
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-
Conductivity	µS/cm	-	-	2	323	<2.0	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	174	<0.50	<0.50
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	8.2	6.01	5.92
Total Suspended Solids	mg/L	-	50	3	<3.0	<3.0	<3.0
Total Dissolved Solids	mg/L	-	-	10	205	<10	<10
Turbidity	NTU	-	-	0.1	-	-	-
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	145	1.2	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	145	1.2	<1.0
Ammonia, Total (as N)	mg/L	-	-	0.005	<0.0050	<0.0050	<0.0050
Chloride (Cl)	mg/L	-	-	0.5	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.049	<0.020	<0.020
Nitrate (as N)	mg/L	3	-	0.005	0.565	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	26.1	<0.50	<0.50
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	-	-
Aluminum (Al)-Total	mg/L	0.005	-	0.003	0.006	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00037	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0006	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0675	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00001	0.02	0.00001	<0.000010	<0.000010	<0.000010
Calcium (Ca)-Total	mg/L	-	-	0.05	48.7	<0.050	<0.050
Chromium (Cr)-Total	mg/L	0.001	0.04	0.0001	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	<0.0010	<0.00050	<0.00050
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.012	<0.010	<0.010
Lead (Pb)-Total	mg/L	0.001	0.1	0.00005	<0.000050	<0.000050	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0005	0.00143	<0.00050	<0.00050
Magnesium (Mg)-Total	mg/L	-	-	0.1	13.1	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.000518	<0.000050	<0.000050
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.073	-	0.00005	<0.00010	<0.000050	<0.000050
Nickel (Ni)-Total	mg/L	0.025	0.3	0.0005	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	2.53	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	5.12	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.000018	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	2.39	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.139	<0.00020	<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5	8.73	<0.50	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000011	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	-	-	0.00001	0.000306	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030	<0.0030	<0.0030
Dissolved Metals Filtration Location	-	-	-	n/a	FIELD	-	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.0045	-	<0.0010
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00034	-	<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.0006	-	<0.00010
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0672	-	<0.000050

Applied Guidelines: - Federal CCME Canadian Environmental Quality Guidelines (JUL, 2012), CCME: Freshwater Aquatic Life
- Mount Nansen Effluent Discharge Standards

Color Key:

Exceeds CCME Guideline

Exceeds MN Effluent Discharge Standards

Exceeds both CCME and MN Standards

Note: For those guidelines that are hardness dependent, the most conservative guideline has been applied.



Table A-1. Water Quality Parameter Guideline Exceedances; June 10-12, 2013 trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-130612-012	TRAVEL	FIELD
				WQ Site ID Date Sampled Detection Limit	WQ-DRY 06/12/2013		
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	-	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	-	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	-	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	<0.000010	-	<0.000010
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	48.7	-	<0.050
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	-	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	-	<0.00010
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00067	-	<0.00020
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	<0.010	-	<0.010
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	0.000189	-	<0.000050
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.00136	-	<0.00050
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	12.8	-	<0.10
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.000384	-	<0.000050
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	-	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.000056	-	<0.000050
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	<0.00050	-	<0.00050
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	-	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	2.44	-	<0.10
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	-	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	5.02	-	<0.050
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000010	-	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.3	-	<0.050
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.132	-	<0.00020
Sulfur (S)-Dissolved	mg/L	-	-	0.5	8.54	-	<0.50
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	-	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	-	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	-	<0.010
Uranium (U)-Dissolved	mg/L	-	-	0.00001	0.000289	-	<0.000010
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	-	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	<0.0010	-	<0.0010



Appendix B:
ALS Analytical Reports



ENVIRONMENTAL DYNAMICS INC.
ATTN: MEGHAN MARJANOVIC
2195 - 2nd Avenue
Whitehorse YT Y1A 3T8

Date Received: 12-JUN-13
Report Date: 24-JUN-13 17:56 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1316088
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1, 2, 3, 4, 5
Legal Site Desc:

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-1 Water 12-JUN-13 12:00 0167-130612-010	L1316088-2 Water 12-JUN-13 12:00 0167-130612-003	L1316088-3 Water 12-JUN-13 12:00 0167-130612-011	L1316088-4 Water 12-JUN-13 12:00 0167-130612-002	L1316088-5 Water 12-JUN-13 12:00 0167-130612-007
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	302	1080	304	194	598
	Hardness (as CaCO3) (mg/L)	150	658	150	91.3	328
	pH (pH)	7.75	8.12	7.80	7.81	8.01
	Total Suspended Solids (mg/L)	527	11.3	557	3.3	58.0
	Total Dissolved Solids (mg/L)	214	889	214	144	463
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	50.1	186	53.0	37.9	90.4
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	50.1	186	53.0	37.9	90.4
	Ammonia, Total (as N) (mg/L)	0.0691	0.102	0.0672	<0.0050	0.243
	Chloride (Cl) (mg/L)	<0.50	<5.0 ^{DLA}	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.055	0.28	0.057	0.047	0.070
	Nitrate (as N) (mg/L)	0.0169	0.087	0.0170	0.0060	0.102
	Nitrite (as N) (mg/L)	<0.0010	<0.010 ^{DLA}	<0.0010	<0.0010	0.0025
	Sulfate (SO4) (mg/L)	100	479	101	56.2	236
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	0.30	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	8.42	0.117	6.84	0.0449	0.895
	Antimony (Sb)-Total (mg/L)	0.00417	0.0111	0.00326	0.00075	0.00151
	Arsenic (As)-Total (mg/L)	0.114	0.0436	0.0850	0.00188	0.0119
	Barium (Ba)-Total (mg/L)	0.178	0.0220	0.151	0.0329	0.0609
	Beryllium (Be)-Total (mg/L)	0.00036	<0.00010	0.00023	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	0.038	<0.010	<0.010	0.018
	Cadmium (Cd)-Total (mg/L)	0.000474	0.000974	0.000369	0.000035	0.000113
	Calcium (Ca)-Total (mg/L)	44.0	154	44.3	25.8	78.3
	Chromium (Cr)-Total (mg/L)	0.0132	0.00034	0.00911	0.00117	0.00162
	Cobalt (Co)-Total (mg/L)	0.00506	0.00025	0.00421	<0.00010	0.00131
	Copper (Cu)-Total (mg/L)	0.0230	0.00261	0.0157	0.00321	0.00436
	Iron (Fe)-Total (mg/L)	15.6	0.573	12.2	0.075	2.83
	Lead (Pb)-Total (mg/L)	0.0168	0.0204	0.0135	0.000199	0.00110
	Lithium (Li)-Total (mg/L)	0.00589	0.00486	0.00432	<0.00050	0.00160
	Magnesium (Mg)-Total (mg/L)	13.7	63.3	13.2	6.23	29.3
	Manganese (Mn)-Total (mg/L)	0.261	0.368	0.194	0.00140	0.612
	Mercury (Hg)-Total (mg/L)	0.000022	<0.000010	0.000029	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-6 Water 12-JUN-13 12:00 0167-130612-006	L1316088-7 Water 12-JUN-13 12:00 0167-130612-009	L1316088-8 Water 12-JUN-13 12:00 0167-130612-001	L1316088-9 Water 12-JUN-13 12:00 0167-130612-005	L1316088-10 Water 12-JUN-13 12:00 0167-130612-004
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	196	187	664	649	487
	Hardness (as CaCO3) (mg/L)	91.1	87.3	379	358	254
	pH (pH)	7.82	7.73	8.00	7.91	7.90
	Total Suspended Solids (mg/L)	<3.0	<3.0	19.3	53.3	105
	Total Dissolved Solids (mg/L)	156	149	465	504	362
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	38.9	37.0	106	83.9	74.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	38.9	37.0	106	83.9	74.9
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	0.0129	0.0574	0.226
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.049	0.045	0.080	0.068	0.069
	Nitrate (as N) (mg/L)	0.0122	<0.0050	0.0921	0.0495	0.101
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0012	0.0017	0.0060
	Sulfate (SO4) (mg/L)	57.9	54.5	264	271	183
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	0.21
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0455	0.0521	0.189	0.492	1.42
	Antimony (Sb)-Total (mg/L)	0.00122	0.00060	0.00237	0.00205	0.00765
	Arsenic (As)-Total (mg/L)	0.00347	0.00182	0.00573	0.00778	0.0816
	Barium (Ba)-Total (mg/L)	0.0297	0.0320	0.0296	0.0392	0.0669
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.023	0.017	0.016
	Cadmium (Cd)-Total (mg/L)	0.000170	0.000017	0.000029	0.000063	0.000694
	Calcium (Ca)-Total (mg/L)	25.9	24.3	87.6	87.1	63.3
	Chromium (Cr)-Total (mg/L)	0.00021	0.00026	0.00111	0.00092	0.00263
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	0.00053	0.00063	0.00148
	Copper (Cu)-Total (mg/L)	0.00462	0.00142	0.00273	0.00207	0.00599
	Iron (Fe)-Total (mg/L)	0.062	0.123	0.615	1.40	4.55
	Lead (Pb)-Total (mg/L)	0.000659	0.000104	0.000172	0.000635	0.0336
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	0.00247	0.00211	0.00154
	Magnesium (Mg)-Total (mg/L)	6.16	5.80	37.4	33.8	22.3
	Manganese (Mn)-Total (mg/L)	0.00282	0.00683	0.136	0.394	0.750
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-11 Water 11-JUN-13 12:00 0167-130611-015	L1316088-12 Water 11-JUN-13 12:00 0167-130611-016	L1316088-13 Water 11-JUN-13 12:00 0167-130611-017	L1316088-14 Water 11-JUN-13 12:00 0167-130611-020	L1316088-15 Water 11-JUN-13 12:00 0167-130611-022
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	162	39.8	184	205	1000
	Hardness (as CaCO3) (mg/L)	77.8	20.6	89.0	107	555
	pH (pH)	7.96	7.32	8.00	8.01	7.91
	Total Suspended Solids (mg/L)	28.0	51.3	14.7	445	36.7
	Total Dissolved Solids (mg/L)	113	55	106	111	795
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	56.8	16.4	61.3	67.6	66.4
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	56.8	16.4	61.3	67.6	66.4
	Ammonia, Total (as N) (mg/L)	0.0172	0.0432	0.0117	0.0302	0.375
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<2.5 ^{DLA}
	Fluoride (F) (mg/L)	0.053	0.055	0.051	0.067	0.16
	Nitrate (as N) (mg/L)	0.0908	0.0150	0.103	0.0523	0.138
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0091
	Sulfate (SO4) (mg/L)	26.8	1.21	31.8	39.9	504
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.405	0.983	0.244	4.33	0.270
	Antimony (Sb)-Total (mg/L)	0.00040	0.00031	0.00040	0.00076	0.0402
	Arsenic (As)-Total (mg/L)	0.00318	0.00441	0.00268	0.0138	0.148
	Barium (Ba)-Total (mg/L)	0.0524	0.0695	0.0507	0.129	0.0168
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00021	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.071
	Cadmium (Cd)-Total (mg/L)	0.000060	0.000091	0.000054	0.000596	0.00325
	Calcium (Ca)-Total (mg/L)	20.0	5.96	22.8	33.3	156
	Chromium (Cr)-Total (mg/L)	0.00078	0.00333	0.00047	0.00813	0.00029
	Cobalt (Co)-Total (mg/L)	0.00036	0.00105	0.00021	0.00279	0.00138
	Copper (Cu)-Total (mg/L)	0.00304	0.00751	0.00253	0.0172	0.0433
	Iron (Fe)-Total (mg/L)	1.05	3.49	0.511	6.52	1.14
	Lead (Pb)-Total (mg/L)	0.000943	0.000683	0.000797	0.0102	0.0348
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00322	0.00640
	Magnesium (Mg)-Total (mg/L)	6.52	1.69	7.64	8.80	37.3
	Manganese (Mn)-Total (mg/L)	0.0869	0.172	0.0794	0.499	1.93
	Mercury (Hg)-Total (mg/L)	<0.000010	0.000019	<0.000010	<0.000010	0.000016

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-16 Water 11-JUN-13 12:00 0167-130611-024	L1316088-17 Water 11-JUN-13 12:00 0167-130611-026	L1316088-18 Water 11-JUN-13 12:00 0167-130611-031	L1316088-19 Water 11-JUN-13 12:00 0167-130611-025	L1316088-20 Water 11-JUN-13 12:00 0167-130611-023
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	970	1440	784	128	1420
	Hardness (as CaCO3) (mg/L)	508	788	448	64.1	754
	pH (pH)	7.85	7.64	7.74	7.97	7.61
	Total Suspended Solids (mg/L)	9.3	32.0	86.7	13.3	26.0
	Total Dissolved Solids (mg/L)	755	1150	616	94	1160
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	161	219	166	55.2	220
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	161	219	166	55.2	220
	Ammonia, Total (as N) (mg/L)	1.93	4.04	<0.0050	<0.0050	7.09
	Chloride (Cl) (mg/L)	0.54	<5.0 ^{DLA}	<0.50	<0.50	<5.0 ^{DLA}
	Fluoride (F) (mg/L)	0.063	<0.20 ^{DLA}	0.148	0.047	<0.20 ^{DLA}
	Nitrate (as N) (mg/L)	1.91	1.07	0.0424	0.0865	1.68
	Nitrite (as N) (mg/L)	0.0463	0.028	<0.0010	<0.0010	0.068
	Sulfate (SO4) (mg/L)	381	660	292	9.93	639
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0064	0.0060	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0393	0.0230	<0.0050	<0.0050	0.0500
	Cyanate (mg/L)	0.42	<0.20	0.28	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	2.90	<0.50	<0.50	1.80
Total Metals	Aluminum (Al)-Total (mg/L)	0.114	0.0416	2.10	0.302	0.110
	Antimony (Sb)-Total (mg/L)	0.00055	0.00062	0.0112	0.00017	0.00080
	Arsenic (As)-Total (mg/L)	0.0103	0.0476	0.0440	0.00126	0.0332
	Barium (Ba)-Total (mg/L)	0.0681	0.0616	0.0579	0.0528	0.0676
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.041	0.083	<0.010	<0.010	0.074
	Cadmium (Cd)-Total (mg/L)	0.000444	0.000495	0.00565	0.000048	0.000513
	Calcium (Ca)-Total (mg/L)	149	232	113	16.3	235
	Chromium (Cr)-Total (mg/L)	<0.00060 ^{DLB}	0.00058	0.00349	<0.00060 ^{DLB}	<0.00070 ^{DLB}
	Cobalt (Co)-Total (mg/L)	0.00542	0.00714	0.00152	0.00022	0.00810
	Copper (Cu)-Total (mg/L)	0.00963	0.00736	0.00599	<0.0030 ^{DLB}	0.00690
	Iron (Fe)-Total (mg/L)	3.71	10.4	3.28	0.515	8.72
	Lead (Pb)-Total (mg/L)	0.000894	0.000358	0.00391	0.000692	0.00137
	Lithium (Li)-Total (mg/L)	<0.00050	0.00146	0.00669	0.00062	<0.00050
	Magnesium (Mg)-Total (mg/L)	31.7	46.6	36.5	5.54	43.3
	Manganese (Mn)-Total (mg/L)	2.49	5.35	0.902	0.0240	5.46
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-21 Water 11-JUN-13 12:00 0167-130611-019	L1316088-22 Water 11-JUN-13 12:00 0167-130611-018	L1316088-23 Water 11-JUN-13 12:00 0167-130611-014	L1316088-24 Water 11-JUN-13 12:00 0167-130611-021	L1316088-29 Water 12-JUN-13 12:00 0167-130612-012
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	128	137	1220	186	323
	Hardness (as CaCO3) (mg/L)	64.0	68.1	737	90.4	174
	pH (pH)	7.97	7.99	7.78	8.02	8.20
	Total Suspended Solids (mg/L)	12.7	20.7	10.7	10.7	<3.0
	Total Dissolved Solids (mg/L)	97	95	994	133	205
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	62.8	62.2	256	64.6	145
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	62.8	62.2	256	64.6	145
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	0.0621 ^{DLA}	0.0118	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<5.0 ^{DLA}	<0.50	<0.50
	Fluoride (F) (mg/L)	0.042	0.045	0.29 ^{DLA}	0.047	0.049
	Nitrate (as N) (mg/L)	0.0876	0.0848	<0.050 ^{DLA}	0.101	0.565
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.010 ^{DLA}	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	9.96	13.3	500	32.1	26.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.331	0.407	0.0134	0.231	0.0060
	Antimony (Sb)-Total (mg/L)	0.00016	0.00022	0.0262	0.00034	0.00037
	Arsenic (As)-Total (mg/L)	0.00121	0.00182	0.0523	0.00262	0.00060
	Barium (Ba)-Total (mg/L)	0.0534	0.0548	0.0163	0.0492	0.0675
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000041	0.000061	0.00931	0.000044	<0.000010
	Calcium (Ca)-Total (mg/L)	16.6 ^{DLB}	18.4 ^{DLB}	193 ^{DLB}	23.2 ^{DLB}	48.7
	Chromium (Cr)-Total (mg/L)	<0.00060	<0.00070	<0.00020	<0.00060	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00022 ^{DLB}	0.00026 ^{DLB}	0.00234 ^{DLB}	0.00022 ^{DLB}	<0.00010 ^{DLB}
	Copper (Cu)-Total (mg/L)	<0.0030	<0.0035	<0.0020	<0.0025	<0.0010
	Iron (Fe)-Total (mg/L)	0.528	0.667	1.94	0.504	0.012
	Lead (Pb)-Total (mg/L)	0.000706	0.000890	0.00175	0.000765	<0.000050
	Lithium (Li)-Total (mg/L)	0.00061	0.00066	0.00859	0.00061	0.00143
	Magnesium (Mg)-Total (mg/L)	5.53	5.90	61.2	7.49	13.1
	Manganese (Mn)-Total (mg/L)	0.0261	0.0675	2.13	0.0754	0.000518
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1316088-30	L1316088-31			
		Description	Water	Water			
		Sampled Date	11-JUN-13	11-JUN-13			
		Sampled Time	12:00	12:00			
		Client ID	TRAVEL BLANK	FIELD BLANK			
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		<2.0	<2.0			
	Hardness (as CaCO3) (mg/L)		<0.50	<0.50			
	pH (pH)		6.01	5.92			
	Total Suspended Solids (mg/L)		<3.0	<3.0			
	Total Dissolved Solids (mg/L)		<10	<10			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		1.2 ^{RRV}	<1.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<1.0 ^{RRV}	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<1.0 ^{RRV}	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)		1.2 ^{RRV}	<1.0			
	Ammonia, Total (as N) (mg/L)		<0.0050	<0.0050			
	Chloride (Cl) (mg/L)		<0.50	<0.50			
	Fluoride (F) (mg/L)		<0.020	<0.020			
	Nitrate (as N) (mg/L)		<0.0050	<0.0050			
	Nitrite (as N) (mg/L)		<0.0010	<0.0010			
	Sulfate (SO4) (mg/L)		<0.50	<0.50			
Cyanides	Cyanide, Weak Acid Diss (mg/L)		<0.0050	<0.0050			
	Cyanide, Total (mg/L)		<0.0050	<0.0050			
	Cyanate (mg/L)		<0.20	<0.20			
	Thiocyanate (SCN) (mg/L)						
Total Metals	Aluminum (Al)-Total (mg/L)		<0.0030	<0.0030			
	Antimony (Sb)-Total (mg/L)		<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)		<0.00010	<0.00010			
	Barium (Ba)-Total (mg/L)		<0.000050	<0.000050			
	Beryllium (Be)-Total (mg/L)		<0.00010	<0.00010			
	Bismuth (Bi)-Total (mg/L)		<0.00050	<0.00050			
	Boron (B)-Total (mg/L)		<0.010	<0.010			
	Cadmium (Cd)-Total (mg/L)		<0.000010	<0.000010			
	Calcium (Ca)-Total (mg/L)		<0.050	<0.050			
	Chromium (Cr)-Total (mg/L)		<0.00010	<0.00010			
	Cobalt (Co)-Total (mg/L)		<0.00010	<0.00010			
	Copper (Cu)-Total (mg/L)		<0.00050	<0.00050			
	Iron (Fe)-Total (mg/L)		<0.010	<0.010			
	Lead (Pb)-Total (mg/L)		<0.000050	<0.000050			
	Lithium (Li)-Total (mg/L)		<0.00050	<0.00050			
	Magnesium (Mg)-Total (mg/L)		<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)		<0.000050	<0.000050			
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-1 Water 12-JUN-13 12:00 0167-130612-010	L1316088-2 Water 12-JUN-13 12:00 0167-130612-003	L1316088-3 Water 12-JUN-13 12:00 0167-130612-011	L1316088-4 Water 12-JUN-13 12:00 0167-130612-002	L1316088-5 Water 12-JUN-13 12:00 0167-130612-007
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000526	0.000192	0.000185	0.000295	0.000378
	Nickel (Ni)-Total (mg/L)	0.00711	0.00091	0.00568	0.00052	0.00201
	Phosphorus (P)-Total (mg/L)	0.571	<0.050	0.497	<0.050	0.052
	Potassium (K)-Total (mg/L)	4.44	3.84	4.20	0.63	2.09
	Selenium (Se)-Total (mg/L)	0.00023	<0.00010	0.00019	<0.00010	0.00014
	Silicon (Si)-Total (mg/L)	15.9	5.04	13.7	4.79	4.65
	Silver (Ag)-Total (mg/L)	0.000329	0.000171	0.000228	0.000018	0.000024
	Sodium (Na)-Total (mg/L)	2.62	4.79	2.71	2.51	5.03
	Strontium (Sr)-Total (mg/L)	0.149	0.338	0.141	0.175	0.244
	Sulfur (S)-Total (mg/L)	31.4	151	31.9	18.1	74.7
	Thallium (Tl)-Total (mg/L)	0.000222	0.000033	0.000180	<0.000010	0.000016
	Tin (Sn)-Total (mg/L)	0.00015	<0.00010	0.00012	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.388	<0.010	0.341	<0.010	0.041
	Uranium (U)-Total (mg/L)	0.00102	0.00207	0.000726	0.000077	0.00120
	Vanadium (V)-Total (mg/L)	0.0390	<0.0010	0.0307	<0.0010	0.0043
	Zinc (Zn)-Total (mg/L)	0.0636	0.278	0.0544	0.0078	0.0151
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0134	0.0048	0.0127	0.0283	0.125
	Antimony (Sb)-Dissolved (mg/L)	0.00110	0.00795	0.00108	0.00061	0.00121
	Arsenic (As)-Dissolved (mg/L)	0.00441	0.0194	0.00436	0.00166	0.00659
	Barium (Ba)-Dissolved (mg/L)	0.0572	0.0194	0.0551	0.0331	0.0468
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	0.039	<0.010	<0.010	0.018
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000667	<0.000010	0.000032	0.000032
	Calcium (Ca)-Dissolved (mg/L)	42.1	159	42.3	26.3	81.1
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.00014	0.00022
	Cobalt (Co)-Dissolved (mg/L)	0.00025	0.00020	0.00027	<0.00010	0.00084
	Copper (Cu)-Dissolved (mg/L)	0.00109	0.00105	0.00111	0.00147	0.00169
	Iron (Fe)-Dissolved (mg/L)	1.21	0.122	0.944	0.045	0.983
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000418	<0.000050	<0.000050	0.000065
	Lithium (Li)-Dissolved (mg/L)	<0.00050	0.00546	<0.00050	<0.00050	0.00258
	Magnesium (Mg)-Dissolved (mg/L)	10.8	63.3	10.8	6.23	30.4
	Manganese (Mn)-Dissolved (mg/L)	0.0811	0.365	0.0728	0.000344	0.595
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000214	<0.000050	0.000060	0.000324
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00085	<0.00050	<0.00050	0.00105

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-6 Water 12-JUN-13 12:00 0167-130612-006	L1316088-7 Water 12-JUN-13 12:00 0167-130612-009	L1316088-8 Water 12-JUN-13 12:00 0167-130612-001	L1316088-9 Water 12-JUN-13 12:00 0167-130612-005	L1316088-10 Water 12-JUN-13 12:00 0167-130612-004
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000066	0.000061	0.000460	0.000289	0.000409
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.00097	0.00129	0.00233
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	0.051	0.100
	Potassium (K)-Total (mg/L)	0.63	0.56	2.51	2.03	1.91
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00013
	Silicon (Si)-Total (mg/L)	4.64	4.78	3.84	5.22	5.38
	Silver (Ag)-Total (mg/L)	0.000013	<0.000010	0.000019	0.000014	0.000520
	Sodium (Na)-Total (mg/L)	2.56	2.52	3.45	3.82	4.60
	Strontium (Sr)-Total (mg/L)	0.170	0.170	0.222	0.256	0.203
	Sulfur (S)-Total (mg/L)	18.3	17.2	86.5	89.6	57.9
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000011	0.000032
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	0.026	0.062
	Uranium (U)-Total (mg/L)	0.000078	0.000135	0.00113	0.00110	0.00101
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0011	0.0025	0.0062
	Zinc (Zn)-Total (mg/L)	0.0167	<0.0030	0.0203	0.0247	0.0515
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0293	0.0356	0.0645	0.0158	0.107
	Antimony (Sb)-Dissolved (mg/L)	0.00115	0.00054	0.00226	0.00180	0.00193
	Arsenic (As)-Dissolved (mg/L)	0.00311	0.00161	0.00297	0.00410	0.0205
	Barium (Ba)-Dissolved (mg/L)	0.0303	0.0320	0.0274	0.0309	0.0437
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	0.020	0.013	0.013
	Cadmium (Cd)-Dissolved (mg/L)	0.000201	0.000012	0.000018	0.000022	0.000054
	Calcium (Ca)-Dissolved (mg/L)	26.3	25.2	90.0	87.6	64.2
	Chromium (Cr)-Dissolved (mg/L)	0.00014	0.00013	0.00011	<0.00010	0.00023
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00047	0.00036	0.00084
	Copper (Cu)-Dissolved (mg/L)	0.00439	0.00125	0.00097	0.00077	0.00174
	Iron (Fe)-Dissolved (mg/L)	0.041	0.097	0.247	0.586	1.67
	Lead (Pb)-Dissolved (mg/L)	0.000170	<0.000050	<0.000050	<0.000050	0.00109
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	0.00242	0.00176	0.00074
	Magnesium (Mg)-Dissolved (mg/L)	6.19	5.95	37.5	33.8	22.7
	Manganese (Mn)-Dissolved (mg/L)	0.00218	0.00612	0.128	0.369	0.725
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000058	0.000053	0.000242	0.000256	0.000342
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.00078	0.00079	0.00109

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-11 Water 11-JUN-13 12:00 0167-130611-015	L1316088-12 Water 11-JUN-13 12:00 0167-130611-016	L1316088-13 Water 11-JUN-13 12:00 0167-130611-017	L1316088-14 Water 11-JUN-13 12:00 0167-130611-020	L1316088-15 Water 11-JUN-13 12:00 0167-130611-022
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000374	0.000843	0.000369	0.00116	0.00139
	Nickel (Ni)-Total (mg/L)	0.00111	0.00349	0.00064	0.00595	0.00233
	Phosphorus (P)-Total (mg/L)	<0.050	0.053	<0.050	0.356	<0.050
	Potassium (K)-Total (mg/L)	0.75	0.80	0.76	1.55	8.73
	Selenium (Se)-Total (mg/L)	<0.00010	0.00016	<0.00010	0.00011	<0.00010
	Silicon (Si)-Total (mg/L)	5.12	5.60	4.90	11.8	2.32
	Silver (Ag)-Total (mg/L)	0.000020	0.000019	0.000014	0.000095	0.000740
	Sodium (Na)-Total (mg/L)	2.01	1.19	2.22	2.69	12.4
	Strontium (Sr)-Total (mg/L)	0.172	0.0332	0.194	0.209	0.376
	Sulfur (S)-Total (mg/L)	8.79	0.66	10.2	12.7	168
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000018	<0.000010	0.000061	0.000208
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
	Titanium (Ti)-Total (mg/L)	0.013	0.035	<0.010	0.205	<0.010
	Uranium (U)-Total (mg/L)	0.000512	0.000249	0.000525	0.00118	0.000719
	Vanadium (V)-Total (mg/L)	0.0020	0.0065	0.0010	0.0152	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0047	0.0108	0.0048	0.0357	0.272
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0559	0.174	0.0319	0.0355	0.0173
	Antimony (Sb)-Dissolved (mg/L)	0.00027	0.00017	0.00028	0.00037	0.0379
	Arsenic (As)-Dissolved (mg/L)	0.00183	0.00246	0.00176	0.00329	0.0496
	Barium (Ba)-Dissolved (mg/L)	0.0465	0.0486	0.0465	0.0442	0.0139
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	0.061
	Cadmium (Cd)-Dissolved (mg/L)	0.000017	0.000018	0.000021	0.000064	0.00264
	Calcium (Ca)-Dissolved (mg/L)	20.3	5.77	23.2	30.8	160
	Chromium (Cr)-Dissolved (mg/L)	0.00015	0.00039	0.00010	0.00014	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00019	0.00055	0.00012	0.00017	0.00132
	Copper (Cu)-Dissolved (mg/L)	0.00195	0.00273	0.00185	0.00253	0.0272
	Iron (Fe)-Dissolved (mg/L)	0.489	2.20	0.173	0.207	0.119
	Lead (Pb)-Dissolved (mg/L)	0.000121	0.000135	0.000095	0.000143	0.00204
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00472
	Magnesium (Mg)-Dissolved (mg/L)	6.60	1.51	7.57	7.30	37.5
	Manganese (Mn)-Dissolved (mg/L)	0.0735	0.140	0.0711	0.307	1.89
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000330	0.000180	0.000348	0.000751	0.00141
	Nickel (Ni)-Dissolved (mg/L)	0.00065	0.00213	<0.00050	0.00067	0.00229

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-16 Water 11-JUN-13 12:00 0167-130611-024	L1316088-17 Water 11-JUN-13 12:00 0167-130611-026	L1316088-18 Water 11-JUN-13 12:00 0167-130611-031	L1316088-19 Water 11-JUN-13 12:00 0167-130611-025	L1316088-20 Water 11-JUN-13 12:00 0167-130611-023
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.00070 ^{DLB}	0.00136	<0.00030 ^{DLB}	<0.00040 ^{DLB}	<0.0010 ^{DLB}
	Nickel (Ni)-Total (mg/L)	0.00232	0.00241	0.00348	0.00062	0.00276
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	0.069	<0.050	<0.050
	Potassium (K)-Total (mg/L)	3.66	6.03	3.48	0.63	5.85
	Selenium (Se)-Total (mg/L)	0.00015	0.00021	0.00013	<0.00010	0.00021
	Silicon (Si)-Total (mg/L)	4.67	6.65	7.82	4.89	6.33
	Silver (Ag)-Total (mg/L)	0.000081	0.000043	0.000129	0.000033	0.000055
	Sodium (Na)-Total (mg/L)	18.3	36.4	3.39	1.70	37.2
	Strontium (Sr)-Total (mg/L)	0.473	0.678	0.261	0.190	0.693
	Sulfur (S)-Total (mg/L)	128	217	93.1	3.42	212
	Thallium (Tl)-Total (mg/L)	0.000016	<0.000010	0.000133	0.000014	0.000016
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.101	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00211	0.00219	0.00241	0.000459	0.00224
	Vanadium (V)-Total (mg/L)	<0.0010	0.0021	0.0093	0.0012	0.0015
	Zinc (Zn)-Total (mg/L)	0.0148	0.0088	0.960	0.0035	0.0142
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0206	0.0084	0.0141	0.0387	0.0128
	Antimony (Sb)-Dissolved (mg/L)	0.00038	0.00054	0.0119	<0.00010	0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00288	0.0280	0.00785	0.00053	0.00471
	Barium (Ba)-Dissolved (mg/L)	0.0651	0.0595	0.0374	0.0476	0.0596
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.031	0.070	<0.010	<0.010	0.066
	Cadmium (Cd)-Dissolved (mg/L)	0.000323	0.000351	0.00503	0.000013	0.000391
	Calcium (Ca)-Dissolved (mg/L)	151	238	118	16.6	233
	Chromium (Cr)-Dissolved (mg/L)	0.00023	0.00031	<0.00010	0.00013	0.00020
	Cobalt (Co)-Dissolved (mg/L)	0.00525	0.00720	0.00066	<0.00010	0.00769
	Copper (Cu)-Dissolved (mg/L)	0.00743	0.00247	0.00100	0.00188	0.00394
	Iron (Fe)-Dissolved (mg/L)	0.468	5.89	0.125	0.137	0.411
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000206	0.000053	0.000099
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	0.00455	<0.00050	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)	31.8	47.0	37.4	5.51	42.1
	Manganese (Mn)-Dissolved (mg/L)	2.41	5.44	0.882	0.0163	5.21
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000531	0.000919	0.000197	0.000314	0.000802
	Nickel (Ni)-Dissolved (mg/L)	0.00210	0.00223	0.00195	<0.00050	0.00244

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-21 Water 11-JUN-13 12:00 0167-130611-019	L1316088-22 Water 11-JUN-13 12:00 0167-130611-018	L1316088-23 Water 11-JUN-13 12:00 0167-130611-014	L1316088-24 Water 11-JUN-13 12:00 0167-130611-021	L1316088-29 Water 12-JUN-13 12:00 0167-130612-012
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	^{DLB} <0.00035	^{DLB} <0.00045	^{DLB} <0.00035	^{DLB} <0.00040	^{DLB} <0.00010
	Nickel (Ni)-Total (mg/L)	0.00061	0.00073	0.00349	0.00060	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.59	0.66	3.46	0.72	2.53
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	4.95	5.28	6.11	4.89	5.12
	Silver (Ag)-Total (mg/L)	0.000029	0.000027	0.000020	0.000022	0.000018
	Sodium (Na)-Total (mg/L)	1.73	1.83	4.69	2.20	2.39
	Strontium (Sr)-Total (mg/L)	0.192	0.188	0.395	0.192	0.139
	Sulfur (S)-Total (mg/L)	3.43	4.57	163	10.3	8.73
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000124	<0.000010	0.000011
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.011	0.018	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000456	0.000487	0.00353	0.000497	0.000306
	Vanadium (V)-Total (mg/L)	0.0012	0.0015	<0.0010	0.0011	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0047	0.0048	1.95	0.0043	<0.0030
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0412	0.0356	0.0013	0.0316	0.0045
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00013	0.0269	0.00028	0.00034
	Arsenic (As)-Dissolved (mg/L)	0.00054	0.00087	0.0354	0.00180	0.00060
	Barium (Ba)-Dissolved (mg/L)	0.0502	0.0474	0.0162	0.0476	0.0672
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000016	0.000020	0.00838	0.000021	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	16.7	18.0	196	23.6	48.7
	Chromium (Cr)-Dissolved (mg/L)	0.00012	0.00012	<0.00010	0.00012	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00226	0.00013	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00192	0.00189	<0.00020	0.00192	0.00067
	Iron (Fe)-Dissolved (mg/L)	0.130	0.140	1.78	0.175	<0.010
	Lead (Pb)-Dissolved (mg/L)	0.000051	0.000059	0.000298	0.000094	0.000189
	Lithium (Li)-Dissolved (mg/L)	0.00050	<0.00050	0.00880	0.00055	0.00136
	Magnesium (Mg)-Dissolved (mg/L)	5.44	5.64	60.2	7.64	12.8
	Manganese (Mn)-Dissolved (mg/L)	0.0193	0.0537	2.10	0.0682	0.000384
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000305	0.000348	0.000335	0.000352	0.000056
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.00338	<0.00050	<0.00050

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

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		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L1316088-30		L1316088-31		
		Water		Water		
		11-JUN-13		11-JUN-13		
		12:00		12:00		
		TRAVEL BLANK		FIELD BLANK		
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	<0.10	<0.10			
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	<0.050	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	<0.050	<0.050			
	Strontium (Sr)-Total (mg/L)	<0.00020	<0.00020			
	Sulfur (S)-Total (mg/L)	<0.50	<0.50			
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.000010	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030			
Dissolved Metals	Dissolved Metals Filtration Location		FIELD			
	Aluminum (Al)-Dissolved (mg/L)		<0.0010			
	Antimony (Sb)-Dissolved (mg/L)		<0.00010			
	Arsenic (As)-Dissolved (mg/L)		<0.00010			
	Barium (Ba)-Dissolved (mg/L)		<0.000050			
	Beryllium (Be)-Dissolved (mg/L)		<0.00010			
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050			
	Boron (B)-Dissolved (mg/L)		<0.010			
	Cadmium (Cd)-Dissolved (mg/L)		<0.000010			
	Calcium (Ca)-Dissolved (mg/L)		<0.050			
	Chromium (Cr)-Dissolved (mg/L)		<0.00010			
	Cobalt (Co)-Dissolved (mg/L)		<0.00010			
	Copper (Cu)-Dissolved (mg/L)		<0.00020			
	Iron (Fe)-Dissolved (mg/L)		<0.010			
	Lead (Pb)-Dissolved (mg/L)		<0.000050			
	Lithium (Li)-Dissolved (mg/L)		<0.00050			
	Magnesium (Mg)-Dissolved (mg/L)		<0.10			
	Manganese (Mn)-Dissolved (mg/L)		<0.000050			
	Mercury (Hg)-Dissolved (mg/L)		<0.000010			
	Molybdenum (Mo)-Dissolved (mg/L)		<0.000050			
	Nickel (Ni)-Dissolved (mg/L)		<0.00050			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-1 Water 12-JUN-13 12:00 0167-130612-010	L1316088-2 Water 12-JUN-13 12:00 0167-130612-003	L1316088-3 Water 12-JUN-13 12:00 0167-130612-011	L1316088-4 Water 12-JUN-13 12:00 0167-130612-002	L1316088-5 Water 12-JUN-13 12:00 0167-130612-007
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.43	3.70	3.30	0.61	2.04
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	3.84	4.77	3.78	4.77	3.66
	Silver (Ag)-Dissolved (mg/L)	0.000016	0.000022	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.37	4.84	2.40	2.52	5.24
	Strontium (Sr)-Dissolved (mg/L)	0.129	0.381	0.129	0.167	0.235
	Sulfur (S)-Dissolved (mg/L)	32.3	150	32.3	18.1	76.5
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000023	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000058	0.00223	0.000063	0.000077	0.00102
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0013	0.275	0.0023	0.0056	0.0064

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-6 Water 12-JUN-13 12:00 0167-130612-006	L1316088-7 Water 12-JUN-13 12:00 0167-130612-009	L1316088-8 Water 12-JUN-13 12:00 0167-130612-001	L1316088-9 Water 12-JUN-13 12:00 0167-130612-005	L1316088-10 Water 12-JUN-13 12:00 0167-130612-004
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.61	0.57	2.52	2.01	1.80
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	4.66	4.87	3.73	4.58	3.62
	Silver (Ag)-Dissolved (mg/L)	0.000032	0.000013	0.000017	0.000014	0.000014
	Sodium (Na)-Dissolved (mg/L)	2.51	2.49	3.34	3.66	4.70
	Strontium (Sr)-Dissolved (mg/L)	0.171	0.165	0.215	0.243	0.199
	Sulfur (S)-Dissolved (mg/L)	18.4	17.5	86.2	88.3	59.3
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000074	0.000130	0.00110	0.000958	0.000868
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0182	0.0033	0.0185	0.0161	0.0099

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-11 Water 11-JUN-13 12:00 0167-130611-015	L1316088-12 Water 11-JUN-13 12:00 0167-130611-016	L1316088-13 Water 11-JUN-13 12:00 0167-130611-017	L1316088-14 Water 11-JUN-13 12:00 0167-130611-020	L1316088-15 Water 11-JUN-13 12:00 0167-130611-022
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.71	0.71	0.70	0.81	8.57
	Selenium (Se)-Dissolved (mg/L)	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	4.62	4.70	4.57	5.42	1.74
	Silver (Ag)-Dissolved (mg/L)	0.000027	0.000027	0.000010	<0.000010	0.000098
	Sodium (Na)-Dissolved (mg/L)	2.00	1.17	2.22	2.44	12.3
	Strontium (Sr)-Dissolved (mg/L)	0.163	0.0299	0.189	0.184	0.400
	Sulfur (S)-Dissolved (mg/L)	8.69	0.60	10.4	12.8	167
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000198
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000424	0.000104	0.000452	0.000691	0.000736
	Vanadium (V)-Dissolved (mg/L)	<0.0010	0.0021	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0016	0.0021	0.0013	0.0015	0.210

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-16 Water 11-JUN-13 12:00 0167-130611-024	L1316088-17 Water 11-JUN-13 12:00 0167-130611-026	L1316088-18 Water 11-JUN-13 12:00 0167-130611-031	L1316088-19 Water 11-JUN-13 12:00 0167-130611-025	L1316088-20 Water 11-JUN-13 12:00 0167-130611-023
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.73	6.19	3.31	0.56	5.80
	Selenium (Se)-Dissolved (mg/L)	0.00016	0.00020	<0.00010	<0.00010	0.00019
	Silicon (Si)-Dissolved (mg/L)	4.50	6.51	5.16	4.53	5.81
	Silver (Ag)-Dissolved (mg/L)	0.000033	0.000025	0.000014	0.000020	0.000016
	Sodium (Na)-Dissolved (mg/L)	18.0	36.8	3.38	1.69	35.6
	Strontium (Sr)-Dissolved (mg/L)	0.386	0.681	0.274	0.183	0.636
	Sulfur (S)-Dissolved (mg/L)	126	213	95.2	3.39	202
	Thallium (Tl)-Dissolved (mg/L)	0.000012	<0.000010	0.000058	<0.000010	0.000012
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00179	0.00222	0.00229	0.000366	0.00208
	Vanadium (V)-Dissolved (mg/L)	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0088	0.0067	0.963	0.0011	0.0111

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316088-21 Water 11-JUN-13 12:00 0167-130611-019	L1316088-22 Water 11-JUN-13 12:00 0167-130611-018	L1316088-23 Water 11-JUN-13 12:00 0167-130611-014	L1316088-24 Water 11-JUN-13 12:00 0167-130611-021	L1316088-29 Water 12-JUN-13 12:00 0167-130612-012
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.52	0.56	3.39	0.71	2.44
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	4.52	4.56	6.02	4.65	5.02
	Silver (Ag)-Dissolved (mg/L)	0.000024	0.000013	0.000019	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.78	1.78	4.60	2.27	2.30
	Strontium (Sr)-Dissolved (mg/L)	0.180	0.180	0.404	0.189	0.132
	Sulfur (S)-Dissolved (mg/L)	3.38	4.46	157	10.4	8.54
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000124	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000384	0.000401	0.00365	0.000461	0.000289
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0040	1.96	0.0020	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1316088-30	L1316088-31			
		Description	Water	Water			
		Sampled Date	11-JUN-13	11-JUN-13			
		Sampled Time	12:00	12:00			
		Client ID	TRAVEL BLANK	FIELD BLANK			
Grouping	Analyte						
WATER							
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)			<0.050			
	Potassium (K)-Dissolved (mg/L)			<0.10			
	Selenium (Se)-Dissolved (mg/L)			<0.00010			
	Silicon (Si)-Dissolved (mg/L)			<0.050			
	Silver (Ag)-Dissolved (mg/L)			<0.000010			
	Sodium (Na)-Dissolved (mg/L)			<0.050			
	Strontium (Sr)-Dissolved (mg/L)			<0.00020			
	Sulfur (S)-Dissolved (mg/L)			<0.50			
	Thallium (Tl)-Dissolved (mg/L)			<0.000010			
	Tin (Sn)-Dissolved (mg/L)			<0.00010			
	Titanium (Ti)-Dissolved (mg/L)			<0.010			
	Uranium (U)-Dissolved (mg/L)			<0.000010			
	Vanadium (V)-Dissolved (mg/L)			<0.0010			
	Zinc (Zn)-Dissolved (mg/L)			<0.0010			

* 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)
Duplicate	Chloride (Cl)	DLA	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Duplicate	Nitrite (as N)	DLA	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Fluoride (F)	K	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Method Blank	Chromium (Cr)-Total	MB-LOR	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Method Blank	Copper (Cu)-Total	MB-LOR	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Method Blank	Molybdenum (Mo)-Total	MB-LOR	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Matrix Spike	Boron (B)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Mercury (Hg)-Total	MS-B	L1316088-20, -21, -22, -23, -24, -29, -30, -31
Matrix Spike	Sulfate (SO4)	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -30, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Matrix Spike	Manganese (Mn)-Total	MS-B	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Matrix Spike	Strontium (Sr)-Total	MS-B	L1316088-16, -17, -18, -19, -20, -21, -22, -23, -24, -29
Matrix Spike	Strontium (Sr)-Total	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	-2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9 L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316088-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -29, -3, -31, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-CL-IC-WR	Water	Chloride by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
ANIONS-F-IC-WR	Water	Fluoride by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
ANIONS-NO2-IC-WR	Water	Nitrite Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.			
ANIONS-NO3-IC-WR	Water	Nitrate Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.			
ANIONS-SO4-IC-WR	Water	Sulphate by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
CN-CNO-WT	Water	Cyanate	APHA 4500-CN-L
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-TOT-WT	Water	Cyanide, Total	APHA 4500CN C E-STRONG ACID DIST COLORIM
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
CN-WAD-WT	Water	Cyanide, Weak Acid Diss	APHA 4500CN I-Weak acid Dist Colorimet
Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

Reference Information

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-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

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 filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

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 a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 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 APHA 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 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).

NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

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.

S-DIS-ICP-VA Water Dissolved Sulfur 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Reference Information

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA Water Total Sulfur 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

** 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
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1	2	3	4	5
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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 ww - 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.

[illegible]

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 provided on a separate Excel table.

SHIPMENT RECEPTION (tab use only)	SHIPMENT VERIFICATION (tab use only)
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SHIPMENT RELEASE (client use)		Received by:		Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
Released by:	<i>[Signature]</i>	Date (dd-mm-yy)	Time (hh-mm)	<i>[Signature]</i>						Observations: Yes / No ? If Yes add SIF
		June 12	2013			°C				
Megharaj Rajanovic		9 May 13 00:00		12 June 13	10:30pm					GENF 18.01 Front

[illegible]



Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

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Page _____ of _____

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Page ____ of ____

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ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
3-478 Range Road
Whitehorse YT Y1A 3A2

Date Received: 13-JUN-13
Report Date: 10-JUL-13
Version: INTERNAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1316270
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1
Legal Site Desc:

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1316270-1	L1316270-2	L1316270-3	L1316270-4	
		Description	Water	Water	Water	Water	
		Sampled Date	11-JUN-13	11-JUN-13	11-JUN-13	12-JUN-13	
		Sampled Time	12:00	12:00	12:00	12:00	
		Client ID	0167-130611-027	0167-130611-029	0167-130611-028	0167-130612-030	
Grouping	Analyte						
WATER							
Physical Tests	Colour, True (CU)					<5.0	
	Conductivity (uS/cm)		1130	1700	1290	394	
	Hardness (as CaCO3) (mg/L)		686	1070	730	213	
	pH (pH)		7.78	7.94	8.02	8.12	
	Total Suspended Solids (mg/L)		6.2	6.0	4.0		
	Total Dissolved Solids (mg/L)		929	1540	1110	244	
	Turbidity (NTU)					<0.10	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		85.7	158	106		
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)		85.7	158	106	176	
	Ammonia, Total (as N) (mg/L)		<0.0050	<0.0050	<0.0050		
	Chloride (Cl) (mg/L)		<5.0	<5.0	<5.0	<0.50	
	Fluoride (F) (mg/L)		0.22	0.24	0.23	0.107	
	Nitrate (as N) (mg/L)		<0.050	<0.050	<0.050	0.150	
	Nitrite (as N) (mg/L)		<0.010	<0.010	<0.010	<0.0010	
	Sulfate (SO4) (mg/L)		608	972	698	39.9	
Total Metals	Aluminum (Al)-Total (mg/L)		0.0410	0.0624	0.0569	<0.010	
	Antimony (Sb)-Total (mg/L)		0.00238	0.00313	0.00333	<0.00050	
	Arsenic (As)-Total (mg/L)		0.00483	0.00614	0.00608	0.00040	
	Barium (Ba)-Total (mg/L)		0.0166	0.0237	0.0234	0.092	
	Beryllium (Be)-Total (mg/L)		<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)		<0.010	<0.010	<0.010	<0.10	
	Cadmium (Cd)-Total (mg/L)		0.00486	0.00567	0.00632	<0.00020	
	Calcium (Ca)-Total (mg/L)		191	293	253	49.1	
	Chromium (Cr)-Total (mg/L)		0.00101	0.00081	0.00020	<0.0020	
	Cobalt (Co)-Total (mg/L)		0.00018	0.00019	0.00020		
	Copper (Cu)-Total (mg/L)		0.00364	0.00407	0.00302	<0.0010	
	Iron (Fe)-Total (mg/L)		0.060	0.078	0.066	<0.030	
	Lead (Pb)-Total (mg/L)		0.00128	0.00168	0.00152	0.00061	
	Lithium (Li)-Total (mg/L)		0.00496	0.00783	0.00605		
	Magnesium (Mg)-Total (mg/L)		50.0	82.7	69.1	21.9	
	Manganese (Mn)-Total (mg/L)		0.190	0.268	0.228	<0.0020	
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.00020	
	Molybdenum (Mo)-Total (mg/L)		0.000284	0.000283	0.000126		
	Nickel (Ni)-Total (mg/L)		0.00111	0.00119	0.00138		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316270-1 Water 11-JUN-13 12:00 0167-130611-027	L1316270-2 Water 11-JUN-13 12:00 0167-130611-029	L1316270-3 Water 11-JUN-13 12:00 0167-130611-028	L1316270-4 Water 12-JUN-13 12:00 0167-130612-030	
Grouping	Analyte					
WATER						
Total Metals	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	2.12	3.25	2.66	0.91	
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.0010	
	Silicon (Si)-Total (mg/L)	1.97	2.87	2.54		
	Silver (Ag)-Total (mg/L)	0.000015	0.000028	0.000019		
	Sodium (Na)-Total (mg/L)	6.16	10.9	9.00	5.0	
	Strontium (Sr)-Total (mg/L)	0.515	0.926	0.797		
	Sulfur (S)-Total (mg/L)	197	312	263		
	Thallium (Tl)-Total (mg/L)	0.000046	0.000067	0.000061		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.00185	0.00359	0.00287	0.00227	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	0.566	0.699	0.753	<0.050	
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0024	0.0011	0.0015		
	Antimony (Sb)-Dissolved (mg/L)	0.00257	0.00297	0.00254		
	Arsenic (As)-Dissolved (mg/L)	0.00366	0.00455	0.00362		
	Barium (Ba)-Dissolved (mg/L)	0.0170	0.0232	0.0167		
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Cadmium (Cd)-Dissolved (mg/L)	0.00500	0.00560	0.00469		
	Calcium (Ca)-Dissolved (mg/L)	193	295	204		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	0.00016	0.00017	0.00015		
	Copper (Cu)-Dissolved (mg/L)	0.00160	0.00211	0.00166		
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Lead (Pb)-Dissolved (mg/L)	0.000182	0.000332	0.000174		
	Lithium (Li)-Dissolved (mg/L)	0.00507	0.00780	0.00497		
	Magnesium (Mg)-Dissolved (mg/L)	49.6	82.0	53.9		
	Manganese (Mn)-Dissolved (mg/L)	0.189	0.259	0.177		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000112	0.000111	0.000107		
	Nickel (Ni)-Dissolved (mg/L)	0.00108	0.00111	0.00103		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	2.08	3.16	2.11		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1316270-1 Water 11-JUN-13 12:00 0167-130611-027	L1316270-2 Water 11-JUN-13 12:00 0167-130611-029	L1316270-3 Water 11-JUN-13 12:00 0167-130611-028	L1316270-4 Water 12-JUN-13 12:00 0167-130612-030	
Grouping	Analyte					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Dissolved (mg/L)	1.86	2.70	1.97		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	6.19	11.0	6.08		
	Strontium (Sr)-Dissolved (mg/L)	0.566	0.910	0.577		
	Sulfur (S)-Dissolved (mg/L)	193	309	208		
	Thallium (Tl)-Dissolved (mg/L)	0.000059	0.000065	0.000049		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.00198	0.00356	0.00194		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.577	0.696	0.550		

* 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)
Duplicate	Chloride (Cl)	DLM	L1316270-4
Duplicate	Nitrite (as N)	DLM	L1316270-4
Duplicate	Nitrate (as N)	DLM	L1316270-4
Duplicate	Chloride (Cl)	DLM	L1316270-4
Duplicate	Nitrite (as N)	DLM	L1316270-4
Matrix Spike	Boron (B)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Boron (B)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1316270-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L1316270-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L1316270-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1316270-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects
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**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-WR	Water	Chloride by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

Reference Information

ANIONS-F-IC-WR Water Fluoride by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-NO2-IC-VA Water Nitrite in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-NO2-IC-WR Water Nitrite Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-NO3-IC-VA Water Nitrate in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-NO3-IC-WR Water Nitrate Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-SO4-IC-WR Water Sulphate by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer BCMOE Colour Single Wavelength

This analysis is carried out using procedures adapted from British Columbia Environmental Manual "Colour- Single Wavelength." Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Apparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

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-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

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 filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-CVAFS-VA Water Total Mercury in Water by CVAFS EPA 245.7

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 a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

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 a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Reference Information

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 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 APHA 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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).

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 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).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

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.

S-DIS-ICP-VA Water Dissolved Sulfur 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA Water Total Sulfur 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** 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
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1

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 ww - 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.



Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC#

Page ____ of ____

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Appendix C:
YG Environmental Health Services Reports



Health and Social Services
Santé et Affaires sociales
Environmental Health Services
Service d'hygiène du milieu

BACTERIOLOGICAL ANALYSIS OF DRINKING WATER
ANALYSE BACTÉRIOLOGIQUE DE L'EAU POTABLE

#2 Hospital Road, Whitehorse, Yukon Y1A 3H8
phone : (867) 667-8391 fax : (867) 667-8322
Toll free: 1-800-661-0408 ext.8391

2 Hospital Road, Whitehorse (Yukon) Y1A 3H8
Tél. : 867-667-8391 Téléc. : 867-667-8322
Sans frais au Yukon 1-800-661-0408, poste 8391

Contact Information • Coordonnées de la personne-ressource

Contact Person Meghan Marjanovic (EDI) Phone 867 393 4852
Personne-ressource Meghan Marjanovic (EDI) Téléphone 867 393 4852
Mailing address 2195 Second Ave Fax 393 4883
Adresse postale Whitehorse YT Télécopieur 393 4883
Postal code Y1A 3T8
Code postal Y1A 3T8
First Nation, Municipal or Business Name MOUNT NANSEN SITE
Nom de la Première nation, de la municipalité ou de l'entreprise MOUNT NANSEN SITE
Agent Fax
Agent Télécopieur

Sampling Location • Lieu de la prise d'échantillon

Municipal Address WQ - PW Subdivision
Adresse municipale WQ - PW Lotissement
Legal Description Lot Quad Plan no.
Désignation officielle Lot Quadrilatère Plan n°
Other Information (e.g., Location, Business / Building Name)
Autres renseignements (ex. : emplacement, nom de l'entreprise, nom de l'édifice)

Sample Collection / Prélèvement de l'échantillon

Sample Collected By Joel MacIsaac Date 130612 Time 14:47 am
Échantillon prélevé par Joel MacIsaac Date 130612 Heure 14:47 pm
YY/MM/DD • AA/MM/JJ

Sampling Site (e.g., kitchen tap) Flowing well
Point d'échantillonnage (ex. : robinet de cuisine) Flowing well
Is this a Resample from a Previous Test? ☐ Yes ☒ No Previous Sample Number
Est-ce un deuxième échantillon d'un test antérieur? ☐ Oui ☒ Non Numéro de l'échantillon précédent

Sample Supply / Source d'approvisionnement en eau

☐ Public Supply ☐ Bulk Water Distributor ☒ Business ☐ Private Residence
Municipal - par canalisation Municipal - par camion Privé - entreprise Privé - résidence

Sample Source / Provenance de l'échantillon

☐ Dug Well ☐ Driven Well ☒ Drilled Well Depth of Well
Puits creusé Puits tubulaire Puits foré à la sondeuse Profondeur du puits
☐ Water Holding Tank ☐ Other (explain)
Réservoir d'eau Autre (précisez)

Water Treatment / Traitement de l'eau

Is the Water Chlorinated? ☐ Yes ☒ No Free Available Chlorine p.p.m.
L'eau contient-elle du chlore? ☐ Oui ☒ Non Chlore libre disponible mg/L

Other Treatment Systems (e.g., UV, softener, filter)
Autre dispositif de traitement (ex. : désinfection aux rayons UV, adoucisseur d'eau, filtre)

For Laboratory Use Only / À l'usage du laboratoire seulement

Receipt of Sample 13-06-13 Time 10:00 am By SS
Réception de l'échantillon 13-06-13 Heure 10:00 pm Par SS
YY/MM/DD • AA/MM/JJ
Condition of Sample ☒ Satisfactory ☐ Unsatisfactory Details 7.40C
État de l'échantillon ☒ Satisfaisant ☐ Non satisfaisant Précisez 7.40C
Incubation 13-06-13 Time 10:00 am By SS Incubator 1
Incubation 13-06-13 Heure 10:00 pm Par SS Incubateur 1
YY/MM/DD • AA/MM/JJ
Analysis Completed 13-06-14 Time 12:00 am By SS
Analyse terminée 13-06-14 Heure 12:00 pm Par SS
YY/MM/DD • AA/MM/JJ

Results (See Reverse Side for Interpretation)

Résultats (Voir au verso l'interprétation des résultats)

Total Coliforms/Coliformes totaux ☐ Present / Présence ☒ Absent / Absence	E. coli/E. coli ☐ Present / Présence ☒ Absent / Absence
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Comments / Commentaires

Report Authorized By SS Position WLT Date 13-06-14
Rapport autorisé par SS Poste WLT Date 13-06-14
YY/MM/DD • AA/MM/JJ

Distribution: White - Chain of Custody Yellow - Client Copy Pink - Lab Copy
Distribution: Blanc - Chaîne de possession Jaune - Client Rose - Laboratoire

YG(4649)NC3 Rev.11/2010

Sample Number : **55050**
Numéro de l'échantillon : **55050**