

June 5, 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: May 27-29, 2013

Trip Dates:	May 27 to 29, 2013
EDI Field Staff:	Joel MacFabe, Brodie Smith, Charles Blysak
Tasks:	Hydrology and Water Quality

Field Summary

EDI completed the surface water quality sampling and hydrometric monitoring at the Mount Nansen site from May 27 through 29, 2013. EDI visited all water quality sites and hydrometric stations. Weather conditions were good during the field visit, with air temperatures mostly warm (~17°C) and sunny. EDI visited all hydrometric stations during the field visit. Stream discharge measurements were completed at all stations with the exception of H-DC-U1 and H-DC-R, where overflow ice prevented the reliable measurement of stream discharge.

The purpose of this field visit was to continue to capture freshet conditions. Stream flow conditions at higher elevation stations continued to be visually elevated above winter low-flows. Larger stream networks such as Victoria Creek were slightly elevated in response to snowmelt occurring at altitude.

Channel conditions at all stations remained similar to the previous trip. Large quantities of overflow ice remained in some sections of Dome Creek at H-DC-R and H-DC-U1. Where overflow ice remains, complex and highly braided channels of flowing water within and on the ice prevent the measurement of stream discharge. With warmer temperatures, any residual ice remaining within Victoria Creek, upstream of the Nansen road is melting rapidly.



Each section below details additional station and site-specific information for 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 (May 15 through 17, 2013) as well as copies of the lab results from ALS. Section 3 contains relevant photos of field sites. Section 4 details additional monitoring program comments, noteworthy observations, and any changes to budget or scope moving forward.

1. Hydrology

Stream discharge measure measurements were collected using the cross sectional area – velocity 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.

Table 1 summarizes the hydrometric program monitoring stations, measurements completed and any additional relevant station details. All hydrometric stations were visited and site conditions documented. Where installed, data loggers were downloaded and re-deployed following hydrometric monitoring.

The hydrometric station at H-VC-R requires additional repair following the field visit. It was observed that additional high flows encountered during the warm temperatures bent the stilling well downstream. The stilling well and staff gauge were corrected in the field. Additional reinforcements are required.

Data loggers were re-deployed at remaining hydrometric stations, H-DC-U1 & U2, H-DC-D1b and H-DC-R. Significant quantities of overflow ice was present at these locations and prohibited the installation of hydrometric stations.

Table 1. Hydrometric program details

Hydrology program dates:	May 27 to 29, 2013
Weather at time of monitoring:	Weather conditions were sunny, with temperatures between 0°C to +18°C.

Site	Hydrometric Measurement Type	Notes & Comments
ATM-DC2/DC4	None	Both atmospheric barologgers downloaded.
H-DC-DX	Salt Slug	Water flowing in very small, partially ice and snow covered channel. Salt tracer method for stream discharge measurement used.
H-DC-DX+105	Salt Slug	Channel is snow and ice free. Salt tracer method used to measure stream discharge.



Site	Hydrometric Measurement Type	Notes & Comments
H-DC-D1b	Salt Slug	Creek remains frozen to substrate at this location. Flowing channel is well developed and visually appears moderate to high discharge. Completed a salt tracer stream discharge measurement.
H-DC-U1	None	Creek remains frozen to substrate at this location. Complex braided channels are developing on and within the ice. Conditions are not suitable for gauging.
H-DC-U2	Salt Slug	Creek is frozen to substrate with water flowing on the surface and within the ice via complex networks (approx. 1.5 m of ice remains). Conditions were not ideal for stream gauging, but salt tracer method used to estimate discharge through existing channel.
H-DC-B	Salt Slug	Stream channel was free of ice with the exception of beneath diversion channel bridge. Flows moderate. Salt tracer method used to estimate discharge. Stilling well and data logger deployed at H-DC-B location.
H-DC-M	Salt Slug	Dome Creek no longer frozen to bed at the stilling well location. High flows and suspended sediment load within channel. Salt tracer used to measure discharge.
H-DC-R	None	Water partially flowing across the Mount Nansen Road, and on the surface of the overflow ice. Conditions not suitable for a discharge measurement due to the absence of a well-defined channel. Significant quantities of overflow ice remain covering the channel and hydrometric station downstream of road, up to approximately 1 m thick.
H-VC-REF	ADV	Victoria Creek at the REF station is unchanged from the previous visit. Water levels were moderate to high, but less than bankfull. The data logger was downloaded, and surveyed. Discharge measured using the mid-section method. Silting was observed in the stilling well and the logger was raised 4.2 cm.
H-VC-U	ADV	Station conditions are unchanged from previous visit. Water levels near bankfull conditions. Discharge measurement completed using the mid-section method.
H-BC	ADV	Station location is open with moderate to high discharge. Bed and suspended sediment load remains high. Mid-section method used to measure discharge. Water level logger downloaded.
H-VC-DBC	ADV	Stream channel conditions unchanged from previous visit. Water level stage is moderate to high. Mid-section method used to measure discharge.
H-VC-UMN	ADV	Channel conditions unchanged from previous visit, with flows moderate to high. Mid-section method used to measure discharge. Water level logger downloaded.
H-MN	ADV & Salt Slug	Channel at station is free of ice with moderate to high flows. A salt tracer and mid-section method was used to measure discharge. A water level logger was deployed at the station and surveyed.
H-VC-R	ADV	Station stilling well displaced by elevated flows following previous visit. Station righted and secured. Stream discharge moderate to high, and measured using the mid-section method.
H-SEEP	Volumetric	A volumetric measurement was made at the pipe discharge. Flow rate and total volume was recorded from the flow meter. No staff gauge reading was obtained due to ice conditions.



Site	Hydrometric Measurement Type	Notes & Comments
H-TP	None	Some ice remains on tailings pond. Staff gauge is not present at station and requires replacement with new staff gauge and survey to geodetic.
H-PC-U	Salt Slug	Water level high at station. Significant quantities of water bypassing the weir structure through alternate channels and beneath the weir.
H-PC-DSP	Salt Slug	Station conditions unchanged from previous visit. The salt tracer method was used to estimate discharge. The water level logger was downloaded.

2. Water Quality

All water quality stations were generally ice-free with water stage elevations declining following freshet. Water quality samples were collected from all monitoring stations with the exception of WQ-MS-S-08. No water was observed at the WQ-MS-S-08 location and therefore could not be sampled. This observation is consistent with the previous sampling event where WQ-MS-S-08 was documented as dry. Some ice remains on the tailings pond. The Brown-McDade pit lake was not sampled during this trip due to unsafe sampling conditions (rotten lake ice). Sampling of the Brown-McDade pit lake will re-commence when ice conditions allow.

All water quality samples were delivered to ALS on Thursday, May 30, 2013. Bacteriological samples collected from the pump house well were submitted to Yukon Government (YG) Environmental Health Services on Thursday, May 30, 2013.

This report includes analytical results summarized with exceedances for samples collected on May 16 and 17, 2013 (Appendix A). The ALS Certificate of Analysis for these samples are also included in Appendix B. Note, there was no bacteriological sample submitted to YG Environmental Health Services for that trip. Please refer to the Mount Nansen Surface Water Field Memo: May 15-17, 2013 (EDI Letter, dated May 22, 2013) for more information.



WQ Sampling dates:	May 28-29, 2013
Weather at time of sampling:	Conditions ranged from 2 °C to 18 °C, with periods of sun and overcast skies.

Site	Sampled? (Yes/No)	Notes / Explanations
WQ-PIT1	No	Ice conditions prevented sampling
WQ-PIT2	No	Ice conditions prevented sampling
WQ-PIT3	No	Ice conditions prevented sampling
WQ-SEEP	Yes	Site conditions normal for time of year.
WQ-TP	Yes	Ice remains over pond, sample collected from open water on edge of pond
WQ-DC-DX	Yes	Creek is open and flowing; some ice cover remaining over the channel. Water was visually clear
WQ-DC-DX+105	Yes	Channel open and ice free, high flows and moderate turbidity levels
WQ-D1b	Yes	Some overflow ice remains, however majority of flow through a single channel.
WQ-DC-U1	Yes	Overflow ice remains at this location. Some water flowing over top of ice, but primarily through a single channel.
WQ-DC-U2	Yes	Overflow ice remains at this location. Water flowing over top of ice, and nearing breakthrough to substrate
WQ-DC-U	Yes	Channel open to substrate, with ice remaining only on margins. Moderate to low turbidity levels
WQ-DC-R	Yes	Channel remains glaciated upstream and downstream of road crossing. Water flowing on surface of overflow ice. Water sample collected immediately upstream of culvert
WQ-VC-REF	Yes	Channel ice free, with water levels elevated above previous trips'.
WQ-VC-U	Yes	Channel is ice free. Water levels are elevated and near bankfull in some locations.
WQ-BC	Yes	Channel open, highly turbid and moderate flows
WQ-VC-DBC	Yes	Channel was open with moderate turbidity and high flows.
WQ-VC-UMN	Yes	Channel was open and ice free. Water levels were near bankfull in some locations.
WQ-MN	Yes	Channel ice-free, conditions consistent with time of year.
WQ-VC-R	Yes	Samples collect at open-water monitoring location, upstream of road culvert. Some overflow ice remains in channel
WQ-PW	Yes	Bacteriological and drinking water samples collected from discharge line
WQ-PC-U	Yes	Sampled from regular location where channel enters small pond
WQ-PC-D	Yes	Channel open and flowing, conditions consistent with time of year.
WQ-ADIT-SEEP	Yes	Water seeping through rocks and into Pony Creek upstream of the WQ-PC-D site



Site	Sampled? (Yes/No)	Notes / Explanations
WQ-MS-S-08	No	Mill Seep was dry at time of attempted sampling.
WQ-MS-S-03	Yes	Some ice still remaining in portions of channel. But sufficient flow for sampling
Quality Assurance/Quality Control Samples		
Field Replicate A	Yes	Collected from WQ-PC-D
Field Replicate B	Yes	Collected from WQ-DC-U
Field Blank	Yes	Samples prepared with laboratory-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. Victoria Creek Station H-VC-R looking downstream (note: displaced stilling well was corrected).



Photo 2. H-VC-UMN station looking upstream. Note the high stage elevation.



Photo 3. H-VC-DBC station looking downstream



Photo 4. H-VC-U station looking upstream.



Photo 5. H-VC-REF looking upstream of the station. Note the high stage elevation, near bankfull conditions.



Photo 6. H-MN station looking upstream. Channel is now ice-free and stilling well exposed.



Photo 7. H-BC station looking upstream.



Photo 8. H-PC-DSP looking upstream.



Photo 9. H-PC-U station looking upstream. Note the additional channels diverting around the weir installation.



Photo 10. H-DC-R station looking downstream. Significant quantities of ice remain.



Photo 11. H-DC-M station looking downstream.



Photo 12. H-DCB station installation looking upstream.



Photo 13. H-DC-U1 station looking upstream. Significant quantities of ice and snow remain within or near channel.



Photo 14. H-DC-U2, looking upstream.



Photo 15. H-DC-D1b station overview photograph, noting large quantities of overflow ice remaining.



Photo 16. H-DC-D1 left bank, showing remaining snow and ice cover within channel.



Photo 17. H-DC-DX+105 station looking upstream.



Photo 18. H-DC-DX station looking upstream.



Photo 19. H-SEEP station.



Photo 20. H-SEEP pond, showing large ice mass present on the surface of the water.



4. Additional Trip Information/Comments

Any changes to project scope (i.e. additional sites sampled):	None
Any alterations to sample scheduling:	No alterations to the sampling schedule
Any events resulting in changes to budget:	No changes to budget
Additional Comments:	None
Wildlife Sightings:	Several ptarmigan, a black bear on Mount Nansen Road
Site concerns including safety concerns:	None
Any additional notes/concerns:	None



Appendix A:
Water Quality Parameter Guideline Exceedances – May 16 - 17, 2013



Table A-1. Water Quality Parameter Guideline Exceedances; May 16 and 17, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-1305-16-001 WQ-DC-DX+105 5/16/2013	0167-1305-16-002 WQ-DC-DX 5/16/2013	0167-1305-16-003 WQ-BC 5/16/2013	0167-1305-17-004 WQ-ADIT-SEEP 5/17/2013	0167-1305-17-005 WQ-TP 5/17/2013	0167-1305-17-006 WQ-MN 5/17/2013	0167-1305-17-007 WQ-PC-U 5/17/2013	0167-1305-17-012 WQ-SEEP-r 5/17/2013	0167-1305-17-013 Field Blank 5/17/2013	0167-1305-16-014 WQ-VC-R 5/16/2013
Temperature (in-situ)	°C	-	-	-	0.6	0.1	2.8	0.1	0.3	0	0	-	-	0
Specific Conductivity (in-situ)	µS/cm	-	-	-	201.6	39.5	64.8	68.8	333	25.4	64.8	-	-	79.2
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	6.81	6.95	7.06	6.89	7.55	6.32	6.67	-	-	6.57
Turbidity (in-situ)	NTU	-	-	-	46.8	0.9	783	1	7.08	11.98	16.69	-	-	14.25
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	216	86.2	80.9	70.4	374	26.1	68.4	1240	<2.0	79.9
Hardness (as CaCO3)	mg/L	-	-	0.5	106	41.7	40.7	37.1	171	14.1	37.3	644	<0.50	41
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.36	7.29	7.29	7.11	7.27	6.74	7.07	7.73	6.2	7.42
Total Suspended Solids	mg/L	-	50	3	123	<3.0	1970	20.1	9.8	18.3	8.2	26	<3.0	17.2
Total Dissolved Solids	mg/L	-	-	10	188	115	111	116	261	79	115	937	<10	62
Turbidity	NTU	-	-	0.1	-	-	-	-	-	-	-	-	-	-
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	26.2	22.9	26.2	15.2	16.1	8.4	13.4	188	1.4	27.3
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
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
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	26.2	22.9	26.2	15.2	16.1	8.4	13.4	188	1.4	27.3
Ammonia, Total (as N)	mg/L	-	-	0.005	0.0122	<0.0050	0.0319	<0.0050	0.107	0.0106	0.0091	3.16	3.64	0.0126
Chloride (Cl)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.042	<0.020	0.042	<0.020	0.05	0.022	<0.020	<0.20	<0.020	0.031
Nitrate (as N)	mg/L	3	-	0.005	<0.0050	<0.0050	0.0129	<0.0050	0.0392	<0.0050	<0.0050	1.1	<0.0050	0.022
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	<0.0010	0.021	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	73	15.8	12.3	13.1	155	0.56	12.6	507	<0.50	10.6
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0057	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.029	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.4	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	0.84	1.32	0.86	1.09	<0.50	0.84	1.35	2.96	<0.50	0.92
Aluminum (Al)-Total	mg/L	0.005	-	0.003	2.6	0.107	25.2	0.293	0.236	0.568	0.311	0.074	<0.0030	0.888
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00498	0.00055	0.00312	0.00039	0.015	0.00014	0.00028	0.00081	<0.00010	0.00029
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0432	0.0054	0.19	0.00318	0.0484	0.003	0.00281	0.0459	<0.00010	0.00431
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0619	0.0134	0.581	0.0256	0.00974	0.0474	0.0272	0.0564	<0.000050	0.0473
Beryllium (Be)-Total	mg/L	-	-	0.0001	0.00015	<0.00010	0.00103	<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	0.00247	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	0.016	<0.010	<0.010	0.059	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00001	0.02	0.00001	0.012	0.000046	0.00361	0.00016	0.00353	0.000052	0.000128	0.000511	<0.000010	0.000122
Calcium (Ca)-Total	mg/L	-	-	0.05	30.3	11.6	22.1	10.9	53.4	4.22	10.9	192	<0.050	11.2
Chromium (Cr)-Total	mg/L	0.001	0.04	0.0001	0.00342	0.00029	0.0362	0.00035	0.0003	0.00113	0.00032	0.00175	<0.00010	0.00098
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00164	<0.00010	0.0172	0.00012	0.00069	0.0007	0.00019	0.00606	<0.00010	0.00053
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.0199	0.00235	0.0614	0.0042	0.0425	0.00366	0.00325	0.00838	<0.00050	0.00451
Iron (Fe)-Total	mg/L	0.3	1	0.01	4.23	0.116	45.1	0.297	0.539	1.75	0.3	10.3	<0.010	1.2
Lead (Pb)-Total	mg/L	0.001	0.1	0.00005	0.0155	0.000193	0.153	0.000561	0.0201	0.000359	0.000237	0.000535	<0.000050	0.00207
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0025	<0.00050	0.0165	<0.00050	0.00136	<0.00050	<0.00050	<0.00050	<0.00050	0.00065
Magnesium (Mg)-Total	mg/L	-	-	0.1	7.27	3.01	10.5	2.23	9.5	0.98	2.2	38.4	<0.10	3.3
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.437	0.0142	1.81	0.0142	0.901	0.159	0.0416	4.21	<0.000050	0.103
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.000032	0.000013	0.000087	0.000014	<0.000010	0.000016	0.000014	<0.000010	<0.000010	0.000013
Molybdenum (Mo)-Total	mg/L	0.073	-	0.00005	0.000129	<0.000050	0.00183	0.000056	0.000424	0.000172	0.000051	0.00101	<0.000050	0.000251
Nickel (Ni)-Total	mg/L	0.025	0.3	0.0005	0.00423	<0.00050	0.026	0.00101	0.00143	0.00193	0.00098	0.00215	<0.00050	0.00148
Phosphorus (P)-Total	mg/L	-	-	0.05	0.162	<0.050	1.62	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	3.12	3.58	4.84	1.35	2.22	1.28	1.35	4.99	<0.10	1.47
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.00012	<0.00010	0.00024	<0.00010	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	6.24	2.46	43.2	2.15	1.23	2.52	2.16	5.68	<0.050	3.76
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.000349	0.00004	0.00149	0.000036	0.000346	0.00001	0.000027	0.000056	<0.000010	0.00004
Sodium (Na)-Total	mg/L	-	-	0.05	0.891	0.575	2.41	0.878	2.42	0.624	0.861	29.2	<0.050	1.06
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0697	0.0387	0.158	0.0733	0.119	0.02	0.07	0.579	<0.00020	0.0881



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Sulfur (S)-Total	mg/L	-	-	0.5	23.6	5.64	4.37	4.72	51.7	0.52	4.56	170	<0.50	3.76
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000108	<0.000010	0.00046	<0.000010	0.00005	<0.000010	<0.000010	0.000011	<0.000010	0.000016
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00044	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	0.106	<0.010	0.845	<0.010	<0.010	0.016	<0.010	<0.010	<0.010	0.035
Uranium (U)-Total	mg/L	-	-	0.00001	0.000434	0.000021	0.0036	0.000108	0.000201	0.000118	0.000101	0.00203	<0.000010	0.000288
Vanadium (V)-Total	mg/L	-	-	0.001	0.0092	<0.0010	0.0766	<0.0010	<0.0010	0.0031	<0.0010	0.0016	<0.0010	0.0021
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	1.19	0.0059	0.336	0.0162	0.382	0.0084	0.0141	0.012	<0.0030	0.0131
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.206	0.0983	0.167	0.257	0.0637	0.184	0.288	0.0309	<0.0010	0.144
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00227	0.00057	0.00026	0.00033	0.0116	<0.00010	0.00029	0.00063	<0.00010	0.00015
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00715	0.00522	0.00319	0.00246	0.0202	0.00228	0.00261	0.0317	<0.00010	0.00141
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0285	0.0137	0.0278	0.025	0.00769	0.0384	0.027	0.0531	<0.000050	0.0382
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
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
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.010	0.055	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	0.011	0.000042	0.000168	0.000115	0.00325	0.000021	0.000119	0.000358	<0.000010	0.000074
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	31	11.7	12	11.1	52.9	4.15	11.2	194	<0.050	11.2
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	0.0002	0.0002	0.00025	0.00025	<0.00010	0.00035	0.00028	0.00035	<0.00010	0.00012
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.0004	<0.00010	0.00035	<0.00010	0.00062	0.00054	0.00017	0.00589	<0.00010	0.00027
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.0143	0.00215	0.00476	0.00354	0.0347	0.00256	0.00304	0.00439	<0.00020	0.00356
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.198	0.105	0.349	0.247	0.186	1.22	0.269	8.6	<0.010	0.371
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	0.000729	0.00008	0.000998	0.000155	0.00398	0.000105	0.000176	0.000098	<0.000050	0.00015
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.00086	<0.00050	<0.00050	<0.00050	0.00089	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	6.92	3.04	2.58	2.27	9.41	0.91	2.28	38.8	<0.10	3.18
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.376	0.0135	0.128	0.00728	0.865	0.149	0.04	4.08	<0.000050	0.0778
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	0.000014	<0.000010	0.000013	<0.000010	<0.000010	0.000012	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.000054	<0.000050	0.000514	<0.000050	0.000332	0.000144	<0.000050	0.000954	<0.000050	0.000192
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	0.0025	<0.00050	0.00117	0.00095	0.00128	0.0016	0.00093	0.00199	<0.00050	0.00106
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
Potassium (K)-Dissolved	mg/L	-	-	0.1	2.92	3.6	1.15	1.39	2.13	1.26	1.42	5.09	<0.10	1.31
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00019	<0.00010	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	2.66	2.46	2.34	2.13	0.837	1.82	2.18	5.6	<0.050	2.33
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	0.000032	0.000034	0.000025	0.000024	0.000054	<0.000010	0.000021	0.000016	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	0.799	0.554	0.987	0.876	2.37	0.618	0.859	27.7	<0.050	0.979
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0638	0.0352	0.073	0.0749	0.104	0.0191	0.0738	0.553	<0.00020	0.0871
Sulfur (S)-Dissolved	mg/L	-	-	0.5	24.5	5.61	4.37	4.73	50.6	<0.50	4.64	167	<0.50	3.74
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	0.000013	<0.000010	<0.000010	<0.000010	0.000038	<0.000010	<0.000010	0.000012	<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
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
Uranium (U)-Dissolved	mg/L	-	-	0.00001	0.000278	0.00002	0.000403	0.000102	0.000163	0.000069	0.000104	0.00211	<0.000010	0.00023
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	0.001	<0.0010	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	1.16	0.0045	0.005	0.0146	0.367	0.005	0.0141	0.0102	<0.0010	0.0064



Table A-1. Water Quality Parameter Guideline Exceedances; May 16 and 17, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-1305-16-015 WQ-VC-UMN 5/16/2013	0167-1305-17-017 WQ-VC-REF 5/16/2013	0167-1305-16-018 WQ-VC-DBC-r 5/16/2013	0167-1305-16-019 WQ-VC-DBC 5/16/2013	0167-1305-16-020 WQ-VC-U 5/16/2013	0167-1305-16-021 WQ-MS-S-03 5/16/2013	0167-1305-17-022 WQ-PC-D 5/17/2013	0167-1305-17-023 WQ-SEEP 5/17/2013	0167-1305-17-026 WQ-DC-U 5/17/2013	0167-1305-17-030 WQ-PW 5/17/2013
Temperature (in-situ)	°C	-	-	-	0	1.1	-	0.9	0.9	0.6	0	1	0	0.6
Specific Conductivity (in-situ)	µS/cm	-	-	-	91.2	50.8	-	63.9	60	1089	74.5	1200	393.6	385.1
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	6.86	6.84	-	6.84	6.79	6.78	6.8	6.8	7	7.33
Turbidity (in-situ)	NTU	-	-	-	20.2	28.9	-	102	27.4	64.4	2.34	18.23	8.49	0
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	<5.0
Conductivity	µS/cm	-	-	2	89.5	54.9	62.8	63.1	59.2	1180	76.2	1230	400	402
Hardness (as CaCO3)	mg/L	-	-	0.5	48	30.1	35.3	34.5	32.8	706	41.3	647	213	220
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.5	7.38	7.44	7.43	7.45	7.88	7.01	7.82	7.83	8.26
Total Suspended Solids	mg/L	-	50	3	48.6	114	320	374	155	74.8	10.7	21.6	21.2	-
Total Dissolved Solids	mg/L	-	-	10	68	78	87	88	81	891	118	863	307	234
Turbidity	NTU	-	-	0.1	-	-	-	-	-	-	-	-	-	0.45
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	29.5	23.4	25	26.5	24.5	258	14	182	59.1	-
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	-
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	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	29.5	23.4	25	26.5	24.5	258	14	182	59.1	197
Ammonia, Total (as N)	mg/L	-	-	0.005	0.0128	0.008	0.0167	0.0153	0.0094	0.087	0.0113	3.43	0.181	-
Chloride (Cl)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<5.0	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.03	0.026	0.028	0.028	<0.020	<0.20	<0.020	<0.20	0.047	0.094
Nitrate (as N)	mg/L	3	-	0.005	0.0305	0.0144	0.017	0.0169	0.0184	<0.050	<0.0050	1.12	0.147	0.147
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	0.031	0.0017	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	13	3.08	4.68	4.67	3.46	447	15.8	520	139	40.7
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.005	<0.0050	-
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0276	<0.0050	-
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-
Thiocyanate (SCN)	mg/L	-	-	0.5	0.87	0.79	0.93	0.95	0.82	<0.50	1.46	2.67	0.8	-
Aluminum (Al)-Total	mg/L	0.005	-	0.003	1.08	2.02	5.44	6.08	2.75	1.37	0.468	0.0822	0.407	<0.010
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00035	0.00022	0.00099	0.00107	0.00027	0.0335	0.00107	0.00086	0.00147	<0.00050
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.00567	0.00434	0.0269	0.0299	0.00577	0.224	0.00887	0.0498	0.0104	0.00039
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0516	0.0678	0.144	0.18	0.101	0.0468	0.0306	0.06	0.0332	0.096
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00022	0.00028	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	-
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	0.00051	<0.00050	0.00101	<0.00050	<0.00050	<0.00050	-
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.068	0.015	<0.10
Cadmium (Cd)-Total	mg/L	0.00001	0.02	0.00001	0.000149	0.000156	0.000565	0.000673	0.000217	0.00556	0.000476	0.000568	0.000506	<0.00020
Calcium (Ca)-Total	mg/L	-	-	0.05	12.2	8.79	11.1	13.7	11.9	207	13.8	215	52.8	50.9
Chromium (Cr)-Total	mg/L	0.001	0.04	0.0001	0.00131	0.00294	0.00725	0.00775	0.00373	0.00182	0.00054	0.00055	0.00055	<0.0020
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00071	0.00133	0.00352	0.00388	0.00179	0.00272	0.00021	0.00681	0.00081	-
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.00532	0.00695	0.0136	0.0163	0.00928	0.0151	0.0104	0.00893	0.00514	<0.0010
Iron (Fe)-Total	mg/L	0.3	1	0.01	1.54	3.02	8.36	8.87	3.97	6.71	0.6	11.6	1.74	<0.030
Lead (Pb)-Total	mg/L	0.001	0.1	0.00005	0.00345	0.00383	0.0206	0.0262	0.00519	0.103	0.00411	0.000609	0.00448	0.00064
Lithium (Li)-Total	mg/L	-	-	0.0005	0.00129	0.00162	0.00406	0.00441	0.00218	0.0114	<0.00050	0.0008	0.00123	-
Magnesium (Mg)-Total	mg/L	-	-	0.1	3.68	2.98	4.18	4.94	4	67.7	2.96	41.6	17	22.7
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.112	0.0974	0.308	0.356	0.133	2.35	0.0346	4.67	0.601	<0.0020
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.000014	0.000013	0.000025	0.00002	0.000013	0.000012	0.000014	<0.000010	<0.000010	<0.00020
Molybdenum (Mo)-Total	mg/L	0.073	-	0.00005	0.000296	0.000289	0.000598	0.000654	0.000311	0.000515	0.000091	0.00116	0.000211	-
Nickel (Ni)-Total	mg/L	0.025	0.3	0.0005	0.00161	0.00257	0.00552	0.00616	0.00334	0.00408	0.00128	0.00246	0.00152	-
Phosphorus (P)-Total	mg/L	-	-	0.05	0.072	0.127	0.405	0.471	0.207	<0.050	<0.050	<0.050	<0.050	-
Potassium (K)-Total	mg/L	-	-	0.1	1.52	1.42	2.21	2.46	1.81	4.36	1.7	5.86	2.29	0.9
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.0010
Silicon (Si)-Total	mg/L	-	-	0.05	4.09	4.93	11.2	12.1	6.58	9.25	2.7	6.24	2.72	-
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.000056	0.000056	0.000215	0.000234	0.00006	0.00173	0.000094	0.000059	0.000034	-
Sodium (Na)-Total	mg/L	-	-	0.05	1.16	0.88	3.17	1.45	1.17	5.22	1.03	32.8	3.25	5.3
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.097	0.0925	0.114	0.138	0.123	0.483	0.0906	0.672	0.162	-



Table A-1. Water Quality Parameter Guideline Exceedances; May 16 and 17, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-1305-16-015 WQ-VC_UMN 5/16/2013	0167-1305-17-017 WQ-VC-REF 5/16/2013	0167-1305-16-018 WQ-VC-DBC-r 5/16/2013	0167-1305-16-019 WQ-VC-DBC 5/16/2013	0167-1305-16-020 WQ-VC-U 5/16/2013	0167-1305-16-021 WQ-MS-S-03 5/16/2013	0167-1305-17-022 WQ-PC-D 5/17/2013	0167-1305-17-023 WQ-SEEP 5/17/2013	0167-1305-17-026 WQ-DC-U 5/17/2013	0167-1305-17-030 WQ-PW 5/17/2013
Sulfur (S)-Total	mg/L	-	-	0.5	4.61	1.3	1.96	2.27	1.86	168	6.43	189	47.3	-
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.00002	0.000024	0.000091	0.000104	0.000034	0.000212	0.000016	0.00001	<0.000010	-
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00013	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Titanium (Ti)-Total	mg/L	-	-	0.01	0.043	0.089	0.226	0.244	0.127	0.063	<0.010	<0.010	0.013	-
Uranium (U)-Total	mg/L	-	-	0.00001	0.000333	0.000545	0.000907	0.00119	0.000716	0.00427	0.000142	0.00238	0.000544	0.00241
Vanadium (V)-Total	mg/L	-	-	0.001	0.0028	0.006	0.0157	0.0178	0.0081	0.0057	<0.0010	0.0018	0.0014	-
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0166	0.0189	0.0571	0.0646	0.025	1.39	0.0453	0.0135	0.0924	<0.050
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	-
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.147	0.149	0.158	0.156	0.156	0.002	0.252	0.0335	0.155	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00017	<0.00010	<0.00010	<0.00010	<0.00010	0.0148	0.0005	0.00062	0.00136	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00122	0.00032	0.00069	0.00066	0.00035	0.08	0.00288	0.0323	0.00629	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0365	0.034	0.0328	0.0345	0.0348	0.0197	0.0232	0.0516	0.0291	-
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	-
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	-
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.056	0.013	-
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	0.000088	0.000046	0.000063	0.000066	0.000045	0.00222	0.000337	0.000364	0.000381	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	13	8.12	9.66	9.4	8.85	184	12.2	196	55.7	-
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	0.00015	0.00017	0.00016	0.0001	0.00016	<0.00010	0.00022	0.00036	0.00015	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00019	0.00017	0.00018	0.00018	0.00016	0.00158	<0.00010	0.00602	0.00072	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00353	0.00335	0.00366	0.00357	0.00339	0.00056	0.0072	0.00455	0.00378	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.253	0.199	0.223	0.215	0.201	2.48	0.255	8.82	1.12	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	0.000152	<0.000050	0.000162	0.000162	<0.000050	0.00061	0.000691	0.000093	0.000369	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.01	<0.00050	0.00052	0.0011	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	3.78	2.39	2.73	2.67	2.6	60.1	2.61	38.1	18	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0658	0.0326	0.0399	0.0382	0.026	1.91	0.0147	4.14	0.621	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000012	<0.000010	<0.000010	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.000198	0.000132	0.000174	0.000174	0.000143	0.000358	<0.000050	0.000975	0.000184	-
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	0.0009	0.0008	0.00089	0.00088	0.00083	0.00245	0.00098	0.00202	0.00118	-
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	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	1.47	1.16	1.34	1.21	1.22	3.45	1.48	5.3	2.32	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00021	<0.00010	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	2.61	2.14	2.45	2.29	2.27	5.98	2.17	5.49	2.41	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000023	0.000015	<0.000010	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	1.07	0.736	0.854	0.847	0.802	4.39	0.896	29.5	3.39	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.103	0.0835	0.0886	0.0853	0.0904	0.454	0.0786	0.585	0.168	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	4.92	1.28	1.97	1.85	1.42	146	5.57	167	48.4	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000091	<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	-
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	-
Uranium (U)-Dissolved	mg/L	-	-	0.00001	0.000266	0.000214	0.000237	0.000243	0.000208	0.00377	0.000099	0.00205	0.000551	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0068	0.003	0.0047	0.0038	0.0039	1.09	0.0335	0.0116	0.0873	-



Table A-1. Water Quality Parameter Guideline Exceedances; May 16 and 17, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	TRIP Trip Blank 5/17/2013
Temperature (in-situ)	°C	-	-	-	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	-
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	-
Turbidity (in-situ)	NTU	-	-	-	-
Colour, True	CU	15	-	5	-
Conductivity	µS/cm	-	-	2	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	-
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	5.98
Total Suspended Solids	mg/L	-	50	3	<3.0
Total Dissolved Solids	mg/L	-	-	10	<10
Turbidity	NTU	-	-	0.1	-
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	<1.0
Ammonia, Total (as N)	mg/L	-	-	0.005	<0.0050
Chloride (Cl)	mg/L	-	-	0.5	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	<0.020
Nitrate (as N)	mg/L	3	-	0.005	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	<0.50
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050
Cyanate	mg/L	-	-	0.2	0.27
Thiocyanate (SCN)	mg/L	-	-	0.5	-
Aluminum (Al)-Total	mg/L	0.005	-	0.003	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	<0.00010
Barium (Ba)-Total	mg/L	-	1	0.00005	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010
Cadmium (Cd)-Total	mg/L	0.00001	0.02	0.00001	<0.000010
Calcium (Ca)-Total	mg/L	-	-	0.05	<0.050
Chromium (Cr)-Total	mg/L	0.001	0.04	0.0001	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	<0.00050
Iron (Fe)-Total	mg/L	0.3	1	0.01	<0.010
Lead (Pb)-Total	mg/L	0.001	0.1	0.00005	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050
Magnesium (Mg)-Total	mg/L	-	-	0.1	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	<0.000050
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010
Molybdenum (Mo)-Total	mg/L	0.073	-	0.00005	<0.000050
Nickel (Ni)-Total	mg/L	0.025	0.3	0.0005	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	<0.050
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	<0.00020

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; May 16 and 17, 2013

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	TRIP Trip Blank 5/17/2013
Sulfur (S)-Total	mg/L	-	-	0.5	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010
Uranium (U)-Total	mg/L	-	-	0.00001	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030
Dissolved Metals Filtration Location		-	-	n/a	-
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	-
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	-
Boron (B)-Dissolved	mg/L	-	-	0.01	-
Cadmium (Cd)-Dissolved	mg/L	0.00001	-	0.00001	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	-
Chromium (Cr)-Dissolved	mg/L	0.001	-	0.0001	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	-
Nickel (Ni)-Dissolved	mg/L	0.025	-	0.0005	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	-
Uranium (U)-Dissolved	mg/L	-	-	0.00001	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	-



Appendix B:
ALS Analytical Report



ENVIRONMENTAL DYNAMICS INC.
ATTN: Lyndsay Doetzel
3-478 Range Road
Whitehorse YT Y1A 3A2

Date Received: 17-MAY-13
Report Date: 05-JUN-13 13:01 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1303548
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1, 2, 3, 4, 5, 6, 7, 8
Legal Site Desc:

Comments: Please note we did not receive a bottle for SCN testing for ALS identified sample L1303548-21. Hence, analysis was not completed. Also, ALS identified sample L1303548-18 was sublet to Nautilus Environmental for LT50 Rainbow Trout analysis.

Can Dang
Senior Account Manager

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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	L1303548-1 Water 16-MAY-13 16:40 0167-1305-16-001	L1303548-2 Water 16-MAY-13 16:53 0167-1305-16-002	L1303548-3 Water 16-MAY-13 13:52 0167-1305-16-003	L1303548-4 Water 17-MAY-13 10:16 0167-1305-17-004	L1303548-5 Water 17-MAY-13 08:45 0167-1305-17-005
Grouping	Analyte					
WATER						
Physical Tests	Colour, True (CU)					
	Conductivity (uS/cm)	216	86.2	80.9	70.4	374
	Hardness (as CaCO3) (mg/L)	106	41.7	40.7	37.1	171
	pH (pH)	7.36	7.29	7.29	7.11	7.27
	Total Suspended Solids (mg/L)	123	<3.0	1970	20.1	9.8
	Total Dissolved Solids (mg/L)	188	115	111	116	261
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	26.2	22.9	26.2	15.2	16.1
	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)	26.2	22.9	26.2	15.2	16.1
	Ammonia, Total (as N) (mg/L)	0.0122	<0.0050	0.0319	<0.0050	0.107
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.042	<0.020	0.042	<0.020	0.050
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	0.0129	<0.0050	0.0392
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0015
	Sulfate (SO4) (mg/L)	73.0	15.8	12.3	13.1	155
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)	0.84	1.32	0.86	1.09	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	2.60	0.107	25.2	0.293	0.236
	Antimony (Sb)-Total (mg/L)	0.00498	0.00055	0.00312	0.00039	0.0150
	Arsenic (As)-Total (mg/L)	0.0432	0.00540	0.190	0.00318	0.0484
	Barium (Ba)-Total (mg/L)	0.0619	0.0134	0.581	0.0256	0.00974
	Beryllium (Be)-Total (mg/L)	0.00015	<0.00010	0.00103	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	0.00247	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.016
	Cadmium (Cd)-Total (mg/L)	0.0120	0.000046	0.00361	0.000160	0.00353
	Calcium (Ca)-Total (mg/L)	30.3	11.6	22.1	10.9	53.4
	Chromium (Cr)-Total (mg/L)	0.00342	0.00029	0.0362	0.00035	0.00030
	Cobalt (Co)-Total (mg/L)	0.00164	<0.00010	0.0172	0.00012	0.00069
	Copper (Cu)-Total (mg/L)	0.0199	0.00235	0.0614	0.00420	0.0425
	Iron (Fe)-Total (mg/L)	4.23	0.116	45.1	0.297	0.539
	Lead (Pb)-Total (mg/L)	0.0155	0.000193	0.153	0.000561	0.0201
	Lithium (Li)-Total (mg/L)	0.00250	<0.00050	0.0165	<0.00050	0.00136
	Magnesium (Mg)-Total (mg/L)	7.27	3.01	10.5	2.23	9.50

* 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	L1303548-6 Water 17-MAY-13 09:31 0167-1305-17-006	L1303548-7 Water 17-MAY-13 10:32 0167-1305-17-007	L1303548-8 Water 17-MAY-13 08:24 0167-1305-17-012	L1303548-9 Water 17-MAY-13 08:14 0167-1305-17-013	L1303548-10 Water 16-MAY-13 08:03 0167-1305-16-014
Grouping	Analyte					
WATER						
Physical Tests	Colour, True (CU)					
	Conductivity (uS/cm)	26.1	68.4	1240	<2.0	79.9
	Hardness (as CaCO3) (mg/L)	14.1	37.3	644	<0.50	41.0
	pH (pH)	6.74	7.07	7.73	6.20	7.42
	Total Suspended Solids (mg/L)	18.3	8.2	26.0	<3.0	17.2
	Total Dissolved Solids (mg/L)	79	115	937	<10	62
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.4	13.4	188	1.4	27.3
	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)	8.4	13.4	188	1.4	27.3
	Ammonia, Total (as N) (mg/L)	0.0106	0.0091	3.16	3.64	0.0126
	Chloride (Cl) (mg/L)	<0.50	<0.50	<5.0 ^{DLA}	<0.50	<0.50
	Fluoride (F) (mg/L)	0.022	<0.020	<0.20 ^{DLA}	<0.020	0.031
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	1.10	<0.0050	0.0220
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.021	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	0.56	12.6	507	<0.50	10.6
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	0.0057	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	0.0290	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	0.40	<0.20
	Thiocyanate (SCN) (mg/L)	0.84	1.35	2.96	<0.50	0.92
Total Metals	Aluminum (Al)-Total (mg/L)	0.568	0.311	0.0740	<0.0030	0.888
	Antimony (Sb)-Total (mg/L)	0.00014	0.00028	0.00081	<0.00010	0.00029
	Arsenic (As)-Total (mg/L)	0.00300	0.00281	0.0459	<0.00010	0.00431
	Barium (Ba)-Total (mg/L)	0.0474	0.0272	0.0564	<0.000050	0.0473
	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	0.059	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000052	0.000128	0.000511	<0.000010	0.000122
	Calcium (Ca)-Total (mg/L)	4.22	10.9	192	<0.050	11.2
	Chromium (Cr)-Total (mg/L)	0.00113	0.00032	0.00175	<0.00010	0.00098
	Cobalt (Co)-Total (mg/L)	0.00070	0.00019	0.00606	<0.00010	0.00053
	Copper (Cu)-Total (mg/L)	0.00366	0.00325	0.00838	<0.00050	0.00451
	Iron (Fe)-Total (mg/L)	1.75	0.300	10.3	<0.010	1.20
	Lead (Pb)-Total (mg/L)	0.000359	0.000237	0.000535	<0.000050	0.00207
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00065
	Magnesium (Mg)-Total (mg/L)	0.98	2.20	38.4	<0.10	3.30

* 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	L1303548-11 Water 16-MAY-13 09:50 0167-1305-16-015	L1303548-12 Water 16-MAY-13 15:00 0167-1305-17-017	L1303548-13 Water 16-MAY-13 12:19 0167-1305-16-018	L1303548-14 Water 16-MAY-13 12:19 0167-1305-16-019	L1303548-15 Water 16-MAY-13 12:43 0167-1305-16-020
Grouping	Analyte					
WATER						
Physical Tests	Colour, True (CU)					
	Conductivity (uS/cm)	89.5	54.9	62.8	63.1	59.2
	Hardness (as CaCO3) (mg/L)	48.0	30.1	35.3	34.5	32.8
	pH (pH)	7.50	7.38	7.44	7.43	7.45
	Total Suspended Solids (mg/L)	48.6	114	320	374	155
	Total Dissolved Solids (mg/L)	68	78	87	88	81
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	29.5	23.4	25.0	26.5	24.5
	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)	29.5	23.4	25.0	26.5	24.5
	Ammonia, Total (as N) (mg/L)	0.0128	0.0080	0.0167	0.0153	0.0094
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.030	0.026	0.028	0.028	<0.020
	Nitrate (as N) (mg/L)	0.0305	0.0144	0.0170	0.0169	0.0184
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	13.0	3.08	4.68	4.67	3.46
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)	0.87	0.79	0.93	0.95	0.82
Total Metals	Aluminum (Al)-Total (mg/L)	1.08	2.02	5.44	6.08	2.75
	Antimony (Sb)-Total (mg/L)	0.00035	0.00022	0.00099	0.00107	0.00027
	Arsenic (As)-Total (mg/L)	0.00567	0.00434	0.0269	0.0299	0.00577
	Barium (Ba)-Total (mg/L)	0.0516	0.0678	0.144	0.180	0.101
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	0.00022	0.00028	0.00013
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00051	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000149	0.000156	0.000565	0.000673	0.000217
	Calcium (Ca)-Total (mg/L)	12.2	8.79	11.1	13.7	11.9
	Chromium (Cr)-Total (mg/L)	0.00131	0.00294	0.00725	0.00775	0.00373
	Cobalt (Co)-Total (mg/L)	0.00071	0.00133	0.00352	0.00388	0.00179
	Copper (Cu)-Total (mg/L)	0.00532	0.00695	0.0136	0.0163	0.00928
	Iron (Fe)-Total (mg/L)	1.54	3.02	8.36	8.87	3.97
	Lead (Pb)-Total (mg/L)	0.00345	0.00383	0.0206	0.0262	0.00519
	Lithium (Li)-Total (mg/L)	0.00129	0.00162	0.00406	0.00441	0.00218
	Magnesium (Mg)-Total (mg/L)	3.68	2.98	4.18	4.94	4.00

* 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	L1303548-16 Water 16-MAY-13 16:28 0167-1305-16-021	L1303548-17 Water 17-MAY-13 10:21 0167-1305-17-022	L1303548-18 Water 17-MAY-13 08:24 0167-1305-17-023	L1303548-19 Water 17-MAY-13 07:59 0167-1305-17-026	L1303548-20 Water 17-MAY-13 09:03 0167-1305-17-030
Grouping	Analyte					
WATER						
Physical Tests	Colour, True (CU)					<5.0
	Conductivity (uS/cm)	1180	76.2	1230	400	402
	Hardness (as CaCO3) (mg/L)	706	41.3	647	213	220
	pH (pH)	7.88	7.01	7.82	7.83	8.26
	Total Suspended Solids (mg/L)	74.8	10.7	21.6	21.2	
	Total Dissolved Solids (mg/L)	891	118	863	307	234
	Turbidity (NTU)					0.45
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	258	14.0	182	59.1	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Total (as CaCO3) (mg/L)	258	14.0	182	59.1	197
	Ammonia, Total (as N) (mg/L)	0.0870	0.0113	3.43	0.181	
	Chloride (Cl) (mg/L)	<5.0 ^{DLA}	<0.50	<5.0 ^{DLA}	<0.50	<0.50
	Fluoride (F) (mg/L)	<0.20 ^{DLA}	<0.020	<0.20 ^{DLA}	0.047	0.094
	Nitrate (as N) (mg/L)	<0.050 ^{DLA}	<0.0050	1.12	0.147	0.147
	Nitrite (as N) (mg/L)	<0.010 ^{DLA}	<0.0010	0.031	0.0017	<0.0010
	Sulfate (SO4) (mg/L)	447	15.8	520	139	40.7
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	0.0050	<0.0050	
	Cyanide, Total (mg/L)	<0.0050	<0.0050	0.0276	<0.0050	
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	
	Thiocyanate (SCN) (mg/L)	<0.50	1.46	2.67	0.80	
Total Metals	Aluminum (Al)-Total (mg/L)	1.37	0.468	0.0822	0.407	<0.010
	Antimony (Sb)-Total (mg/L)	0.0335	0.00107	0.00086	0.00147	<0.00050
	Arsenic (As)-Total (mg/L)	0.224	0.00887	0.0498	0.0104	0.00039
	Barium (Ba)-Total (mg/L)	0.0468	0.0306	0.0600	0.0332	0.096
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Bismuth (Bi)-Total (mg/L)	0.00101	<0.00050	<0.00050	<0.00050	
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.068	0.015	<0.10
	Cadmium (Cd)-Total (mg/L)	0.00556	0.000476	0.000568	0.000506	<0.00020
	Calcium (Ca)-Total (mg/L)	207	13.8	215	52.8	50.9
	Chromium (Cr)-Total (mg/L)	0.00182	0.00054	0.00055	0.00055	<0.0020
	Cobalt (Co)-Total (mg/L)	0.00272	0.00021	0.00681	0.00081	
	Copper (Cu)-Total (mg/L)	0.0151	0.0104	0.00893	0.00514	<0.0010
	Iron (Fe)-Total (mg/L)	6.71	0.600	11.6	1.74	<0.030
	Lead (Pb)-Total (mg/L)	0.103	0.00411	0.000609	0.00448	0.00064
	Lithium (Li)-Total (mg/L)	0.0114	<0.00050	0.00080	0.00123	
	Magnesium (Mg)-Total (mg/L)	67.7	2.96	41.6	17.0	22.7

* 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				
	L1303548-21 Water 17-MAY-13 15:08 TRIP BLANK				
Grouping	Analyte				
WATER					
Physical Tests	Colour, True (CU)				
	Conductivity (uS/cm)	<2.0			
	Hardness (as CaCO3) (mg/L)				
	pH (pH)	5.98			
	Total Suspended Solids (mg/L)	<3.0			
	Total Dissolved Solids (mg/L)	<10			
	Turbidity (NTU)				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<1.0			
	Ammonia, Total (as N) (mg/L)	<0.0050			
	Chloride (Cl) (mg/L)	<0.50			
	Fluoride (F) (mg/L)	<0.020			
	Nitrate (as N) (mg/L)	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010			
	Sulfate (SO4) (mg/L)	<0.50			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050			
	Cyanide, Total (mg/L)	<0.0050			
	Cyanate (mg/L)	0.27			
	Thiocyanate (SCN) (mg/L)				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030			
	Antimony (Sb)-Total (mg/L)	<0.00010			
	Arsenic (As)-Total (mg/L)	<0.00010			
	Barium (Ba)-Total (mg/L)	<0.000050			
	Beryllium (Be)-Total (mg/L)	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.00050			
	Boron (B)-Total (mg/L)	<0.010			
	Cadmium (Cd)-Total (mg/L)	<0.000010			
	Calcium (Ca)-Total (mg/L)	<0.050			
	Chromium (Cr)-Total (mg/L)	<0.00010			
	Cobalt (Co)-Total (mg/L)	<0.00010			
	Copper (Cu)-Total (mg/L)	<0.00050			
	Iron (Fe)-Total (mg/L)	<0.010			
	Lead (Pb)-Total (mg/L)	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.00050			
	Magnesium (Mg)-Total (mg/L)	<0.10			

* 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	L1303548-1	L1303548-2	L1303548-3	L1303548-4	L1303548-5
					L1303548-1 Water 16-MAY-13 16:40 0167-1305-16-001	L1303548-2 Water 16-MAY-13 16:53 0167-1305-16-002	L1303548-3 Water 16-MAY-13 13:52 0167-1305-16-003	L1303548-4 Water 17-MAY-13 10:16 0167-1305-17-004	L1303548-5 Water 17-MAY-13 08:45 0167-1305-17-005
Grouping	Analyte								
WATER									
Total Metals	Manganese (Mn)-Total (mg/L)	0.437	0.0142	1.81	0.0142	0.901			
	Mercury (Hg)-Total (mg/L)	0.000032	0.000013	0.000087	0.000014	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.000129	<0.000050	0.00183	0.000056	0.000424			
	Nickel (Ni)-Total (mg/L)	0.00423	<0.00050	0.0260	0.00101	0.00143			
	Phosphorus (P)-Total (mg/L)	0.162	<0.050	1.62	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	3.12	3.58	4.84	1.35	2.22			
	Selenium (Se)-Total (mg/L)	0.00012	<0.00010	0.00024	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	6.24	2.46	43.2	2.15	1.23			
	Silver (Ag)-Total (mg/L)	0.000349	0.000040	0.00149	0.000036	0.000346			
	Sodium (Na)-Total (mg/L)	0.891	0.575	2.41	0.878	2.42			
	Strontium (Sr)-Total (mg/L)	0.0697	0.0387	0.158	0.0733	0.119			
	Sulfur (S)-Total (mg/L)	23.6	5.64	4.37	4.72	51.7			
	Thallium (Tl)-Total (mg/L)	0.000108	<0.000010	0.000460	<0.000010	0.000050			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00044	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.106	<0.010	0.845	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	0.000434	0.000021	0.00360	0.000108	0.000201			
	Vanadium (V)-Total (mg/L)	0.0092	<0.0010	0.0766	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	1.19	0.0059	0.336	0.0162	0.382			
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.206	0.0983	0.167	0.257	0.0637			
	Antimony (Sb)-Dissolved (mg/L)	0.00227	0.00057	0.00026	0.00033	0.0116			
	Arsenic (As)-Dissolved (mg/L)	0.00715	0.00522	0.00319	0.00246	0.0202			
	Barium (Ba)-Dissolved (mg/L)	0.0285	0.0137	0.0278	0.0250	0.00769			
	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	0.012			
	Cadmium (Cd)-Dissolved (mg/L)	0.0110	0.000042	0.000168	0.000115	0.00325			
	Calcium (Ca)-Dissolved (mg/L)	31.0	11.7	12.0	11.1	52.9			
	Chromium (Cr)-Dissolved (mg/L)	0.00020	0.00020	0.00025	0.00025	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	0.00040	<0.00010	0.00035	<0.00010	0.00062			
	Copper (Cu)-Dissolved (mg/L)	0.0143	0.00215	0.00476	0.00354	0.0347			
	Iron (Fe)-Dissolved (mg/L)	0.198	0.105	0.349	0.247	0.186			
	Lead (Pb)-Dissolved (mg/L)	0.000729	0.000080	0.000998	0.000155	0.00398			
	Lithium (Li)-Dissolved (mg/L)	0.00086	<0.00050	<0.00050	<0.00050	0.00089			
	Magnesium (Mg)-Dissolved (mg/L)	6.92	3.04	2.58	2.27	9.41			
	Manganese (Mn)-Dissolved (mg/L)	0.376	0.0135	0.128	0.00728	0.865			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	0.000014	<0.000010	0.000013	<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	L1303548-6 Water 17-MAY-13 09:31 0167-1305-17-006	L1303548-7 Water 17-MAY-13 10:32 0167-1305-17-007	L1303548-8 Water 17-MAY-13 08:24 0167-1305-17-012	L1303548-9 Water 17-MAY-13 08:14 0167-1305-17-013	L1303548-10 Water 16-MAY-13 08:03 0167-1305-16-014
Grouping	Analyte					
WATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.159	0.0416	4.21	<0.000050	0.103
	Mercury (Hg)-Total (mg/L)	0.000016	0.000014	<0.000010	<0.000010	0.000013
	Molybdenum (Mo)-Total (mg/L)	0.000172	0.000051	0.00101	<0.000050	0.000251
	Nickel (Ni)-Total (mg/L)	0.00193	0.00098	0.00215	<0.00050	0.00148
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	1.28	1.35	4.99	<0.10	1.47
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	0.00020	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	2.52	2.16	5.68	<0.050	3.76
	Silver (Ag)-Total (mg/L)	0.000010	0.000027	0.000056	<0.000010	0.000040
	Sodium (Na)-Total (mg/L)	0.624	0.861	29.2	<0.050	1.06
	Strontium (Sr)-Total (mg/L)	0.0200	0.0700	0.579	<0.00020	0.0881
	Sulfur (S)-Total (mg/L)	0.52	4.56	170	<0.50	3.76
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000011	<0.000010	0.000016
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.016	<0.010	<0.010	<0.010	0.035
	Uranium (U)-Total (mg/L)	0.000118	0.000101	0.00203	<0.000010	0.000288
	Vanadium (V)-Total (mg/L)	0.0031	<0.0010	0.0016	<0.0010	0.0021
	Zinc (Zn)-Total (mg/L)	0.0084	0.0141	0.0120	<0.0030	0.0131
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.184	0.288	0.0309	<0.0010	0.144
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00029	0.00063	<0.00010	0.00015
	Arsenic (As)-Dissolved (mg/L)	0.00228	0.00261	0.0317	<0.00010	0.00141
	Barium (Ba)-Dissolved (mg/L)	0.0384	0.0270	0.0531	<0.000050	0.0382
	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	0.055	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000021	0.000119	0.000358	<0.000010	0.000074
	Calcium (Ca)-Dissolved (mg/L)	4.15	11.2	194	<0.050	11.2
	Chromium (Cr)-Dissolved (mg/L)	0.00035	0.00028	0.00035	<0.00010	0.00012
	Cobalt (Co)-Dissolved (mg/L)	0.00054	0.00017	0.00589	<0.00010	0.00027
	Copper (Cu)-Dissolved (mg/L)	0.00256	0.00304	0.00439	<0.00020	0.00356
	Iron (Fe)-Dissolved (mg/L)	1.22	0.269	8.60	<0.010	0.371
	Lead (Pb)-Dissolved (mg/L)	0.000105	0.000176	0.000098	<0.000050	0.000150
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)	0.91	2.28	38.8	<0.10	3.18
	Manganese (Mn)-Dissolved (mg/L)	0.149	0.0400	4.08	<0.000050	0.0778
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	0.000012	<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	L1303548-11	L1303548-12	L1303548-13	L1303548-14	L1303548-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	16-MAY-13	16-MAY-13	16-MAY-13	16-MAY-13	16-MAY-13
		Sampled Time	09:50	15:00	12:19	12:19	12:43
		Client ID	0167-1305-16-015	0167-1305-17-017	0167-1305-16-018	0167-1305-16-019	0167-1305-16-020
Grouping	Analyte						
WATER							
Total Metals	Manganese (Mn)-Total (mg/L)		0.112	0.0974	0.308	0.356	0.133
	Mercury (Hg)-Total (mg/L)		0.000014	0.000013	0.000025	0.000020	0.000013
	Molybdenum (Mo)-Total (mg/L)		0.000296	0.000289	0.000598	0.000654	0.000311
	Nickel (Ni)-Total (mg/L)		0.00161	0.00257	0.00552	0.00616	0.00334
	Phosphorus (P)-Total (mg/L)		0.072	0.127	0.405	0.471	0.207
	Potassium (K)-Total (mg/L)		1.52	1.42	2.21	2.46	1.81
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	<0.00010	0.00010	<0.00010
	Silicon (Si)-Total (mg/L)		4.09	4.93	11.2	12.1	6.58
	Silver (Ag)-Total (mg/L)		0.000056	0.000056	0.000215	0.000234	0.000060
	Sodium (Na)-Total (mg/L)		1.16	0.880	3.17	1.45	1.17
	Strontium (Sr)-Total (mg/L)		0.0970	0.0925	0.114	0.138	0.123
	Sulfur (S)-Total (mg/L)		4.61	1.30	1.96	2.27	1.86
	Thallium (Tl)-Total (mg/L)		0.000020	0.000024	0.000091	0.000104	0.000034
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	0.00013	0.00014	<0.00010
	Titanium (Ti)-Total (mg/L)		0.043	0.089	0.226	0.244	0.127
	Uranium (U)-Total (mg/L)		0.000333	0.000545	0.000907	0.00119	0.000716
	Vanadium (V)-Total (mg/L)		0.0028	0.0060	0.0157	0.0178	0.0081
	Zinc (Zn)-Total (mg/L)		0.0166	0.0189	0.0571	0.0646	0.0250
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.147	0.149	0.158	0.156	0.156
	Antimony (Sb)-Dissolved (mg/L)		0.00017	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)		0.00122	0.00032	0.00069	0.00066	0.00035
	Barium (Ba)-Dissolved (mg/L)		0.0365	0.0340	0.0328	0.0345	0.0348
	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)		0.000088	0.000046	0.000063	0.000066	0.000045
	Calcium (Ca)-Dissolved (mg/L)		13.0	8.12	9.66	9.40	8.85
	Chromium (Cr)-Dissolved (mg/L)		0.00015	0.00017	0.00016	0.00010	0.00016
	Cobalt (Co)-Dissolved (mg/L)		0.00019	0.00017	0.00018	0.00018	0.00016
	Copper (Cu)-Dissolved (mg/L)		0.00353	0.00335	0.00366	0.00357	0.00339
	Iron (Fe)-Dissolved (mg/L)		0.253	0.199	0.223	0.215	0.201
	Lead (Pb)-Dissolved (mg/L)		0.000152	<0.000050	0.000162	0.000162	<0.000050
	Lithium (Li)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)		3.78	2.39	2.73	2.67	2.60
	Manganese (Mn)-Dissolved (mg/L)		0.0658	0.0326	0.0399	0.0382	0.0260
	Mercury (Hg)-Dissolved (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	L1303548-16	L1303548-17	L1303548-18	L1303548-19	L1303548-20
		Description	Water	Water	Water	Water	Water
		Sampled Date	16-MAY-13	17-MAY-13	17-MAY-13	17-MAY-13	17-MAY-13
		Sampled Time	16:28	10:21	08:24	07:59	09:03
		Client ID	0167-1305-16-021	0167-1305-17-022	0167-1305-17-023	0167-1305-17-026	0167-1305-17-030
Grouping	Analyte						
WATER							
Total Metals	Manganese (Mn)-Total (mg/L)		2.35	0.0346	4.67	0.601	<0.0020
	Mercury (Hg)-Total (mg/L)		0.000012	0.000014	<0.000010	<0.000010	<0.00020
	Molybdenum (Mo)-Total (mg/L)		0.000515	0.000091	0.00116	0.000211	
	Nickel (Ni)-Total (mg/L)		0.00408	0.00128	0.00246	0.00152	
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)		4.36	1.70	5.86	2.29	0.90
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	0.00020	<0.00010	<0.0010
	Silicon (Si)-Total (mg/L)		9.25	2.70	6.24	2.72	
	Silver (Ag)-Total (mg/L)		0.00173	0.000094	0.000059	0.000034	
	Sodium (Na)-Total (mg/L)		5.22	1.03	32.8	3.25	5.3
	Strontium (Sr)-Total (mg/L)		0.483	0.0906	0.672	0.162	
	Sulfur (S)-Total (mg/L)		168	6.43	189	47.3	
	Thallium (Tl)-Total (mg/L)		0.000212	0.000016	0.000010	<0.000010	
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Total (mg/L)		0.063	<0.010	<0.010	0.013	
	Uranium (U)-Total (mg/L)		0.00427	0.000142	0.00238	0.000544	0.00241
	Vanadium (V)-Total (mg/L)		0.0057	<0.0010	0.0018	0.0014	
	Zinc (Zn)-Total (mg/L)		1.39	0.0453	0.0135	0.0924	<0.050
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0020	0.252	0.0335	0.155	
	Antimony (Sb)-Dissolved (mg/L)		0.0148	0.00050	0.00062	0.00136	
	Arsenic (As)-Dissolved (mg/L)		0.0800	0.00288	0.0323	0.00629	
	Barium (Ba)-Dissolved (mg/L)		0.0197	0.0232	0.0516	0.0291	
	Beryllium (Be)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)		<0.010	<0.010	0.056	0.013	
	Cadmium (Cd)-Dissolved (mg/L)		0.00222	0.000337	0.000364	0.000381	
	Calcium (Ca)-Dissolved (mg/L)		184	12.2	196	55.7	
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	0.00022	0.00036	0.00015	
	Cobalt (Co)-Dissolved (mg/L)		0.00158	<0.00010	0.00602	0.00072	
	Copper (Cu)-Dissolved (mg/L)		0.00056	0.00720	0.00455	0.00378	
	Iron (Fe)-Dissolved (mg/L)		2.48	0.255	8.82	1.12	
	Lead (Pb)-Dissolved (mg/L)		0.000610	0.000691	0.000093	0.000369	
	Lithium (Li)-Dissolved (mg/L)		0.0100	<0.00050	0.00052	0.00110	
	Magnesium (Mg)-Dissolved (mg/L)		60.1	2.61	38.1	18.0	
	Manganese (Mn)-Dissolved (mg/L)		1.91	0.0147	4.14	0.621	
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	0.000012	<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				
	L1303548-21 Water 17-MAY-13 15:08 TRIP BLANK				
Grouping	Analyte				
WATER					
Total Metals	Manganese (Mn)-Total (mg/L)	<0.000050			
	Mercury (Hg)-Total (mg/L)	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.000050			
	Nickel (Ni)-Total (mg/L)	<0.000050			
	Phosphorus (P)-Total (mg/L)	<0.050			
	Potassium (K)-Total (mg/L)	<0.10			
	Selenium (Se)-Total (mg/L)	<0.00010			
	Silicon (Si)-Total (mg/L)	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000010			
	Sodium (Na)-Total (mg/L)	<0.050			
	Strontium (Sr)-Total (mg/L)	<0.00020			
	Sulfur (S)-Total (mg/L)	<0.50			
	Thallium (Tl)-Total (mg/L)	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010			
	Titanium (Ti)-Total (mg/L)	<0.010			
	Uranium (U)-Total (mg/L)	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0030			
Dissolved Metals	Dissolved Metals Filtration Location				
	Aluminum (Al)-Dissolved (mg/L)				
	Antimony (Sb)-Dissolved (mg/L)				
	Arsenic (As)-Dissolved (mg/L)				
	Barium (Ba)-Dissolved (mg/L)				
	Beryllium (Be)-Dissolved (mg/L)				
	Bismuth (Bi)-Dissolved (mg/L)				
	Boron (B)-Dissolved (mg/L)				
	Cadmium (Cd)-Dissolved (mg/L)				
	Calcium (Ca)-Dissolved (mg/L)				
	Chromium (Cr)-Dissolved (mg/L)				
	Cobalt (Co)-Dissolved (mg/L)				
	Copper (Cu)-Dissolved (mg/L)				
	Iron (Fe)-Dissolved (mg/L)				
	Lead (Pb)-Dissolved (mg/L)				
	Lithium (Li)-Dissolved (mg/L)				
	Magnesium (Mg)-Dissolved (mg/L)				
	Manganese (Mn)-Dissolved (mg/L)				
	Mercury (Hg)-Dissolved (mg/L)				

* 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	L1303548-1	L1303548-2	L1303548-3	L1303548-4	L1303548-5
					Water	Water	Water	Water	Water
		16-MAY-13	16:40	0167-1305-16-001	16-MAY-13	16-MAY-13	16-MAY-13	17-MAY-13	17-MAY-13
					16:40	16:53	13:52	10:16	08:45
					0167-1305-16-001	0167-1305-16-002	0167-1305-16-003	0167-1305-17-004	0167-1305-17-005
Grouping	Analyte								
WATER									
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.000054	<0.000050	0.000514	<0.000050	0.000332			
	Nickel (Ni)-Dissolved (mg/L)	0.00250	<0.00050	0.00117	0.00095	0.00128			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	2.92	3.60	1.15	1.39	2.13			
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
	Silicon (Si)-Dissolved (mg/L)	2.66	2.46	2.34	2.13	0.837			
	Silver (Ag)-Dissolved (mg/L)	0.000032	0.000034	0.000025	0.000024	0.000054			
	Sodium (Na)-Dissolved (mg/L)	0.799	0.554	0.987	0.876	2.37			
	Strontium (Sr)-Dissolved (mg/L)	0.0638	0.0352	0.0730	0.0749	0.104			
	Sulfur (S)-Dissolved (mg/L)	24.5	5.61	4.37	4.73	50.6			
	Thallium (Tl)-Dissolved (mg/L)	0.000013	<0.000010	<0.000010	<0.000010	0.000038			
	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)	0.000278	0.000020	0.000403	0.000102	0.000163			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	1.16	0.0045	0.0050	0.0146	0.367			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1303548-6	L1303548-7	L1303548-8	L1303548-9	L1303548-10	
Description	Water	Water	Water	Water	Water	
Sampled Date	17-MAY-13	17-MAY-13	17-MAY-13	17-MAY-13	16-MAY-13	
Sampled Time	09:31	10:32	08:24	08:14	08:03	
Client ID	0167-1305-17-006	0167-1305-17-007	0167-1305-17-012	0167-1305-17-013	0167-1305-16-014	
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.000144	<0.000050	0.000954	<0.000050	0.000192
	Nickel (Ni)-Dissolved (mg/L)	0.00160	0.00093	0.00199	<0.00050	0.00106
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.26	1.42	5.09	<0.10	1.31
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	0.00019	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	1.82	2.18	5.60	<0.050	2.33
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000021	0.000016	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	0.618	0.859	27.7	<0.050	0.979
	Strontium (Sr)-Dissolved (mg/L)	0.0191	0.0738	0.553	<0.00020	0.0871
	Sulfur (S)-Dissolved (mg/L)	<0.50	4.64	167	<0.50	3.74
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000012	<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)	0.000069	0.000104	0.00211	<0.000010	0.000230
	Vanadium (V)-Dissolved (mg/L)	0.0014	<0.0010	0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0050	0.0141	0.0102	<0.0010	0.0064

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1303548-11	L1303548-12	L1303548-13	L1303548-14	L1303548-15	
Description	Water	Water	Water	Water	Water	
Sampled Date	16-MAY-13	16-MAY-13	16-MAY-13	16-MAY-13	16-MAY-13	
Sampled Time	09:50	15:00	12:19	12:19	12:43	
Client ID	0167-1305-16-015	0167-1305-17-017	0167-1305-16-018	0167-1305-16-019	0167-1305-16-020	
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.000198	0.000132	0.000174	0.000174	0.000143
	Nickel (Ni)-Dissolved (mg/L)	0.00090	0.00080	0.00089	0.00088	0.00083
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.47	1.16	1.34	1.21	1.22
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	2.61	2.14	2.45	2.29	2.27
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.07	0.736	0.854	0.847	0.802
	Strontium (Sr)-Dissolved (mg/L)	0.103	0.0835	0.0886	0.0853	0.0904
	Sulfur (S)-Dissolved (mg/L)	4.92	1.28	1.97	1.85	1.42
	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)	0.000266	0.000214	0.000237	0.000243	0.000208
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0068	0.0030	0.0047	0.0038	0.0039

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1303548-16	L1303548-17	L1303548-18	L1303548-19	L1303548-20
Description	Water	Water	Water	Water	Water
Sampled Date	16-MAY-13	17-MAY-13	17-MAY-13	17-MAY-13	17-MAY-13
Sampled Time	16:28	10:21	08:24	07:59	09:03
Client ID	0167-1305-16-021	0167-1305-17-022	0167-1305-17-023	0167-1305-17-026	0167-1305-17-030
Grouping	Analyte				
WATER					
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.000358	<0.000050	0.000975	0.000184
	Nickel (Ni)-Dissolved (mg/L)	0.00245	0.00098	0.00202	0.00118
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.45	1.48	5.30	2.32
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	0.00021	<0.00010
	Silicon (Si)-Dissolved (mg/L)	5.98	2.17	5.49	2.41
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000023	0.000015	<0.000010
	Sodium (Na)-Dissolved (mg/L)	4.39	0.896	29.5	3.39
	Strontium (Sr)-Dissolved (mg/L)	0.454	0.0786	0.585	0.168
	Sulfur (S)-Dissolved (mg/L)	146	5.57	167	48.4
	Thallium (Tl)-Dissolved (mg/L)	0.000091	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00377	0.000099	0.00205	0.000551
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	1.09	0.0335	0.0116	0.0873

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1303548-21			
	Description	Water			
	Sampled Date	17-MAY-13			
	Sampled Time	15:08			
	Client ID	TRIP BLANK			
Grouping	Analyte				
WATER					
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)				
	Nickel (Ni)-Dissolved (mg/L)				
	Phosphorus (P)-Dissolved (mg/L)				
	Potassium (K)-Dissolved (mg/L)				
	Selenium (Se)-Dissolved (mg/L)				
	Silicon (Si)-Dissolved (mg/L)				
	Silver (Ag)-Dissolved (mg/L)				
	Sodium (Na)-Dissolved (mg/L)				
	Strontium (Sr)-Dissolved (mg/L)				
	Sulfur (S)-Dissolved (mg/L)				
	Thallium (Tl)-Dissolved (mg/L)				
	Tin (Sn)-Dissolved (mg/L)				
	Titanium (Ti)-Dissolved (mg/L)				
	Uranium (U)-Dissolved (mg/L)				
	Vanadium (V)-Dissolved (mg/L)				
	Zinc (Zn)-Dissolved (mg/L)				

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Sulfate (SO4)	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Fluoride (F)	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1303548-11, -12, -13, -14, -15, -16, -17, -18, -19
Matrix Spike	Manganese (Mn)-Total	MS-B	L1303548-11, -12, -13, -14, -15, -16, -17, -18, -19
Matrix Spike	Sodium (Na)-Total	MS-B	L1303548-11, -12, -13, -14, -15, -16, -17, -18, -19
Matrix Spike	Strontium (Sr)-Total	MS-B	L1303548-11, -12, -13, -14, -15, -16, -17, -18, -19
Matrix Spike	Mercury (Hg)-Total	MS-B	L1303548-20
Matrix Spike	Copper (Cu)-Total	MS-B	L1303548-20
Matrix Spike	Potassium (K)-Total	MS-B	L1303548-20
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1303548-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
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-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			

Reference Information

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-T-CFA-VA Water Total Cyanide in water by CFA ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-VA Water Weak Acid Diss. Cyanide in water by CFA APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

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 (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 (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 (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 -

Reference Information

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

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.

Reference Information

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
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1	2	3	4	5
6	7	8		

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Nautilus Environmental

8664 Commerce Court, Burnaby, BC V5A 4N7

WO#: 13285

Mr. Can Dang
ALS Environmental
Suite 100-8081 Lougheed Hwy.
Burnaby, BC
V5A 1W9

June 5, 2013

Dear Mr. Dang:

Re: Toxicity testing on the sample identified as L1303548-18 [Collected on May 17, 2013]

Nautilus Environmental is pleased to provide you the results of the 96-h LT50 rainbow trout toxicity test on the above sample, received on May 21, 2013. Testing was conducted according to Environment Canada 1/RM/13, (Second Edition, 2000, including May 2007 amendments). The result of this test is provided in the table below and is based on the appended data. All acceptability criteria outlined in the Environment Canada protocol were met.

Table A. Result for the 96-h rainbow trout LT50 test.

Sample ID	Collection Date and Time	96-h LT50 (hours) ¹
L1303548-18	May 17 2013 @ N/A	>96

¹ Results relate only to the sample tested.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

Nautilus Environmental

Jacob Frank, B.Sc.
Laboratory Biologist

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: May 22/13 @ 0900

Work Order No.: 13285

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: L1303548-18

Sample Date: May 17/13 @ N/A

Date Received: May 21/13 @ 1300

Sample Volume: 1 x 20L

Other: N/A

Test Validity Criteria:

≥ 90% control survival

WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water

Hardness (mg/L CaCO₃): 11

Alkalinity (mg/L CaCO₃): 10

Test Organism Information:

Batch No.: 043013

Source: Miracle Spings

No. Fish/Volume (L): 10/12L

Loading Density: 0.47

Mean Length ± SD (mm): 39 ± 3

Range: 34 - 44

Mean Weight ± SD (g): 0.57 ± 0.09

Range: 0.39 - 0.72

NaNO₂ Reference Toxicant Results:

Reference Toxicant ID: RTNt38

Stock Solution ID: 13Nt01

Date Initiated: May 14/13

96-h LC₅₀ (95% CL): 3.1 (2.4 - 3.9) mg/L NaNO₂

Reference Toxicant Mean and Historical Range: 5.1 (2.8 - 9.2) mg/L NaNO₂

Reference Toxicant CV (%): 35

Test Results: The 96-h LT50 is > 96-hours.

Reviewed by: A. Terry

Date reviewed: June 3, 2013

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
 Sample I.D.: L1303548-18
 W.O. #: 13285
 RBT Batch #: 043013
 Date Collected/Time: May 17 113 @ N/A
 Date Setup/Time: May 22 113 @ 0900
 Sample Setup By: SBF

Number Fish/Volume: 10/12
 7-d % Mortality: 0.08
 Total Pre-aeration Time (mins): 30
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

D.O. meter: DO- 1/2
 pH meter: pH- 1/2
 Cond. Meter: C- 1/2

Undiluted Sample WQ		
Parameters	Initial WQ	Adjustment
Temp °C	14.5	14.0
pH	6.8	6.9
D.O. (mg/L)	6.3	9.0
Cond. (µS/cm)	1238	1246

Concentration (% v/v)	# Survivors										Temperature (°C)						Dissolved Oxygen (mg/L)						pH						Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96	
CONT	10	10	10	10	10	10	10	14.5	14.0	14.0	14.0	14.0	10.1	10.0	9.5	9.9	9.9	9.9	7.0	7.2	7.1	7.1	7.1	31	31	31	31	31	31	31
100	10	10	10	10	10	10	10	14.0	14.0	14.0	14.0	14.0	9.0	9.9	9.6	9.8	9.8	6.9	8.1	8.1	7.9	7.9	7.9	1246	1246	1246	1246	1246	1246	1246
Initials	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF	SBF

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Orange, turbid
 Fish Description at 96? all look ok

Other Observations: _____
 Reviewed by: A. Berg Date Reviewed: June 3, 2013



L1303548

VANCOUVER

Short Holding Time
Rush Processing

Subcontract To:

NAUTILUS ENVIRONMENTAL

8664 COMMERCE COURT
BURNABY, BC V5A 4N7

NOTES: Please reference on final report and invoice: PO# L1303548
ALS requires QC data to be provided with your final results.

Rainbow Trout LT50

WO: 13285

Please see enclosed 1 sample(s) in 1 Container(s)

SAMPLE NUMBER	CLIENT ID	ANALYTICAL REQUIRED	DATE SAMPLED	PRIORITY FLAG
L1303548-18	0167-1305-17-023	Special Request- Nautilus Environmental (SPECIAL REQUEST-NL 14)	5/17/2013 7/28/2013	

Subcontract Info Contact: Dorota Jamro (604) 253-4188
 Analysis and reporting info contact: Can Dang
 8081 LOUGHEED HWY
 SUITE 100
 BURNABY, BC V5A 1W9
 Phone: (604) 253-4188 Email: can.dang@alsglobal.com

Please email confirmation of receipt to: can.dang@alsglobal.com

Shipped By: _____ Date Shipped: _____
 Received By: Jacob Frank Date Received: May 21/13 @ 1300
 Verified By: _____ Date Verified: _____
 Temperature: 5.6

Sample Integrity Issues: _____

Report To	Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company: EDI	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)
Contact: Lindsay Doetzel	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax	<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address: 3-478 Range Road Y1A #a2	Email 1: ldoetzel@edynamics.com	<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
Phone: 867-393-4882 Fax:	Email 2:	<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone: 867-393-4882 Fax:	Email 3:	Analysis Request

Invoice To Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No	Client / Project Information	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Job #: Mount Nansen 13-Y-0167	
Contact:	PO / AFE:	
Address:	LSD:	
Phone: Fax:	Quote #: Q38399	

Lab Work Order # _____ (lab use only)	ALS Contact: _____ Sampler: JM	
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers
0167-1305 16 -001		16-MAY-13	16:40	Water	X	X	X	X	X	X	X	X	X	X		6	
0167-1305 16 -002		16-MAY-13	16:53	Water	X	X	X	X	X	X	X	X	X	X		6	
0167-1305 16 -003		16-MAY-13	13:52	Water	X	X	X	X	X	X	X	X	X	X		6	
0167-1305 -004				Water												6	
0167-1305 -005				Water												6	
0167-1305 -006				Water												6	
0167-1305 -007				Water												6	
0167-1305 -008				Water												6	
0167-1305 -009				Water												6	
0167-1305 -010				Water												6	
0167-1305 -011				Water												6	
0167-1305 -012				Water												6	

Short Holding Time
Rush Processing



Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 tab.
 Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)				
Released by: [Signature]	Date (dd-mmm-yy):	Time (hh-mm):	Received by: [Signature]	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

[Signature] May 21 10:05 ① 4.6° ② 5.1° ③ 4.0°



Report To		Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)													
Company: EDI		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)													
Contact: Lindsay Doetzel		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT													
Address: 3-478 Range Road Y1A #a2		Email 1: ldoetzel@edynamics.com			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT													
Phone: 867-393-4882 Fax:		Email 2:			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT													
Invoice To Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		Client / Project Information			Analysis Request													
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		Job #: Mount Nansen 13-Y-0167			Please indicate below Filtered, Preserved or both (F, P, F/P)													
Company:		PO / AFE:					P	P	P	P		F/P	P	P				
Contact:		LSD:																
Address:		Quote #: Q38399																
Phone: Fax:		ALS Contact:			ALP-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50		
Lab Work Order # (lab use only)		Sampler:														Number of Containers		
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALP-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers
	0167-1305	-001			Water													6
	0167-1305	-002			Water													6
	0167-1305	-003			Water													6
	0167-1305	17-004	17-MAY-13	10:16	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305	17-005	17-MAY-13	8:45	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305	-006			Water													6
	0167-1305	17-007	17-MAY-13	10:32	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305	-008			Water													6
	0167-1305	-009			Water													6
	0167-1305	-010			Water													6
	0167-1305	-011			Water													6
	0167-1305	17-012	17-MAY-13	8:24	Water													6



Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/...

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 tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
<i>[Signature]</i>	17-MAY-13	12:00				°C				Yes / No ? If Yes add SIF



Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)												
Company: EDI		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)												
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Address: 3-478 Range Road Y1A #a2		Email 1: ldoetzel@edynamics.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT												
Phone: 867-393-4882 Fax: _____		Email 2: _____		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Invoice To Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		Client / Project Information		Analysis Request												
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		Job #: Mount Nansen 13-Y-0167		Please indicate below Filtered, Preserved or both (F, P, F/P)												
Company: _____		PO / AFE: _____				P	P	P	P		F/P	P	P			
Contact: _____		LSD: _____														
Address: _____		Quote #: Q38399														
Phone: _____ Fax: _____		ALS Contact: _____														
Lab Work Order # (lab use only)		Sampler: _____		ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR, PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA, TSS-VA	Rainbow Trout LT50	Number of Containers
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type											
	0167-1305	-001			Water											6
	0167-1305	-002			Water											6
	0167-1305	-003			Water											6
	0167-1305	-004			Water											6
	0167-1305	-005			Water											6
	0167-1305	17-006	17-MAY-13	9:31	Water	X	X	X	X	X	X	X	X	X	X	6
	0167-1305	-007			Water											6
	0167-1305	-008			Water											6
	0167-1305	-009			Water											6
	0167-1305	-010			Water											6
	0167-1305	-011			Water											6
	0167-1305	-012			Water											6

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details



L1303548-COFC

Failure to complete all portions of this form may delay analysis. Please fill in this
 By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided
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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: <i>L. Doetzel</i>	Date (dd-mmm-yy): 17-MAY-13	Time (hh:mm): 12:00	Received by: _____	Date: _____	Time: _____	Temperature: _____ °C	Verified by: _____	Date: _____	Time: _____	Observations: Yes / No? If Yes add SIF

Report To	Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)																																																																																																																																		
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Company: _____	PO / AFE: _____	<table border="1" style="width:100%; border-collapse: collapse; font-size: 8px;"> <tr> <td>ALK-PCT-VA</td><td>ANIONS-ALL-IC-WR</td><td>CN-CNO-WT</td><td>CN-SCN-VA</td><td>CN-T-CFA-VA</td><td>CN-WAD-CFA-VA</td><td>EC-MAN-WR,PH-MAN-WR</td><td>MET-D-BCMDG-A</td><td>MET-T-BCMDG-VA</td><td>NH3-F-VA</td><td>TDS-VA,TSS-VA</td><td>Rainbow Trout LT50</td><td>Number of Containers</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td>6</td> </tr> <tr> <td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td>6</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6</td> </tr> <tr> <td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td>6</td> </tr> <tr> <td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td>6</td> </tr> <tr> <td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td>6</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6</td> </tr> </table>	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers														X	X	X	X	X	X	X	X	X	X	X		6	X	X	X	X	X	X	X	X	X	X	X		6													6	X	X	X	X	X	X	X	X	X	X	X		6	X	X	X	X	X	X	X	X	X	X	X		6	X	X	X	X	X	X	X	X	X	X	X		6													6													6
ALK-PCT-VA	ANIONS-ALL-IC-WR		CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers																																																																																																																							
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Address: _____	Quote #: Q38399																																																																																																																																			
Phone: _____ Fax: _____	ALS Contact: _____																																																																																																																																			

Lab Work Order # (lab use only)	ALS Contact:	Sampler: JM
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers
	0167-1305 -013			Water													6
	0167-1305 16 -014	16-MAY-13	8:03	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 16 -015	16-MAY-13	9:50	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 -016			Water													6
	0167-1305 -017			Water													6
	0167-1305 16 -018	16-MAY-13	12:19	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 16 -019	16-MAY-13	12:19	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 16 -020	16-MAY-13	12:43	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 16 -021	16-MAY-13	16:28	Water	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 -022			Water													6
	0167-1305 -023			Water													6
	0167-1305 -024			Water													6

Special Instructions: Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details



By L1303548-COFC
 Also provided on an _____
 This form may delay analysis. Please fill in this form LEGIBLY.
 agrees with the Terms and Conditions as provided on a separate Excel tab.
 one numbers and sample container / preservation / holding time table for common analyses.


SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)				
Released by: <u>[Signature]</u>	Date (dd-mmm-yy): _____	Time (hh-mm): _____	Received by: _____	Date: _____	Time: _____	Temperature: _____ °C	Verified by: _____	Date: _____	Time: _____	Observations: Yes / No ? If Yes add SIF

Report To			Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)											
Company: EDI			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT											
Contact: Lindsay Doetzel			Email 1: ldoetzel@edynamics.com															
Address: 3-478 Range Road Y1A #a2			Email 2:															
Phone: 867-393-4882 Fax:			Email 3:				Analysis Request											
Invoice To Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No			Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)											
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No			Job #: Mount Nansen 13-Y-0167															
Company:			PO / AFE:															
Contact:			LSD:															
Address:			Quote #: Q38399															
Phone: Fax:			ALS Contact:															
Lab Work Order # (lab use only)			Sampler:															
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR-PH-MAN-WR	F/P	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA.TSS-VA	Rainbow Trout LT50	Number of Containers
	0167-1305 17 -013	17-MAY-13	8:14	Water	X	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 -014			Water														6
	0167-1305 -015			Water														6
	0167-1305 -016			Water														6
	0167-1305 16 -017	16-MAY-13	15:00	Water	X	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 -018			Water														6
	0167-1305 -019			Water														6
	0167-1305 -020			Water														6
	0167-1305 -021			Water														6
	0167-1305 17 -022	17-MAY-13	10:21	Water	X	X	X	X	X	X	X	X	X	X	X	X		6
	0167-1305 17 -023	17-MAY-13	8:24	Water	X	X	X	X	X	X	X	X	X	X	X	X	X	6
	0167-1305 -024			Water														6
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/Agricultural/Industrial/Residential/Recreational/Hazardous Details)																		
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SHIPMENT RELEASE (client use)						SHIPMENT RECEPTION (lab use only)						SHIPMENT VERIFICATION (lab use only)						
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						°C												



L1303548-COFC



Report To			Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)													
Company: EDI			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT													
Contact: Lindsay Doetzel			Email 1: ldoetzel@edynamics.com																	
Address: 3-478 Range Road Y1A #a2			Email 2:																	
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Lab Work Order # (lab use only)			ALS Contact:		Sampler:															
Sample #	Sample Identification (This description will appear on the report)				Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers
	0167-1305 -025						Water													6
	0167-1305 <u>17</u> -026				<u>17-MAY-13</u>	<u>7:59</u>	Water	X	X	X	X	X	X	X	X	X	X	X		6
							Water													6
							Water													6
							Water													6
							Water													6
							Water													6
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Company: EDI			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT											
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Lab Work Order # (lab use only)			ALS Contact:		Sampler:													
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	CN-CNO-WT	CN-SCN-VA	CN-T-CFA-VA	CN-WAD-CFA-VA	EC-MAN-WR,PH-MAN-WR	MET-D-BCMDG-A	MET-T-BCMDG-VA	NH3-F-VA	TDS-VA,TSS-VA	Rainbow Trout LT50	Number of Containers
	0167-1305	-025			Water													6
	0167-1305	-026			Water													6
	TRIP BLANK				Water	X	X	X	X	X	X	X	X	X	X	X		6
					Water													6
					Water													6
					Water													6
					Water													6
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						°C												

Report To	Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company: EDI	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)
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Invoice To Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No	Client / Project Information	Please indicate below Filtered, Preserved or both (F, P, F/P)
	Job #: Mount Nansen 13-Y-0167	

Company:	PO / AFE:	FULL-TOT-DW-VA
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #: Q38401	

Lab Work Order # _____ (lab_use_only)	ALS Contact:	Sampler:
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type		Number of Containers
	0167-1305 / 7 -030	17-MAY-13	9:03	Water	X	2
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		



Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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SHIPMENT RELEASE (client use)			SHIPMENT, RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
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