ENVIRONMENTAL DYNAMICS INC.

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March 28, 2014

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 March 10-12, 2014 Data Submission

EDI is pleased to submit the lab water quality analysis results for the March 10-12, 2014 sampling event. This represents the last sampling event of the 2013/2014 Water Resource Investigations.

Please find attached a summary table of the water quality results showing *in situ* data as well as lab analysis data for each, with any exceedances of guidelines and/or standards highlighted. The lab Certificate of Analysis is also attached. Electronic copies of the lab data and summary table are also provided by email.

The following data is attached:

- Table 1. Water Quality Results for the March 10-12, 2014 Trip (6 pages)
- ALS Certificate of Analysis (33 pages)

If there are any questions regarding the data, please do not hesitate to contact me at 393-4882 or via email mmarjanovic@edynamics.com.

Sincerely,

EDI Environmental Dynamics Inc.

Submitted via Email

Meghan Marjanovic, R.P.Bio.

Biologist

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-004 WQ-VC-U 11-Mar-14	0167-140310-FIELD FIELD BLANK 10-Mar-14	0167-140311-005 WQ-VC-DBC-r 11-Mar-14	0167-140311-013 WQ-VC-DBC 11-Mar-14	0167-140310-008 WQ-SEEP 10-Mar-14	0167-140310-009 WQ-SEEP-r 10-Mar-14	0167-140310-010 WQ-TP 10-Mar-14
Temperature (in-situ)	°C	-	-	-	0.2	-	-	0.1	0.8	-	0.4
Specific Conductivity (in-situ)	µS/cm	-	-	-	231.8	-	-	238	1818	-	2626
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	6.84	-	-	6.99	6.82	-	7.2
Turbidity (In-situ)	NTU	-	-	-	0.13	-	-	0.28	9.54	-	7.67
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	218	<2.0	231	231	1710	1750	2540
Hardness (as CaCO3)	mg/L	-	-	0.5	121	<0.50	125	125	1050	1050	1700
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.58	***5.93***	7.66	7.64	7.56	7.73	7.82
Total Suspended Solids	mg/L	-	50	3	<3.0	<3.0	<3.0	<3.0	34.7	32	<3.0
Total Dissolved Solids	mg/L	-	-	1	127	<1.0	131	131	1450	1450	2400
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	95.5	<1.0	99.8	99.6	235	235	228
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<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
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	95.5	<1.0	99.8	99.6	235	235	228
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050	***4.4***	***4.41***	***1.11***
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<10
Fluoride (F)	mg/L	0.12	-	0.02	0.045	<0.020	0.047	0.047	***0.38***	***0.36***	***0.73***
Nitrate (as N)	mg/L	13	-	0.005	0.112	<0.0050	0.104	0.103	0.993	0.993	0.16
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.033	0.037	<0.020
Sulfate (SO4)	mg/L	-	-	0.5	23.4	<0.50	23.1	23	854	863	1580
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0112	0.0108	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0488	0.0467	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	0.6	<0.20	0.75
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50	2.8	2.78	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0083	<0.0030	0.0095	0.0097	0.0149	0.0151	0.0087
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.0001	<0.00010	<0.00010	0.0001	0.00072	0.00074	0.0391
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.00027	<0.00010	0.0003	0.00046	***0.0529***	***0.0542***	***0.217***
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0903	<0.000050	0.0935	0.0945	0.0566	0.0601	0.0242
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.0010
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	0.083	0.097	0.174
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	***0.000047***	<0.000010	***0.000054***	***0.000053***	***0.000823***	***0.00088***	***0.00704***
Calcium (Ca)-Total	mg/L	-	-	0.05	32	<0.050	32.2	32.6	309	306	504
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00012	<0.00010	0.00011	0.00012	0.00038	0.00044	0.00064
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.00775	0.00771	0.00131
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.00132	<0.00050	0.0013	0.00132	***0.0052***	***0.00425***	***0.0338***
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.015	<0.010	0.015	0.014	***13.6***	***13.4***	***0.762***
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	0.00011	0.000122	0.00209
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	0.00057	<0.00050	<0.0010	0.00115	0.0142
Magnesium (Mg)-Total	mg/L	-	-	0.1	9.59	<0.10	10.1	10.1	64.7	64.7	103
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.16	<0.000050	0.149	0.145	***6.68***	***6.61***	***4.15***
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000296	<0.000050	0.000331	0.000327	0.00106	0.00108	0.0034
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	0.00075	<0.00050	0.00064	0.00068	0.0029	0.00268	0.0046
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	0.77	<0.10	0.92	0.9	6.87	6.91	29.6
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	0.00024	<0.00020
Silicon (Si)-Total	mg/L	-	-	0.05	6.38	<0.050	6.6	6.66	7.29	7.29	3.87
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	0.000047	0.000041	0.000071
Sodium (Na)-Total	mg/L	-	-	0.05	2.79	<0.050	3.02	2.9	38.9	36.2	37.6
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.295	<0.00020	0.321	0.315	0.816	0.871	1.25
Sulfur (S)-Total	mg/L	-	-	0.5	7.75	<0.50	7.55	7.69	288	282	497
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	0.000484

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-004 WQ-VC-U 11-Mar-14	0167-140310-FIELD FIELD BLANK 10-Mar-14	0167-140311-005 WQ-VC-DBC-r 11-Mar-14	0167-140311-013 WQ-VC-DBC 11-Mar-14	0167-140310-008 WQ-SEEP 10-Mar-14	0167-140310-009 WQ-SEEP-r 10-Mar-14	0167-140310-010 WQ-TP 10-Mar-14
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.020
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000507	<0.000010	0.000623	0.000599	0.00263	0.00261	0.00244
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	0.0017	<0.0020
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.0104	0.0105	***0.612***
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	***0.0063***	<0.0010	***0.0064***	***0.007***	***0.0111***	***0.0128***	<0.0020
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.00068	0.00071	0.0383
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00025	<0.00010	0.00029	0.00028	***0.0396***	***0.0425***	***0.0706***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0916	<0.000050	0.0949	0.0988	0.0563	0.0589	0.0242
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.0010
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	0.083	0.091	0.168
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	***0.000049***	<0.000010	***0.000058***	***0.000058***	***0.000362***	***0.000346***	***0.00674***
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	32.6	<0.050	33.5	33.5	313	311	507
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	0.00035	<0.00020
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.00756	0.00758	0.00124
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00126	<0.00020	0.00123	0.00124	***0.00218***	0.00168	***0.0295***
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.011	<0.010	<0.010	<0.010	***12.6***	***12.6***	0.045
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050	0.00013
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	0.00121	0.0137
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	9.68	<0.10	10.1	10.2	66.2	65.9	106
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.16	<0.000050	0.144	0.144	6.58	6.65	4.07
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.000277	<0.000050	0.000318	0.0003	0.00104	0.00103	0.0032
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	0.00077	<0.00050	0.00063	0.00065	0.0027	0.00266	0.0045
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	0.77	<0.10	0.85	0.88	7.12	7.23	30.7
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.00021	0.00023	<0.00020
Silicon (Si)-Dissolved	mg/L	-	-	0.05	6.53	<0.050	6.76	6.81	7.31	7.23	3.81
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	0.000021	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.91	<0.050	2.91	2.93	38.3	36.7	38.8
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.296	<0.00020	0.301	0.307	0.835	0.87	1.19
Sulfur (S)-Dissolved	mg/L	-	-	0.5	7.68	<0.50	7.5	7.53	276	276	485
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	0.00001	0.000481
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.020
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.0005	<0.000010	0.00057	0.000577	0.00268	0.00249	0.00241
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	0.0013	<0.0020
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	<0.0010	<0.0010	0.0012	0.0013	0.0096	0.0097	0.599

Applied Guidelines: - Federal CCME Canadian Environmental Quality Guidelines (JUL, 2012), CCME: Freshwater Aquatic Life

- Mount Nansen Effluent Quality Standards

Color Key: ***Exceeds CCME Guideline***

Exceeds MN Effluent Quality Standards (EQS)

Exceeds both CCME and EQS

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

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-003 WQ-BC 11-Mar-14	0167-140310-001 WQ-VC-R+150 10-Mar-14	0167-140310-006 WQ-DC-U 10-Mar-14	0167-140311-012 WQ-MS-S-03 11-Mar-14	0167-140311-011 WQ-VC-UMN 11-Mar-14	0167-1403-TRAVEL TRAVEL BLANK 12-Mar-14	0167-140311-014 WQ-PIT-3 11-Mar-14
Temperature (in-situ)	°C	-	-	-	0	0	0	0.5	0.3	-	4.6
Specific Conductivity (in-situ)	µS/cm	-	-	-	251.6	251.1	1678	1200	240.9	-	2695
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.25	7.04	7.08	6.87	7.04	-	6.8
Turbidity (In-situ)	NTU	-	-	-	0.63	0.08	12.1	26.2	0.36	-	1.36
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-	-	-	-	0.43
Colour, True	CU	15	-	5	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	246	249	1590	1160	237	<2.0	2020
Hardness (as CaCO3)	mg/L	-	-	0.5	130	135	985	757	127	<0.50	1380
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.85	7.76	7.76	7.7	7.62	***5.72***	7.93
Total Suspended Solids	mg/L	-	50	3	<3.0	<3.0	14	***70***	<3.0	<3.0	12
Total Dissolved Solids	mg/L	-	-	1	137	144	1330	872	136	<1.0	1800
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	109	99.1	225	259	91.3	<1.0	217
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<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
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	109	99.1	225	259	91.3	<1.0	217
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	<0.0050	***4.24***	0.0491	<0.0050	<0.0050	0.0121
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<5.0
Fluoride (F)	mg/L	0.12	-	0.02	0.056	0.052	***0.44***	***0.39***	0.05	<0.020	***0.38***
Nitrate (as N)	mg/L	13	-	0.005	0.0731	0.186	0.686	<0.050	0.164	<0.0050	0.064
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	0.024	<0.010	<0.0010	<0.0010	<0.010
Sulfate (SO4)	mg/L	-	-	0.5	21.8	32.8	777	441	31.8	<0.50	1160
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	0.0109	<0.0050	<0.0050	<0.0050	-
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	0.0317	<0.0050	<0.0050	<0.0050	-
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	1.89	<0.20	<0.20	<0.20	-
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	1.84	<0.50	<0.50	<0.50	-
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.027	0.0069	0.0582	***0.862***	0.0106	<0.0030	0.0091
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00012	0.00045	0.00053	0.0383	0.00059	<0.00010	0.0036
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0005	0.00106	***0.0524***	***0.366***	0.00057	<0.00010	***0.0109***
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0946	0.0819	0.0632	0.0401	0.0702	<0.000050	0.0134
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	0.067	<0.010	<0.010	<0.010	<0.020
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	***0.000074***	0.000012	***0.000529***	***0.00637***	<0.000010	<0.000010	***0.00433***
Calcium (Ca)-Total	mg/L	-	-	0.05	34.3	33.5	274	190	32.3	<0.050	365
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00071	<0.00010	0.00043	0.00105	0.00011	<0.00010	<0.00020
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00648	0.00161	<0.00010	<0.00010	<0.00020
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.00164	0.00097	***0.00281***	***0.0114***	0.00113	<0.00050	***0.003***
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.114	<0.010	***9.01***	***6.73***	0.01	<0.010	0.046
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	0.000082	<0.000050	0.000117	***0.129***	<0.000050	<0.000050	0.00052
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050	0.00151	<0.00050	0.00883	0.00061	<0.00050	0.0097
Magnesium (Mg)-Total	mg/L	-	-	0.1	11.2	11.8	61.4	61.5	10.3	<0.10	97.2
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0233	0.00364	***5.84***	***1.4***	0.0025	<0.000050	0.149
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000346	0.000377	0.000916	0.000398	0.000259	<0.000050	0.00016
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	0.00056	<0.00050	0.00225	0.00284	<0.00050	<0.00050	<0.0010
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	0.16	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	1.49	1	6.27	3.73	0.9	<0.10	4.15
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	<0.00010	0.00017	<0.00010	<0.00010	<0.00010	<0.00020
Silicon (Si)-Total	mg/L	-	-	0.05	7.9	6.28	6.82	8.14	6.29	<0.050	3.7
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	0.000031	***0.0015***	<0.000010	<0.000010	<0.000020
Sodium (Na)-Total	mg/L	-	-	0.05	3.27	3.5	33	4.57	3.23	<0.050	14.5
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.329	0.284	0.781	0.431	0.278	<0.00020	1.2
Sulfur (S)-Total	mg/L	-	-	0.5	7.4	10.9	254	146	10.5	<0.50	368
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	0.000167	<0.000010	<0.000010	0.000081

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-003 WQ-BC 11-Mar-14	0167-140310-001 WQ-VC-R+150 10-Mar-14	0167-140310-006 WQ-DC-U 10-Mar-14	0167-140311-012 WQ-MS-S-03 11-Mar-14	0167-140311-011 WQ-VC-UMN 11-Mar-14	0167-1403-TRAVEL TRAVEL BLANK 12-Mar-14	0167-140311-014 WQ-PIT-3 11-Mar-14
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00014	0.00014	<0.00010	<0.00010	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	0.047	<0.010	<0.010	<0.020
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000548	0.000566	0.00206	0.00394	0.000364	<0.000010	0.00497
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	0.0015	0.004	<0.0010	<0.0010	<0.0020
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0138	<0.0030	0.0073	***1.18***	<0.0030	<0.0030	***0.618***
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	-	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	***0.0082***	***0.0089***	***0.0072***	0.0021	***0.0057***	-	<0.0020
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00012	0.00045	0.00046	0.0169	0.00061	-	0.00343
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00037	0.00107	***0.0304***	***0.0648***	0.00054	-	***0.00869***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0902	0.0884	0.062	0.0185	0.0713	-	0.013
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.0010
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	0.065	<0.010	<0.010	-	<0.020
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	***0.000067***	0.000012	***0.000201***	***0.000878***	<0.000010	-	***0.00411***
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	34.2	34.4	289	199	34	-	386
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00043	<0.00010	0.00025	<0.00010	<0.00010	-	<0.00020
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00643	0.001	<0.00010	-	<0.00020
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00145	0.00094	0.00113	<0.00020	0.00103	-	***0.00223***
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	<0.010	<0.010	***5.65***	***2.3***	<0.010	-	<0.010
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	<0.000050	<0.000050	<0.000050	0.000568	<0.000050	-	<0.00010
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	0.00158	<0.00050	0.00802	0.00066	-	0.0086
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	10.8	11.8	64.1	63.4	10.3	-	100
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0188	0.00341	5.9	1.36	0.000735	-	0.119
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.000332	0.000362	0.000879	0.000275	0.000254	-	0.00013
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	<0.00050	<0.00050	0.00222	0.00215	<0.00050	-	<0.0010
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	1.32	0.96	6.67	3.51	0.86	-	4.24
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	<0.00010	0.00017	<0.00010	<0.00010	-	<0.00020
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.74	6.36	6.78	6.6	6.47	-	3.85
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000010	<0.000010	0.000012	<0.000010	<0.000010	-	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	0.05	3.31	3.6	34.2	4.65	3.26	-	14.2
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.325	0.284	0.77	0.4	0.274	-	1.18
Sulfur (S)-Dissolved	mg/L	-	-	0.5	7.18	10.8	255	144	10.5	-	366
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	0.000088	<0.000010	-	0.000079
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00020
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.020
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000515	0.000543	0.00204	0.00368	0.000342	-	0.0048
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0020
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0113	<0.0010	0.0058	1.06	<0.0010	-	0.608

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-015 WQ-PIT-2 11-Mar-14	0167-140311-016 WQ-PIT-1 11-Mar-14	0167-140311-017 WQ-PW 11-Mar-14
Temperature (in-situ)	°C	-	-	-	2.2	1	0.5
Specific Conductivity (in-situ)	µS/cm	-	-	-	2072	2092	372
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.24	7.31	7.51
Turbidity (In-situ)	NTU	-	-	-	0.54	0.57	0.12
Dissolved Oxygen (in-situ)	mg/L	-	-	-	5.53	6	-
Colour, True	CU	15	-	5	-	-	<5.0
Conductivity	µS/cm	-	-	2	2010	2010	357
Hardness (as CaCO3)	mg/L	-	-	0.5	1380	1400	199
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.94	7.95	7.76
Total Suspended Solids	mg/L	-	50	3	<3.0	<3.0	-
Total Dissolved Solids	mg/L	-	-	1	1800	1790	211
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	215	216	-
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	-
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	215	216	172
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.0123	0.0117	-
Chloride (Cl)	mg/L	120	-	0.5	<5.0	<5.0	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	***0.49***	***0.37***	0.105
Nitrate (as N)	mg/L	13	-	0.005	0.098	0.062	0.129
Nitrite (as N)	mg/L	0.06	-	0.001	<0.010	<0.010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	1160	1150	34.6
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	-	-	-
Cyanide, Total	mg/L	-	0.3	0.005	-	-	-
Cyanate	mg/L	-	-	0.2	-	-	-
Thiocyanate (SCN)	mg/L	-	-	0.5	-	-	-
Aluminum (Al)-Total	mg/L	0.1	-	0.003	<0.0060	<0.0060	<0.010
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.0036	0.00358	<0.00050
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0107***	***0.0108***	0.00039
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0131	0.0136	0.084
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.0010	<0.0010	-
Boron (B)-Total	mg/L	-	-	0.01	<0.020	<0.020	<0.10
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	***0.00417***	***0.00429***	<0.00020
Calcium (Ca)-Total	mg/L	-	-	0.05	378	386	47.2
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00020	<0.00020	<0.0020
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	***0.0027***	***0.0028***	<0.0010
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.038	0.039	<0.030
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	0.00029	0.00031	0.00065
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0093	0.0093	-
Magnesium (Mg)-Total	mg/L	-	-	0.1	99.5	101	19.6
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.144	0.14	<0.0020
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.00020
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00014	0.00013	-
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	<0.0010	<0.0010	-
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	-
Potassium (K)-Total	mg/L	-	-	0.1	4.32	4.45	0.9
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00020	<0.00020	<0.0010
Silicon (Si)-Total	mg/L	-	-	0.05	3.89	3.97	-
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000020	<0.000020	-
Sodium (Na)-Total	mg/L	-	-	0.05	14.6	14.5	5.2
Strontium (Sr)-Total	mg/L	-	-	0.0002	1.23	1.22	-
Sulfur (S)-Total	mg/L	-	-	0.5	376	379	-
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000081	0.00008	-

Table 1. Water Quality Results for the March 10-12, 2014 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	0167-140311-015 WQ-PIT-2 11-Mar-14	0167-140311-016 WQ-PIT-1 11-Mar-14	0167-140311-017 WQ-PW 11-Mar-14
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.020	<0.020	-
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00507	0.00507	0.00197
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0020	<0.0020	-
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.618***	***0.625***	<0.050
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	-
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	<0.0020	<0.0020	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.0036	0.00344	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	***0.00864***	***0.00862***	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0131	0.0133	-
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	-
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.020	<0.020	-
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	***0.00422***	***0.00409***	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	386	392	-
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00020	<0.00020	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	***0.00226***	***0.00219***	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	<0.010	<0.010	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	<0.00010	<0.00010	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0098	0.0088	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	101	103	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.113	0.109	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.00013	0.00013	-
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	<0.0010	<0.0010	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	4.19	4.27	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00020	<0.00020	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	3.85	3.89	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000020	<0.000020	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	14.1	14.4	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	1.21	1.18	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	365	368	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	0.000078	0.000077	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.020	<0.020	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.00482	0.00491	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0020	<0.0020	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.614	0.61	-

ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195 - 2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 12-MAR-14
Report Date: 26-MAR-14 10:12 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1431475

Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167/14-Y-0233
C of C Numbers: 1, 2
Legal Site Desc:

Comments:

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-1	L1431475-2	L1431475-3	L1431475-4	L1431475-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	11-MAR-14	10-MAR-14	11-MAR-14	11-MAR-14	10-MAR-14
	Sampled Time	13:42	19:44	12:40	12:50	18:00
	Client ID	0167-140311-004	0167-140310-FIELD BLANK	0167-140311-005	0167-140311-013	0167-140310-008
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	218	<2.0	231	231	1710
	Hardness (as CaCO3) (mg/L)	121	<0.50	125	125	1050
	pH (pH)	7.58	5.93	7.66	7.64	7.56
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	34.7
	Total Dissolved Solids (mg/L)	127	<1.0	131	131	1450
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	95.5	<1.0	99.8	99.6	235
	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)	95.5	<1.0	99.8	99.6	235
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	4.40
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<5.0 DLA
	Fluoride (F) (mg/L)	0.045	<0.020	0.047	0.047	0.38
	Nitrate (as N) (mg/L)	0.112	<0.0050	0.104	0.103	0.993
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.033
	Sulfate (SO4) (mg/L)	23.4	<0.50	23.1	23.0	854
	Anion Sum (meq/L)	2.41	<0.10	2.49	2.48	22.6
	Cation Sum (meq/L)	2.57	<0.10	2.66	2.66	24.1
	Cation - Anion Balance (%)	3.3	0.0	3.3	3.6	3.4
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0112
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0488
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	0.60
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	2.80
Total Metals	Aluminum (Al)-Total (mg/L)	0.0083	<0.0030	0.0095	0.0097	0.0149
	Antimony (Sb)-Total (mg/L)	0.00010	<0.00010	<0.00010	0.00010	0.00072
	Arsenic (As)-Total (mg/L)	0.00027	<0.00010	0.00030	0.00046	0.0529
	Barium (Ba)-Total (mg/L)	0.0903	<0.000050	0.0935	0.0945	0.0566
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010 DLA
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.083
	Cadmium (Cd)-Total (mg/L)	0.000047	<0.000010	0.000054	0.000053	0.000823
	Calcium (Ca)-Total (mg/L)	32.0	<0.050	32.2	32.6	309
	Chromium (Cr)-Total (mg/L)	0.00012	<0.00010	0.00011	0.00012	0.00038
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00775
	Copper (Cu)-Total (mg/L)	0.00132	<0.00050	0.00130	0.00132	0.0052
	Iron (Fe)-Total (mg/L)	0.015	<0.010	0.015	0.014	13.6
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.00011
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	0.00057	<0.00050	<0.0010 DLA

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-6	L1431475-7	L1431475-8	L1431475-9	L1431475-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	10-MAR-14	10-MAR-14	11-MAR-14	10-MAR-14	10-MAR-14
	Sampled Time	18:00	18:55	15:35	13:56	16:50
	Client ID	0167-140310-009	0167-140310-010	0167-140311-003	0167-140310-001	0167-140310-006
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1750	2540	246	249	1590
	Hardness (as CaCO3) (mg/L)	1050	1700	130	135	985
	pH (pH)	7.73	7.82	7.85	7.76	7.76
	Total Suspended Solids (mg/L)	32.0	<3.0	<3.0	<3.0	14.0
	Total Dissolved Solids (mg/L)	1450	2400	137	144	1330
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	235	228	109	99.1	225
	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)	235	228	109	99.1	225
	Ammonia, Total (as N) (mg/L)	4.41	1.11	<0.0050	<0.0050	4.24
	Chloride (Cl) (mg/L)	<5.0 DLA	<10 DLA	<0.50	<0.50	<5.0 DLA
	Fluoride (F) (mg/L)	0.36	0.73	0.056	0.052	0.44
	Nitrate (as N) (mg/L)	0.993	0.16	0.0731	0.186	0.686
	Nitrite (as N) (mg/L)	0.037	<0.020 DLA	<0.0010	<0.0010	0.024
	Sulfate (SO4) (mg/L)	863	1580	21.8	32.8	777
	Anion Sum (meq/L)	22.8	37.4	2.63	2.68	20.7
	Cation Sum (meq/L)	24.0	36.7	2.78	2.87	22.2
	Cation - Anion Balance (%)	2.6	-1.0	2.7	3.5	3.3
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0108	<0.0050	<0.0050	<0.0050	0.0109
	Cyanide, Total (mg/L)	0.0467	<0.0050	<0.0050	<0.0050	0.0317
	Cyanate (mg/L)	<0.20	0.75	<0.20	<0.20	1.89
	Thiocyanate (SCN) (mg/L)	2.78	<0.50	<0.50	<0.50	1.84
Total Metals	Aluminum (Al)-Total (mg/L)	0.0151	0.0087	0.0270	0.0069	0.0582
	Antimony (Sb)-Total (mg/L)	0.00074	0.0391	0.00012	0.00045	0.00053
	Arsenic (As)-Total (mg/L)	0.0542	0.217	0.00050	0.00106	0.0524
	Barium (Ba)-Total (mg/L)	0.0601	0.0242	0.0946	0.0819	0.0632
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00020 DLA	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.0010 DLA	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.097	0.174	<0.010	<0.010	0.067
	Cadmium (Cd)-Total (mg/L)	0.000880	0.00704	0.000074	0.000012	0.000529
	Calcium (Ca)-Total (mg/L)	306	504	34.3	33.5	274
	Chromium (Cr)-Total (mg/L)	0.00044	0.00064	0.00071	<0.00010	0.00043
	Cobalt (Co)-Total (mg/L)	0.00771	0.00131	<0.00010	<0.00010	0.00648
	Copper (Cu)-Total (mg/L)	0.00425	0.0338	0.00164	0.00097	0.00281
	Iron (Fe)-Total (mg/L)	13.4	0.762	0.114	<0.010	9.01
	Lead (Pb)-Total (mg/L)	0.000122	0.00209	0.000082	<0.000050	0.000117
	Lithium (Li)-Total (mg/L)	0.00115	0.0142	<0.00050	0.00151	<0.00050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-11	L1431475-12	L1431475-13		
	Description	Water	Water	Water		
	Sampled Date	11-MAR-14	11-MAR-14	12-MAR-14		
	Sampled Time	08:50	09:42	12:20		
	Client ID	0167-140311-012	0167-140311-011	0167-1403-TRAVEL BLANK		
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1160	237	<2.0		
	Hardness (as CaCO3) (mg/L)	757	127	<0.50		
	pH (pH)	7.70	7.62	5.72		
	Total Suspended Solids (mg/L)	70.0	<3.0	<3.0		
	Total Dissolved Solids (mg/L)	872	136	<1.0		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	259	91.3	<1.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)	259	91.3	<1.0		
	Ammonia, Total (as N) (mg/L)	0.0491	<0.0050	<0.0050		
	Chloride (Cl) (mg/L)	<5.0 DLA	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.39	0.050	<0.020		
	Nitrate (as N) (mg/L)	<0.050 DLA	0.164	<0.0050		
	Nitrite (as N) (mg/L)	<0.010 DLA	<0.0010	<0.0010		
	Sulfate (SO4) (mg/L)	441	31.8	<0.50		
	Anion Sum (meq/L)	14.4	2.50	<0.10		
	Cation Sum (meq/L)	15.6	2.71	<0.10		
	Cation - Anion Balance (%)	4.1	4.0	0.0		
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050		
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Cyanate (mg/L)	<0.20	<0.20	<0.20		
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	0.862	0.0106	<0.0030		
	Antimony (Sb)-Total (mg/L)	0.0383	0.00059	<0.00010		
	Arsenic (As)-Total (mg/L)	0.366	0.00057	<0.00010		
	Barium (Ba)-Total (mg/L)	0.0401	0.0702	<0.000050		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010		
	Cadmium (Cd)-Total (mg/L)	0.00637	<0.000010	<0.000010		
	Calcium (Ca)-Total (mg/L)	190	32.3	<0.050		
	Chromium (Cr)-Total (mg/L)	0.00105	0.00011	<0.00010		
	Cobalt (Co)-Total (mg/L)	0.00161	<0.00010	<0.00010		
	Copper (Cu)-Total (mg/L)	0.0114	0.00113	<0.00050		
	Iron (Fe)-Total (mg/L)	6.73	0.010	<0.010		
	Lead (Pb)-Total (mg/L)	0.129	<0.000050	<0.000050		
	Lithium (Li)-Total (mg/L)	0.00883	0.00061	<0.00050		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-1	L1431475-2	L1431475-3	L1431475-4	L1431475-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	11-MAR-14	10-MAR-14	11-MAR-14	11-MAR-14	10-MAR-14
	Sampled Time	13:42	19:44	12:40	12:50	18:00
	Client ID	0167-140311-004	0167-140310-FIELD BLANK	0167-140311-005	0167-140311-013	0167-140310-008
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	9.59	<0.10	10.1	10.1	64.7
	Manganese (Mn)-Total (mg/L)	0.160	<0.000050	0.149	0.145	6.68
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000296	<0.000050	0.000331	0.000327	0.00106
	Nickel (Ni)-Total (mg/L)	0.00075	<0.00050	0.00064	0.00068	0.0029
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.77	<0.10	0.92	0.90	6.87
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Silicon (Si)-Total (mg/L)	6.38	<0.050	6.60	6.66	7.29
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000047
	Sodium (Na)-Total (mg/L)	2.79	<0.050	3.02	2.90	38.9
	Strontium (Sr)-Total (mg/L)	0.295	<0.00020	0.321	0.315	0.816
	Sulfur (S)-Total (mg/L)	7.75	<0.50	7.55	7.69	288
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020 DLA
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.020 DLA
	Uranium (U)-Total (mg/L)	0.000507	<0.000010	0.000623	0.000599	0.00263
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020 DLA
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	0.0104
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0063	<0.0010	0.0064	0.0070	0.0111
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00068
	Arsenic (As)-Dissolved (mg/L)	0.00025	<0.00010	0.00029	0.00028	0.0396
	Barium (Ba)-Dissolved (mg/L)	0.0916	<0.000050	0.0949	0.0988	0.0563
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010 DLA
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	0.083
	Cadmium (Cd)-Dissolved (mg/L)	0.000049	<0.000010	0.000058	0.000058	0.000362
	Calcium (Ca)-Dissolved (mg/L)	32.6	<0.050	33.5	33.5	313
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00756
	Copper (Cu)-Dissolved (mg/L)	0.00126	<0.00020	0.00123	0.00124	0.00218
	Iron (Fe)-Dissolved (mg/L)	0.011	<0.010	<0.010	<0.010	12.6
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010 DLA
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010 DLA
	Magnesium (Mg)-Dissolved (mg/L)	9.68	<0.10	10.1	10.2	66.2

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-6	L1431475-7	L1431475-8	L1431475-9	L1431475-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	10-MAR-14	10-MAR-14	11-MAR-14	10-MAR-14	10-MAR-14
	Sampled Time	18:00	18:55	15:35	13:56	16:50
	Client ID	0167-140310-009	0167-140310-010	0167-140311-003	0167-140310-001	0167-140310-006
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	64.7	103	11.2	11.8	61.4
	Manganese (Mn)-Total (mg/L)	6.61	4.15	0.0233	0.00364	5.84
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00108	0.00340	0.000346	0.000377	0.000916
	Nickel (Ni)-Total (mg/L)	0.00268	0.0046	0.00056	<0.00050	0.00225
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	6.91	29.6	1.49	1.00	6.27
	Selenium (Se)-Total (mg/L)	0.00024	<0.00020 DLA	<0.00010	<0.00010	0.00017
	Silicon (Si)-Total (mg/L)	7.29	3.87	7.90	6.28	6.82
	Silver (Ag)-Total (mg/L)	0.000041	0.000071	<0.000010	<0.000010	0.000031
	Sodium (Na)-Total (mg/L)	36.2	37.6	3.27	3.50	33.0
	Strontium (Sr)-Total (mg/L)	0.871	1.25	0.329	0.284	0.781
	Sulfur (S)-Total (mg/L)	282	497	7.40	10.9	254
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000484	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00020 DLA	<0.00010	<0.00010	0.00014
	Titanium (Ti)-Total (mg/L)	<0.010	<0.020 DLA	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00261	0.00244	0.000548	0.000566	0.00206
	Vanadium (V)-Total (mg/L)	0.0017	<0.0020 DLA	<0.0010	<0.0010	0.0015
	Zinc (Zn)-Total (mg/L)	0.0105	0.612	0.0138	<0.0030	0.0073
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0128	<0.0020 DLA	0.0082	0.0089	0.0072
	Antimony (Sb)-Dissolved (mg/L)	0.00071	0.0383	0.00012	0.00045	0.00046
	Arsenic (As)-Dissolved (mg/L)	0.0425	0.0706	0.00037	0.00107	0.0304
	Barium (Ba)-Dissolved (mg/L)	0.0589	0.0242	0.0902	0.0884	0.0620
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00020 DLA	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.0010 DLA	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.091	0.168	<0.010	<0.010	0.065
	Cadmium (Cd)-Dissolved (mg/L)	0.000346	0.00674	0.000067	0.000012	0.000201
	Calcium (Ca)-Dissolved (mg/L)	311	507	34.2	34.4	289
	Chromium (Cr)-Dissolved (mg/L)	0.00035	<0.00020 DLA	0.00043	<0.00010	0.00025
	Cobalt (Co)-Dissolved (mg/L)	0.00758	0.00124	<0.00010	<0.00010	0.00643
	Copper (Cu)-Dissolved (mg/L)	0.00168	0.0295	0.00145	0.00094	0.00113
	Iron (Fe)-Dissolved (mg/L)	12.6	0.045	<0.010	<0.010	5.65
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.00013	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00121	0.0137	<0.00050	0.00158	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)	65.9	106	10.8	11.8	64.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-11	L1431475-12	L1431475-13		
	Description	Water	Water	Water		
	Sampled Date	11-MAR-14	11-MAR-14	12-MAR-14		
	Sampled Time	08:50	09:42	12:20		
	Client ID	0167-140311-012	0167-140311-011	0167-1403-TRAVEL BLANK		
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	61.5	10.3	<0.10		
	Manganese (Mn)-Total (mg/L)	1.40	0.00250	<0.000050		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	0.000398	0.000259	<0.000050		
	Nickel (Ni)-Total (mg/L)	0.00284	<0.00050	<0.00050		
	Phosphorus (P)-Total (mg/L)	0.160	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	3.73	0.90	<0.10		
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Total (mg/L)	8.14	6.29	<0.050		
	Silver (Ag)-Total (mg/L)	0.00150	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	4.57	3.23	<0.050		
	Strontium (Sr)-Total (mg/L)	0.431	0.278	<0.00020		
	Sulfur (S)-Total (mg/L)	146	10.5	<0.50		
	Thallium (Tl)-Total (mg/L)	0.000167	<0.000010	<0.000010		
	Tin (Sn)-Total (mg/L)	0.00014	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	0.047	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.00394	0.000364	<0.000010		
	Vanadium (V)-Total (mg/L)	0.0040	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	1.18	<0.0030	<0.0030		
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0021	0.0057			
	Antimony (Sb)-Dissolved (mg/L)	0.0169	0.00061			
	Arsenic (As)-Dissolved (mg/L)	0.0648	0.00054			
	Barium (Ba)-Dissolved (mg/L)	0.0185	0.0713			
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010			
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050			
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010			
	Cadmium (Cd)-Dissolved (mg/L)	0.000878	<0.000010			
	Calcium (Ca)-Dissolved (mg/L)	199	34.0			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	0.00100	<0.00010			
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00103			
	Iron (Fe)-Dissolved (mg/L)	2.30	<0.010			
	Lead (Pb)-Dissolved (mg/L)	0.000568	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	0.00802	0.00066			
	Magnesium (Mg)-Dissolved (mg/L)	63.4	10.3			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-1	L1431475-2	L1431475-3	L1431475-4	L1431475-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	11-MAR-14	10-MAR-14	11-MAR-14	11-MAR-14	10-MAR-14
	Sampled Time	13:42	19:44	12:40	12:50	18:00
	Client ID	0167-140311-004	0167-140310-FIELD BLANK	0167-140311-005	0167-140311-013	0167-140310-008
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.160	<0.000050	0.144	0.144	6.58
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000277	<0.000050	0.000318	0.000300	0.00104
	Nickel (Ni)-Dissolved (mg/L)	0.00077	<0.00050	0.00063	0.00065	0.0027
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.77	<0.10	0.85	0.88	7.12
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00021
	Silicon (Si)-Dissolved (mg/L)	6.53	<0.050	6.76	6.81	7.31
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020 DLA
	Sodium (Na)-Dissolved (mg/L)	2.91	<0.050	2.91	2.93	38.3
	Strontium (Sr)-Dissolved (mg/L)	0.296	<0.00020	0.301	0.307	0.835
	Sulfur (S)-Dissolved (mg/L)	7.68	<0.50	7.50	7.53	276
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020 DLA
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.020 DLA
	Uranium (U)-Dissolved (mg/L)	0.000500	<0.000010	0.000570	0.000577	0.00268
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020 DLA
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.0012	0.0013	0.0096

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-6	L1431475-7	L1431475-8	L1431475-9	L1431475-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	10-MAR-14	10-MAR-14	11-MAR-14	10-MAR-14	10-MAR-14
	Sampled Time	18:00	18:55	15:35	13:56	16:50
	Client ID	0167-140310-009	0167-140310-010	0167-140311-003	0167-140310-001	0167-140310-006
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	6.65	4.07	0.0188	0.00341	5.90
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00103	0.00320	0.000332	0.000362	0.000879
	Nickel (Ni)-Dissolved (mg/L)	0.00266	0.0045	<0.00050	<0.00050	0.00222
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	7.23	30.7	1.32	0.96	6.67
	Selenium (Se)-Dissolved (mg/L)	0.00023	<0.00020 DLA	<0.00010	<0.00010	0.00017
	Silicon (Si)-Dissolved (mg/L)	7.23	3.81	7.74	6.36	6.78
	Silver (Ag)-Dissolved (mg/L)	0.000021	<0.000020 DLA	<0.000010	<0.000010	0.000012
	Sodium (Na)-Dissolved (mg/L)	36.7	38.8	3.31	3.60	34.2
	Strontium (Sr)-Dissolved (mg/L)	0.870	1.19	0.325	0.284	0.770
	Sulfur (S)-Dissolved (mg/L)	276	485	7.18	10.8	255
	Thallium (Tl)-Dissolved (mg/L)	0.000010	0.000481	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00020 DLA	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.020 DLA	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00249	0.00241	0.000515	0.000543	0.00204
	Vanadium (V)-Dissolved (mg/L)	0.0013	<0.0020 DLA	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0097	0.599	0.0113	<0.0010	0.0058

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431475-11	L1431475-12	L1431475-13		
	Description	Water	Water	Water		
	Sampled Date	11-MAR-14	11-MAR-14	12-MAR-14		
	Sampled Time	08:50	09:42	12:20		
	Client ID	0167-140311-012	0167-140311-011	0167-1403-TRAVEL BLANK		
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	1.36	0.000735			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Dissolved (mg/L)	0.000275	0.000254			
	Nickel (Ni)-Dissolved (mg/L)	0.00215	<0.00050			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	3.51	0.86			
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Dissolved (mg/L)	6.60	6.47			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Dissolved (mg/L)	4.65	3.26			
	Strontium (Sr)-Dissolved (mg/L)	0.400	0.274			
	Sulfur (S)-Dissolved (mg/L)	144	10.5			
	Thallium (Tl)-Dissolved (mg/L)	0.000088	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	0.00368	0.000342			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	1.06	<0.0010			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431475-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Boron (B)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Copper (Cu)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Total	MS-B	L1431475-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Total	MS-B	L1431475-1, -10, -11, -12, -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-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-CL-IC-WR	Water	Chloride by Ion Chromatography	EPA 300.1

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

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

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

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

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

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

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

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

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

CN-CNO-WT	Water	Cyanate	APHA 4500-CN-L

This analysis is carried out using procedures adapted from APHA method 4500-CN "Cyanide". Cyanate is determined by the Cyanate hydrolysis method using an ammonia selective electrode

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.

Reference Information

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.

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

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

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

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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

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

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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

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

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

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

Reference Information

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-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

TSS-MAN-WR Water Total Suspended Solids by Gravimetric APHA 2540 D

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

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

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

Laboratory Definition Code	Laboratory Location
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

Reference Information

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431475-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / Distribution		Turnaround Time (TAT) (Rush TAT is not available for all tests)
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)		R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Meghan Marjanovic	Quality Control (QC) Report with Report ☐ Yes ☐ No		P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax mmarjanovic@edynamics.com		Specify Date Required for E2,E or P:
		Email 2		

Invoice To		Invoice Distribution	
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax sjenner@edynamics.com	
Company:	EDI	Email 2	
Contact:	S Jenner		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38399	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 13-Y-0167/14-Y-0233	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): ALS Contact: Sean Sluggett Sampler: JM & DH

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
	0167-1403 11 - 004	11 - Mar - 14	13:42	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 10 - Field Blank	10 - Mar - 14	19:44	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 11 - 005	11 - Mar - 14	12:40	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 11 - 013	11 - Mar - 14	12:50	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 10 - 008	10 - Mar - 14	18:00	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 10 - 009	10 - Mar - 14	18:00	Water	R	R	R	R	R	R	R	R	R					9
	0167-1403 10 - 010	10 - Mar - 14	18:55	Water	R	R	R	R	R	R	R	R	R					9

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐	SIF Observations	Yes ☐	No ☐
Ice Packs ☐ Yes ☐ No	Custody seal intact	Yes ☐	No ☐
Cooling Initiated ☐			
INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
20.1 14.1 20.8			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	11 March 14	18:35		12-Mar-14	12:25			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326e v09 Front/04 January 2014

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431475-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Meghan Marjanovic	Quality Control (QC) Report with Report ☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax mmarjanovic@edynamics.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To		Invoice Distribution
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax sjenner@edynamics.com
Company:	EDI	Email 2
Contact:	S Jenner	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38399	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 13-Y-0167/14-Y-0233	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Sean Sluggett Sampler: JM & DH

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA	Number of Containers
							P	P	P	P	P	F/P		
	0167-1403 11 - 003	11 - Mar - 14	15:35	Water	R	R	R	R	R	R	R	R	R	9
	0167-1403 10 - 001	10 - Mar - 14	13:56	Water	R	R	R	R	R	R	R	R	R	9
	0167-1403 10 - 006	10 - Mar - 14	16:50	Water	R	R	R	R	R	R	R	R	R	9
	0167-1403 11 - 012	11 - Mar - 14	08:50	Water	R	R	R	R	R	R	R	R	R	9
	0167-1403 11 - 011	11 - Mar - 14	09:42	Water	R	R	R	R	R	R	R	R	R	9
	0167-1403 - Travel Blank	- Mar - 14		Water	R	R	R	R	R	R	R	R	R	9
	~~0167-1403 -~~	~~- Mar - 14~~		~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~9~~

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Dany Thériault	11 March 14	18:40						

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326e v09 Front/04 January 2014

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

ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195 - 2nd Ave
Whitehorse YT Y1A 3A2

Date Received: 12-MAR-14
Report Date: 25-MAR-14 10:18 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1431492

Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167/14-Y-0233
C of C Numbers: 1
Legal Site Desc:

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431492-1	L1431492-2	L1431492-3	L1431492-4	
	Description	Water	Water	Water	Water	
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	
	Sampled Time	16:35	16:40	16:45	15:15	
	Client ID	0167-140311-014	0167-140311-015	0167-140311-016	0167-140311-017	
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)				<5.0	
	Conductivity (uS/cm)	2020	2010	2010	357	
	Hardness (as CaCO3) (mg/L)	1380	1380	1400	199	
	pH (pH)	7.93	7.94	7.95	7.76	
	Total Suspended Solids (mg/L)	12.0	<3.0	<3.0		
	Total Dissolved Solids (mg/L)	1800	1800	1790	211	
	Turbidity (NTU)				<0.10	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	217	215	216		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)	217	215	216	172	
	Ammonia, Total (as N) (mg/L)	0.0121	0.0123	0.0117		
	Chloride (Cl) (mg/L)	<5.0 DLA	<5.0 DLA	<5.0 DLA	<0.50	
	Fluoride (F) (mg/L)	0.38	0.49	0.37	0.105	
	Nitrate (as N) (mg/L)	0.064	0.098	0.062	0.129	
	Nitrite (as N) (mg/L)	<0.010 DLA	<0.010 DLA	<0.010 DLA	<0.0010	
	Sulfate (SO4) (mg/L)	1160	1160	1150	34.6	
	Anion Sum (meq/L)	28.5	28.6	28.2	4.17	
	Cation Sum (meq/L)	28.3	28.4	28.8	4.22	
	Cation - Anion Balance (%)	-0.5	-0.3	1.0	0.6	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0091	<0.0060 DLA	<0.0060 DLA	<0.010	
	Antimony (Sb)-Total (mg/L)	0.00360	0.00360	0.00358	<0.00050	
	Arsenic (As)-Total (mg/L)	0.0109	0.0107	0.0108	0.00039	
	Barium (Ba)-Total (mg/L)	0.0134	0.0131	0.0136	0.084	
	Beryllium (Be)-Total (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA		
	Bismuth (Bi)-Total (mg/L)	<0.0010 DLA	<0.0010 DLA	<0.0010 DLA		
	Boron (B)-Total (mg/L)	<0.020 DLA	<0.020 DLA	<0.020 DLA	<0.10	
	Cadmium (Cd)-Total (mg/L)	0.00433	0.00417	0.00429	<0.00020	
	Calcium (Ca)-Total (mg/L)	365	378	386	47.2	
	Chromium (Cr)-Total (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA	<0.0020	
	Cobalt (Co)-Total (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA		
	Copper (Cu)-Total (mg/L)	0.0030	0.0027	0.0028	<0.0010	
	Iron (Fe)-Total (mg/L)	0.046	0.038	0.039	<0.030	
	Lead (Pb)-Total (mg/L)	0.00052	0.00029	0.00031	0.00065	
	Lithium (Li)-Total (mg/L)	0.0097	0.0093	0.0093		
	Magnesium (Mg)-Total (mg/L)	97.2	99.5	101	19.6	
	Manganese (Mn)-Total (mg/L)	0.149	0.144	0.140	<0.0020	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431492-1	L1431492-2	L1431492-3	L1431492-4	
	Description	Water	Water	Water	Water	
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	
	Sampled Time	16:35	16:40	16:45	15:15	
	Client ID	0167-140311-014	0167-140311-015	0167-140311-016	0167-140311-017	
Grouping	**Analyte**					
WATER						
Total Metals	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.00020	
	Molybdenum (Mo)-Total (mg/L)	0.00016	0.00014	0.00013		
	Nickel (Ni)-Total (mg/L)	DLA <0.0010	DLA <0.0010	DLA <0.0010		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	4.15	4.32	4.45	0.90	
	Selenium (Se)-Total (mg/L)	DLA <0.00020	DLA <0.00020	DLA <0.00020	<0.0010	
	Silicon (Si)-Total (mg/L)	3.70	3.89	3.97		
	Silver (Ag)-Total (mg/L)	DLA <0.000020	DLA <0.000020	DLA <0.000020		
	Sodium (Na)-Total (mg/L)	14.5	14.6	14.5	5.2	
	Strontium (Sr)-Total (mg/L)	1.20	1.23	1.22		
	Sulfur (S)-Total (mg/L)	368	376	379		
	Thallium (Tl)-Total (mg/L)	0.000081	0.000081	0.000080		
	Tin (Sn)-Total (mg/L)	DLA <0.00020	DLA <0.00020	DLA <0.00020		
	Titanium (Ti)-Total (mg/L)	DLA <0.020	DLA <0.020	DLA <0.020		
	Uranium (U)-Total (mg/L)	0.00497	0.00507	0.00507	0.00197	
	Vanadium (V)-Total (mg/L)	DLA <0.0020	DLA <0.0020	DLA <0.0020		
	Zinc (Zn)-Total (mg/L)	0.618	0.618	0.625	<0.050	
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD		
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	DLA <0.0020	DLA <0.0020	DLA <0.0020		
	Antimony (Sb)-Dissolved (mg/L)	0.00343	0.00360	0.00344		
	Arsenic (As)-Dissolved (mg/L)	0.00869	0.00864	0.00862		
	Barium (Ba)-Dissolved (mg/L)	0.0130	0.0131	0.0133		
	Beryllium (Be)-Dissolved (mg/L)	DLA <0.00020	DLA <0.00020	DLA <0.00020		
	Bismuth (Bi)-Dissolved (mg/L)	DLA <0.0010	DLA <0.0010	DLA <0.0010		
	Boron (B)-Dissolved (mg/L)	DLA <0.020	DLA <0.020	DLA <0.020		
	Cadmium (Cd)-Dissolved (mg/L)	0.00411	0.00422	0.00409		
	Calcium (Ca)-Dissolved (mg/L)	386	386	392		
	Chromium (Cr)-Dissolved (mg/L)	DLA <0.00020	DLA <0.00020	DLA <0.00020		
	Cobalt (Co)-Dissolved (mg/L)	DLA <0.00020	DLA <0.00020	DLA <0.00020		
	Copper (Cu)-Dissolved (mg/L)	0.00223	0.00226	0.00219		
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Lead (Pb)-Dissolved (mg/L)	DLA <0.00010	DLA <0.00010	DLA <0.00010		
	Lithium (Li)-Dissolved (mg/L)	0.0086	0.0098	0.0088		
	Magnesium (Mg)-Dissolved (mg/L)	100	101	103		
	Manganese (Mn)-Dissolved (mg/L)	0.119	0.113	0.109		
	Mercury (Hg)-Dissolved (mg/L)	<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	L1431492-1	L1431492-2	L1431492-3	L1431492-4	
	Description	Water	Water	Water	Water	
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	
	Sampled Time	16:35	16:40	16:45	15:15	
	Client ID	0167-140311-014	0167-140311-015	0167-140311-016	0167-140311-017	
Grouping	**Analyte**					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.00013	0.00013	0.00013		
	Nickel (Ni)-Dissolved (mg/L)	<0.0010 DLA	<0.0010 DLA	<0.0010 DLA		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	4.24	4.19	4.27		
	Selenium (Se)-Dissolved (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA		
	Silicon (Si)-Dissolved (mg/L)	3.85	3.85	3.89		
	Silver (Ag)-Dissolved (mg/L)	<0.000020 DLA	<0.000020 DLA	<0.000020 DLA		
	Sodium (Na)-Dissolved (mg/L)	14.2	14.1	14.4		
	Strontium (Sr)-Dissolved (mg/L)	1.18	1.21	1.18		
	Sulfur (S)-Dissolved (mg/L)	366	365	368		
	Thallium (Tl)-Dissolved (mg/L)	0.000079	0.000078	0.000077		
	Tin (Sn)-Dissolved (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA		
	Titanium (Ti)-Dissolved (mg/L)	<0.020 DLA	<0.020 DLA	<0.020 DLA		
	Uranium (U)-Dissolved (mg/L)	0.00480	0.00482	0.00491		
	Vanadium (V)-Dissolved (mg/L)	<0.0020 DLA	<0.0020 DLA	<0.0020 DLA		
	Zinc (Zn)-Dissolved (mg/L)	0.608	0.614	0.610		

* 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)
Method Blank	Barium (Ba)-Total	MB-LOR	L1431492-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431492-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L1431492-4

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

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 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.

COLOUR-TRUE-WR	Water	Colour (True) by Spectrometer	APHA 2120

"This analysis is carried out using procedures adapted from APHA Method 2120 ""Color"". 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. Aparent 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-MAN-WR	Water	Conductivity by Meter	APHA 2510 (B)

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

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

Reference Information

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

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

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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

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

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-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

Reference Information

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. Waston et al.

PH-MAN-WR	Water	pH by Meter	APHA 4500-H (B)

"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."

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-CALC-VA	Water	TDS (Calculated)	APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

TSS-MAN-WR	Water	Total Suspended Solids by Gravimetric	APHA 2540 D

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

TURBIDITY-WR	Water	Turbidity by Nephelometer	APHA 2130

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

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

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

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

Chain of Custody Numbers:

1

Reference Information

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431492-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / Distribution		Turnaround Time (TAT) (Rush TAT is not available for all tests)
Company:	EDI	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Meghan Marjanovic	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax	mmarjanovic@edynamics.com	Specify Date Required for E2,E or P:
		Email 2		

Invoice To		Invoice Distribution		Analysis Request
	Same as Report To ☐ Yes ☑ No			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	
Company:	EDI	Email 1 or Fax	sjenner@edynamics.com	
Contact:	S Jenner	Email 2		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38400	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 13-Y-0167 / 14-Y-0233	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)

ALS Contact: Sean Sluggett **Sampler:** JM & DH

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,PH-PCT-VA,EC-PCT-VA	ANIONS-ALL-IC-WR, TSS-MAN-WR	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	TDS-CALC-VA,IONBLANCE-VA		FULL-TOT-DW-WR						Number of Containers
							P	P	F/P									
1	0167-1403 11 -014	11 - Mar - 14	16:35	Water	R	R	R	R	R	R								6
2	0167-1403 11 -015	11 - Mar - 14	16:40	Water	R	R	R	R	R	R								6
3	0167-1403 11 -016	11 - Mar - 14	16:45	Water	R	R	R	R	R	R								6
4	0167-1403 11 -017	11 - Mar - 14	15:15	Water								R						3

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
0.4	1.2	0.8			4.5 °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	11 March 14	18:30		12-Mar-13	12:20		Mar 13/14	1:35

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0226e-COC-FrontAll-January 2014

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

ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195 - 2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 12-MAR-14
Report Date: 27-MAR-14 15:44 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1431509

Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167/14-Y-0223
C of C Numbers: 1
Legal Site Desc:

Comments: Please note ALS identied sample L1431509-1 was sublet to Nautilus Environmental for LT50 Rainbow Trout analysis.

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID					
Grouping **Analyte**					

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

** 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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg 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

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

Report Date: March 27, 2014
Work Order: 14107

Data Report

Species: **Rainbow trout (*Oncorhynchus mykiss*)**
Protocol: **EPS 1/RM/13 (Second Ed. with 2007 amendments)**

Table 1. Results for the 96-h rainbow trout acute toxicity test.

Sample ID	Collection Date and Time	96-h LT50 (hours)
L1431509-1 (0167-140310-008)	March 10, 2014 @ N/A	>96

The test results presented above, for rainbow trout, met performance criteria and there were no deviations from the test methods. The results relate only to the sample tested.

Jacob Frank, B.Sc.
Laboratory Biologist

Reviewed By:
Julianna Kalocai, M.Sc., R.P.Bio
QA Officer

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: March 14/14 @ 0845

Work Order No.: 14107

Test Species: *Oncorhynchus mykiss*

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

Sample Information:

Sample ID: L1431509-1
Sample Date: March 10/14 @ N/A
Date Received: March 13/14 @ 1515
Sample Volume: 1x20L
Other: N/A

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 11
Alkalinity (mg/L $CaCO_3$): 9

Test Organism Information:

Batch No.: 01/14/14
Source: Vancouver Island Trout Hatchery
No. Fish/Volume (L): 10/15
Loading Density: 0.41
Mean Length ± SD (mm): 42 ± 3 Range: 37 - 46
Mean Weight ± SD (g): 0.61 ± 0.14 Range: 0.40 - 0.82

NaNO2 Reference Toxicant Results:

Reference Toxicant ID: RTNE55
Stock Solution ID: 13NE02
Date Initiated: February 19/14
96-h LC50 (95% CL): 4.7 (3.8 - 5.8) mg/L $NaNO_2$

Reference Toxicant Mean and Historical Range: 5.4 (2.2 - 13.4) mg/L $NaNO_2$
Reference Toxicant CV (%): 57

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

Reviewed by: JGH Date reviewed: March 27/14

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
Sample I.D. L1431509-1
W.O. # 14107
RBT Batch #: 01 14 14
Date Collected/Time: March 10/14 @ N/A
Date Setup/Time: ~~February~~ JBF 14/14 @ 0845
Sample Setup By: March JBF

D.O. meter: DO: 1/2/3
pH meter: pH: 1/2/3
Cond. Meter: C: 1/2/3

Number Fish/Volume: 10/15L
7-d % Mortality: 0.0
Total Pre-aeration Time (mins): 30
Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0		14.0
pH	6.8		6.9
D.O. (mg/L)	9.0		9.5
Cond. (µS/cm)	1777		1776

Concentration	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
(% v/v)	1	2	4	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	14.0	14.5	14.5	14.5	14.5	9.6	9.8	9.9	10.1	9.6	7.0	7.1	6.9	7.0	6.9	36	42
100	10	10	10	10	10	10	10	14.0	14.5	14.5	14.5	14.5	9.5	~~9.8~~ 9.9	9.6	9.8	9.7	6.9	7.6	7.6	8.3	8.2	1776	1761
														9.9										
Initials	JBF	JBF	JBF	"	"	JBF	JBF	JBF	"	"	JBF	JBF	JBF	"	"	JBF	JBF	JBF	"	"	JBF	JBF	JBF	JBF

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

Sample Description/Comments: Orange/Turb.J.

Fish Description at 96 h: All fish appear OK Number of Stressed Fish at 96 h: 0

Other Observations:

Reviewed by: JGH Date Reviewed: March 27/14

L1431509

VANCOUVER

ALS Environmental

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL
8664 COMMERCE COURT
BURNABY,BC V5A 4N7

NOTES: Please reference on final report and invoice: PO# *L1431509*
ALS requires QC data to be provided with your final results.

96-h RBT LT50

Please see enclosed 1 sample(s) in 1 Container(s) +2°C

SAMPLE NUMBER	CLIENT ID / ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1431509-1	0167-140310-008	3/10/2014	
	Special Request- Nautilus Environmental (SPECIAL REQUEST-NL 14)	3/19/2014	

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: Paul. Date Shipped: MAR 13/2014.

Received By: Ans Date Received: March 13/14 @

Verified By: _____ Date Verified: _____

Temperature: 12.8 °C

Sample Integrity Issues: 1+2°C OK

WO# 14107

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431509-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / Distribution	Select service level below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Meghan Marjanovic	Quality Control (QC) Report with Report ☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax mmarjanovic@edynamics.com	Specify Date Required for E2,E or P:
		Email 2	Analysis Request

Invoice To	Same as Report To ☐ Yes ☑ No	Invoice Distribution	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	
Company:	EDI	Email 1 or Fax sjenner@edynamics.com	
Contact:	S Jenner	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38399	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 13-Y-0167 / 14-Y-0233	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact: Sean Sluggett	Sampler: JM & DH

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	SPECIAL REQUEST-NL	Number of Containers
	0167-1403 10 - 008	10 - Mar - 14	18:00	Water	R	1

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No		Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ Yes ☐ No		Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
2.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Dana Hanna	11 March 14	18:16		11-Mar-14	12:20			

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

ALS-FM-0325e v09 Front/04 January 2014

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