ENVIRONMENTAL DYNAMICS INC.

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Whitehorse, YT Y1A 3T8
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August 10, 2014

EDI Job Number: 14-Y-0270

Assessment and Abandoned Mines
Yukon Government
Box 2703, K-419
Whitehorse, YT Y1A 2C6

Attention: Adrienne Turcotte, Project Officer

Re: Rose Creek Monitoring Program – June 09, 2014 (Revised)

Assessment and Abandoned Mines (AAM) retained EDI Environmental Dynamics Inc. (EDI) to conduct water quality sampling at the Faro Mine Site. The Rose Creek Monitoring Program has been ongoing since November 2013 in response to changing water quality conditions. Table 1, attached, summarizes the field trips completed for the 2014 fiscal year. The intent of this memo is to summarize field data obtained during the June 9, 2014 field trip.

The objective of this trip was to conduct surface water sampling at 10 monitoring sites, including QA/QC samples. Figure 1 provides the locations of all sampling sites. Table 2 summarizes field data collected at each sampling site. Representative photos of each site and the ALS laboratory analytical reports for all water chemistry samples submitted during this field trip are attached.

Weather conditions on June 09, 2014 were sunny with some cloud cover; air temperatures ranged from 15 to 20˚C. A total of 10 sites were sampled. The field crew experienced some uncertainty as to the exact location of NF2-A, as neither crew member had been to this site since the winter season. Upon returning from the field, the crew realized they sampled just downstream of the established monitoring site (Figure 1) and therefore submitted those samples as Site NF2-C.

Following a review of sample site photos and UTM coordinates, it was determined that NF2-A has shifted downstream approximately 5 m since becoming ice-free (May 13; Figure 2). It appears this location shift generally samples the same flow. The field crew will continue to sample the upper location until further notice.

If you have any questions, please do not hesitate to contact me at (867) 393-4882 or through email at mkearns@edynamics.com.

Yours truly,

EDI Environmental Dynamics Inc.

Submitted via email

Meighan Kearns, B.Sc., R.P.Bio.
Aquatic Biologist

Attachments:

- Table 1. Summary of field trips conducted in the 2014 fiscal year, Rose Creek Monitoring Program.
- Table 2. Surface water sampling field data, Rose Creek Monitoring Program, June 9, 2014.
- Figure 1. Location of surface water sampling, Rose Creek Monitoring Program, June 9, 2014.
- Figure 2. Locations of sampling history at NF2-A site.
- Photos 1 – 10. Representative site photos.
- ALS Laboratory Analytical Reports

Table 1. Summary of field trips conducted in the 2014 fiscal year, Rose Creek Monitoring Program.

Field Date	General Tasks
April 01, 2014	• Surface water sampling
April 08, 2014	• Surface water sampling
April 15, 2014	• Surface water sampling
April 22, 2014	• Surface water sampling
April 29, 2014	• Surface water sampling
May 06, 2014	• Surface water sampling
May 13, 2014	• Surface water sampling
May 20, 2014	• Surface water sampling
May 26-27, 2014	• Surface water sampling; AAM Faro Pelly Aquatics Program combo trip
June 09, 2014	• Surface water sampling

Table 2. Surface water sampling field data, Rose Creek Monitoring Program, June 9, 2014.

	UTM Location		Sample		QA/ QC	In-situ Parameters			
Site Name	Easting	Northing	Date	Time	Rep. ID	Temp (°C)	SPC (µS/cm)	pH	Turbidity (NTU)
R3	0527527	6916849	09-June-2014	14:30	-	7.2	326	7.34	1.48
X14	0579332	6915083	09-June-2014	15:17	-	7.2	347	7.39	1.04
X10	0579404	6914861	09-June-2014	15:50	-	7.3	230	7.80	1.28
X3A	0583154	6912543	09-June-2014	16:08	X3A-r	7.0	219.2	7.64	1.37
X2	0584069	6912772	09-June-2014	16:40	-	5.6	206.5	7.44	1.72
NF2-C	0584704	6913026	09-June-2014	17:20	-	5.8	214.6	7.38	1.47
NF2-B	0584728	6913038	09-June-2014	17:00	-	5.8	200	7.47	1.69
NF2	0584683	6913019	09-June-2014	17:30	-	6.0	217.7	7.40	1.71
NF1	0584896	6913270	09-June-2014	18:20	-	8.0	214.2	7.53	1.46
R10	0585100	6913489	09-June-2014	18:35	-	8.0	205.6	7.64	1.55

Where, UTM = Universal Transverse Mercator (NAD 83/ Zone 8);
QA/QC Rep = Quality Assurance/ Quality Control Replicate;
Temp = water temperature; and,
SPC = specific conductance.

575000 576000 577000 578000 579000 580000 581000 582000 583000 584000 585000 586000

6917000 6916000 6915000 6914000 6913000 6912000

R3

Rose Creek

X14

X10

Faro Pit

Rose Creek Diversion Channel

North Fork Rose Creek

R10

NF1

NF2

See inset

X2

X3A

HAUL ROAD

NF2-A

NF2-C

NF2-B

NF2

Inset: NF2 sites

Location of surface water sampling, Faro Mine Site, June 09, 2014

Legend

- Surface Water Sample Collected
- Not Sampled
- Road (Mine Access/Haul)
- Topographic Contour (30 m Interval)

N
W E
S

0 500 1,000 1,500 2,000
metres

Map Scale = 1:30,000 (printed on 11 x 17)
Map Projection: North American Datum 1983 UTM Zone 8N

Data sources

1:50,000 topographic spatial data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

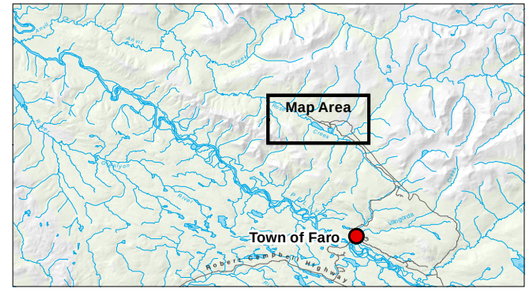
National Road Network courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Detailed toppgraphic features of the Faro, Grum and Vangorda mine sites were provided by Yukon Government - Energy, Mines and Resources - Assessment and Abandoned Mines Branch (March 2012).

Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. was obtained using Garmin GPS technology.

This document is not an official land survey and the spatial data presented is subject to change.

Drawn:	Checked:		
LG	MK	FIGURE 1	Date: 21/07/2014



EDI

Map Prepared by
EDI Environmental Dynamics Inc.

Path: J:\Yukon\Projects\2014\14_Y_0270_AAM_Faro_NFRCSampling\Mapping\Fig1_WaterSampling_21July2014.mxd

584700 584720 584740

6913040 6913020

May 13 to May 26

November 12 to May 6

June 9

Figure 2. Water Sampling Location NF-2A

Legend

- Surface Water Sampling Location
- Road (Mine Access/Haul)
- Topographic Contour (30 m Interval)
- Path of Flow (thicker line = more flow)
- Sampling Site

N W E S

0 5 10

metres

Map Scale = 1:160 (printed on 11 x 17)
Map Projection: North American Datum 1983 UTM Zone 8N

Data sources

1:50,000 topographic spatial data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

National Road Network courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

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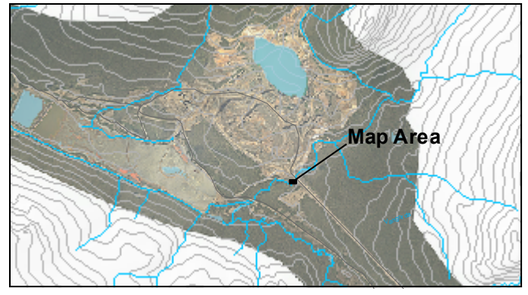
Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. was obtained using Garmin GPS technology.

This document is not an official land survey and the spatial data presented is subject to change.

Drawn:	Checked:		
MP	MK	FIGURE 2	Date: 19/06/2014



EDI

Map Prepared by
EDI Environmental Dynamics Inc.

Path: J:\Yukon\Projects\2014\14_Y_0270_AAM_Faro_NFRCSampling\Mapping\Fig2_SamplingSite_NF2A.mxd

Site Photos

Photo 1. Downstream view at surface water sampling site R3, June 09, 2014

Photo 2. Downstream view at surface water sampling site X14, June 09, 2014.

Photo 3. Downstream view at surface water sampling site X10, June 09, 2014.

Photo 4. Upstream view from surface water sampling site X3A, June 09, 2014.

Photo 5. Upstream view at surface water sampling site X2, June 09, 2014.

Photo 6. Upstream view from surface water sampling site NF2-C, June 09, 2014.

Photo 7. Overview at surface water sampling site NF2-B, June 09, 2014.

Photo 8. Upstream view at surface water sampling site NF2, June 09, 2014.

Photo 9. Downstream view at surface water sampling site NF1, June 09, 2014.

Photo 10. Upstream view at surface water sampling site R10, June 09, 2014.

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

Date Received: 10-JUN-14
Report Date: 03-JUL-14 17:22 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1468264

Project P.O. #: NOT SUBMITTED
Job Reference: 14-Y-270
C of C Numbers: 1
Legal Site Desc:

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-1 Surface Water 09-JUN-14 14:30 R3	L1468264-2 Surface Water 09-JUN-14 15:50 X10	L1468264-3 Surface Water 09-JUN-14 15:17 X14	L1468264-4 Surface Water 09-JUN-14 16:08 X3A	L1468264-5 Surface Water 09-JUN-14 16:40 X2
Sample ID / **Description** / **Sampled Date** / **Sampled Time** / **Client ID**						
WATER						
Physical Tests	Conductivity (uS/cm)	160	118	178	111	107
	Hardness (as CaCO3) (mg/L)	78.6	57.9	84.2	53.5	52.6
	pH (pH)	7.78	7.87	7.75	7.73	7.69
	Total Suspended Solids (mg/L)	2.2	<1.0	1.4	2.4	3.8
	Total Dissolved Solids (mg/L)	101	71.4	109	67.2	63.3
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	62.2	58.1	63.6	53.7	49.1
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	0.0089	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.075	0.075	0.076	0.073	0.070
	Nitrate (as N) (mg/L)	0.0181	0.0181	0.0197	0.0233	0.0196
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0023	0.0035	<0.0020	0.0052	0.0063
	Sulfate (SO4) (mg/L)	29.6	10.8	34.2	10.3	9.64
	Anion Sum (meq/L)	1.87	1.39	1.99	1.29	1.19
	Cation Sum (meq/L)	1.69	1.24	1.81	1.15	1.14
	Cation - Anion Balance (%)	-5.1	-5.8	-4.8	-5.7	-2.2
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.81	2.93	2.76	3.19	3.88
	Total Organic Carbon (mg/L)	3.06	2.87	2.85	3.21	3.29
Total Metals	Aluminum (Al)-Total (mg/L)	0.0566	0.0561	0.0511	0.0608	0.109
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00042	0.00043	0.00046	0.00046	0.00057
	Barium (Ba)-Total (mg/L)	0.0289	0.0297	0.0303	0.0288	0.0306
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000041	0.000036	0.000045	0.000040	0.000081
	Calcium (Ca)-Total (mg/L)	22.4	15.3	23.2	14.6	14.5
	Chromium (Cr)-Total (mg/L)	0.00018	0.00018	0.00018	0.00020	0.00029
	Cobalt (Co)-Total (mg/L)	0.00044	0.00023	0.00062	0.00028	0.00053
	Copper (Cu)-Total (mg/L)	0.00081	0.00082	0.00081	0.00081	0.00094
	Iron (Fe)-Total (mg/L)	0.228	0.214	0.270	0.233	0.264
	Lead (Pb)-Total (mg/L)	0.000583	0.000640	0.000752	0.000832	0.00149
	Lithium (Li)-Total (mg/L)	0.00143	0.00119	0.00144	0.00121	0.00173
	Magnesium (Mg)-Total (mg/L)	4.86	3.87	5.55	3.33	3.49
	Manganese (Mn)-Total (mg/L)	0.367	0.0235	0.523	0.0311	0.0398
	Molybdenum (Mo)-Total (mg/L)	0.000345	0.000338	0.000330	0.000302	0.000348

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-6 Surface Water 09-JUN-14 17:00 NF2B	L1468264-7 Surface Water 09-JUN-14 17:20 NF2C	L1468264-8 Surface Water 09-JUN-14 17:30 NF2	L1468264-9 Surface Water 09-JUN-14 18:20 NF1	L1468264-10 Surface Water 09-JUN-14 18:35 R10
WATER						
Physical Tests	Conductivity (uS/cm)	105	112	114	104	105
	Hardness (as CaCO3) (mg/L)	49.3	51.9	53.2	51.3	51.2
	pH (pH)	7.60	7.46	7.48	7.56	7.65
	Total Suspended Solids (mg/L)	4.2	3.8	3.4	3.4	2.6
	Total Dissolved Solids (mg/L)	60.6	66.2	66.7	61.5	67.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	49.8	49.7	49.9	48.6	58.9
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.083	0.078	0.076	0.070	0.071
	Nitrate (as N) (mg/L)	0.0256	0.0258	0.0243	0.0157	0.0229
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0052	0.0054	0.0051	0.0067	0.0044
	Sulfate (SO4) (mg/L)	7.73	12.3	12.3	8.76	7.97
	Anion Sum (meq/L)	1.16	1.25	1.26	1.16	1.35
	Cation Sum (meq/L)	1.06	1.13	1.16	1.10	1.10
	Cation - Anion Balance (%)	-4.7	-5.2	-4.2	-2.5	-10.1
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	3.27	3.14	3.18	3.24	3.15
	Total Organic Carbon (mg/L)	3.30	3.30	3.17	3.22	3.34
Total Metals	Aluminum (Al)-Total (mg/L)	0.132	0.115	0.114	0.0773	0.0710
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00060	0.00056	0.00056	0.00054	0.00056
	Barium (Ba)-Total (mg/L)	0.0310	0.0316	0.0323	0.0314	0.0321
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000019	0.000272	0.000260	0.000015	0.000012
	Calcium (Ca)-Total (mg/L)	13.9	14.7	14.7	14.3	15.4
	Chromium (Cr)-Total (mg/L)	0.00032	0.00028	0.00026	0.00030	0.00020
	Cobalt (Co)-Total (mg/L)	0.00012	0.00180	0.00169	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.00100	0.00103	0.00110	0.00105	0.00094
	Iron (Fe)-Total (mg/L)	0.264	0.302	0.286	0.178	0.165
	Lead (Pb)-Total (mg/L)	0.00170	0.00227	0.00167	0.00119	0.000840
	Lithium (Li)-Total (mg/L)	0.00168	0.00213	0.00205	0.00174	0.00184
	Magnesium (Mg)-Total (mg/L)	3.15	4.19	3.97	3.33	3.53
	Manganese (Mn)-Total (mg/L)	0.0170	0.0979	0.0926	0.0167	0.0133
	Molybdenum (Mo)-Total (mg/L)	0.000331	0.000381	0.000352	0.000338	0.000350

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1468264-11	L1468264-12	L1468264-13		
	Description	Surface Water	Surface Water	Surface Water		
	Sampled Date	09-JUN-14	10-JUN-14	10-JUN-14		
	Sampled Time	19:00	13:05	13:05		
	Client ID	BLANK	TRAVEL BLANK	X3A-R		
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0	111		
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50	53.6		
	pH (pH)	5.61	5.49	7.64		
	Total Suspended Solids (mg/L)	<1.0	<1.0	1.4		
	Total Dissolved Solids (mg/L)	<1.0	<1.0	72.5		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	63.2		
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	<0.020	<0.020	0.073		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	0.0179		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020	0.0041		
	Sulfate (SO4) (mg/L)	<0.50	<0.50	10.3		
	Anion Sum (meq/L)	<0.10	<0.10	1.48		
	Cation Sum (meq/L)	<0.10	<0.10	1.16		
	Cation - Anion Balance (%)	0.0	0.0	-12.4		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50		2.84		
	Total Organic Carbon (mg/L)	<0.50	<0.50	2.85		
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	<0.0030	0.0896		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	0.00049		
	Barium (Ba)-Total (mg/L)	<0.000050	<0.000050	0.0309		
	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)	<0.000010	<0.000010	0.000050		
	Calcium (Ca)-Total (mg/L)	<0.020	<0.020	15.1		
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	0.00051		
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	0.00034		
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	0.00089		
	Iron (Fe)-Total (mg/L)	<0.010	<0.010	0.290		
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.00116		
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	0.00159		
	Magnesium (Mg)-Total (mg/L)	<0.0050	<0.0050	3.60		
	Manganese (Mn)-Total (mg/L)	<0.000050	<0.000050	0.0346		
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	0.000280		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-1 Surface Water 09-JUN-14 14:30 R3	L1468264-2 Surface Water 09-JUN-14 15:50 X10	L1468264-3 Surface Water 09-JUN-14 15:17 X14	L1468264-4 Surface Water 09-JUN-14 16:08 X3A	L1468264-5 Surface Water 09-JUN-14 16:40 X2
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.00123	0.00082	0.00152	0.00081	0.00126
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.641	0.539	0.642	0.549	0.496
	Selenium (Se)-Total (mg/L)	0.00020	0.00020	0.00021	0.00018	0.00024
	Silicon (Si)-Total (mg/L)	3.46	3.15	3.23	3.24	3.71
	Silver (Ag)-Total (mg/L)	0.000015	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	1.70	1.32	1.71	1.29	1.35
	Strontium (Sr)-Total (mg/L)	0.0900	0.0748	0.0975	0.0727	0.0672
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000783	0.000777	0.000913	0.000735	0.000629
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0402	0.0529	0.0516	0.0625	0.106
	Zirconium (Zr)-Total (mg/L)	0.00133	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0155	0.0162	0.0153	0.0166	0.0288
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00027	0.00030	0.00032	0.00033	0.00040
	Barium (Ba)-Dissolved (mg/L)	0.0283	0.0292	0.0295	0.0284	0.0301
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000033	0.000034	0.000045	0.000041	0.000080
	Calcium (Ca)-Dissolved (mg/L)	23.0	16.6	24.4	15.8	14.8
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00039	0.00019	0.00058	0.00024	0.00047
	Copper (Cu)-Dissolved (mg/L)	0.00067	0.00068	0.00068	0.00067	0.00078
	Iron (Fe)-Dissolved (mg/L)	0.112	0.110	0.154	0.115	0.077
	Lead (Pb)-Dissolved (mg/L)	0.000193	0.000291	0.000222	0.000257	0.000408
	Lithium (Li)-Dissolved (mg/L)	0.00177	0.00152	0.00205	0.00188	0.00194
	Magnesium (Mg)-Dissolved (mg/L)	5.13	4.01	5.63	3.45	3.77
	Manganese (Mn)-Dissolved (mg/L)	0.363	0.0200	0.528	0.0268	0.0328
	Molybdenum (Mo)-Dissolved (mg/L)	0.000318	0.000317	0.000330	0.000267	0.000320
	Nickel (Ni)-Dissolved (mg/L)	0.00115	0.00072	0.00150	0.00072	0.00110
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	0.669	0.551	0.664	0.561	0.527

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-6 Surface Water 09-JUN-14 17:00 NF2B	L1468264-7 Surface Water 09-JUN-14 17:20 NF2C	L1468264-8 Surface Water 09-JUN-14 17:30 NF2	L1468264-9 Surface Water 09-JUN-14 18:20 NF1	L1468264-10 Surface Water 09-JUN-14 18:35 R10
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.00068	0.00300	0.00288	0.00060	0.00052
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.503	0.524	0.522	0.523	0.510
	Selenium (Se)-Total (mg/L)	0.00022	0.00023	0.00023	0.00022	0.00023
	Silicon (Si)-Total (mg/L)	3.69	3.82	3.77	3.68	3.88
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000041	<0.000010
	Sodium (Na)-Total (mg/L)	1.27	1.39	1.34	1.33	1.39
	Strontium (Sr)-Total (mg/L)	0.0640	0.0661	0.0669	0.0623	0.0657
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000635	0.000696	0.000672	0.000600	0.000699
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0051	0.413	0.381	0.0072	0.0043
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0197	0.0233	0.0224	0.0215	0.0229
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00041	0.00037	0.00038	0.00039	0.00041
	Barium (Ba)-Dissolved (mg/L)	0.0293	0.0294	0.0295	0.0313	0.0299
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000262	0.000233	0.000012	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	14.4	14.1	14.7	15.0	14.9
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00170	0.00155	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00073	0.00077	0.00074	0.00078	0.00073
	Iron (Fe)-Dissolved (mg/L)	0.059	0.116	0.108	0.065	0.065
	Lead (Pb)-Dissolved (mg/L)	0.000382	0.000527	0.000503	0.000401	0.000431
	Lithium (Li)-Dissolved (mg/L)	0.00211	0.00218	0.00205	0.00224	0.00222
	Magnesium (Mg)-Dissolved (mg/L)	3.23	4.03	4.03	3.38	3.41
	Manganese (Mn)-Dissolved (mg/L)	0.00408	0.0888	0.0820	0.0142	0.00878
	Molybdenum (Mo)-Dissolved (mg/L)	0.000319	0.000329	0.000313	0.000325	0.000336
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00276	0.00263	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	0.485	0.499	0.502	0.507	0.493

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-11 Surface Water 09-JUN-14 19:00 BLANK	L1468264-12 Surface Water 10-JUN-14 13:05 TRAVEL BLANK	L1468264-13 Surface Water 10-JUN-14 13:05 X3A-R		
	Sample ID					
	Description					
	Sampled Date					
	Sampled Time					
	Client ID					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.00102		
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Total (mg/L)	<0.050	<0.050	0.590		
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	0.00016		
	Silicon (Si)-Total (mg/L)	<0.050	<0.050	3.57		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	<0.050	<0.050	1.44		
	Strontium (Sr)-Total (mg/L)	<0.00020	<0.00020	0.0750		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.000010	<0.000010	0.000791		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	0.0680		
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080		
Dissolved Metals	Dissolved Metals Filtration Location	FIELD		FIELD		
	Aluminum (Al)-Dissolved (mg/L)	<0.0010		0.0172		
	Antimony (Sb)-Dissolved (mg/L)	<0.00010		<0.00010		
	Arsenic (As)-Dissolved (mg/L)	<0.00010		0.00032		
	Barium (Ba)-Dissolved (mg/L)	<0.000050		0.0285		
	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)	<0.000010		0.000041		
	Calcium (Ca)-Dissolved (mg/L)	<0.020		15.6		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010		<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	<0.00010		0.00025		
	Copper (Cu)-Dissolved (mg/L)	<0.00020		0.00066		
	Iron (Fe)-Dissolved (mg/L)	<0.010		0.115		
	Lead (Pb)-Dissolved (mg/L)	<0.000050		0.000249		
	Lithium (Li)-Dissolved (mg/L)	<0.00050		0.00203		
	Magnesium (Mg)-Dissolved (mg/L)	<0.0050		3.56		
	Manganese (Mn)-Dissolved (mg/L)	<0.000050		0.0262		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050		0.000263		
	Nickel (Ni)-Dissolved (mg/L)	<0.00050		0.00074		
	Phosphorus (P)-Dissolved (mg/L)	<0.30		<0.30		
	Potassium (K)-Dissolved (mg/L)	<0.050		0.556		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-1 Surface Water 09-JUN-14 14:30 R3	L1468264-2 Surface Water 09-JUN-14 15:50 X10	L1468264-3 Surface Water 09-JUN-14 15:17 X14	L1468264-4 Surface Water 09-JUN-14 16:08 X3A	L1468264-5 Surface Water 09-JUN-14 16:40 X2
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00020	0.00021	0.00021	0.00016	0.00021
	Silicon (Si)-Dissolved (mg/L)	3.58	3.28	3.31	3.35	3.63
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.71	1.33	1.76	1.35	1.38
	Strontium (Sr)-Dissolved (mg/L)	0.0896	0.0772	0.0970	0.0774	0.0620
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000786	0.000743	0.000897	0.000743	0.000612
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0389	0.0536	0.0519	0.0629	0.114
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1468264-6 Surface Water 09-JUN-14 17:00 NF2B	L1468264-7 Surface Water 09-JUN-14 17:20 NF2C	L1468264-8 Surface Water 09-JUN-14 17:30 NF2	L1468264-9 Surface Water 09-JUN-14 18:20 NF1	L1468264-10 Surface Water 09-JUN-14 18:35 R10
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00024	0.00022	0.00023	0.00022	0.00024
	Silicon (Si)-Dissolved (mg/L)	3.70	3.62	3.68	3.62	3.76
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.28	1.32	1.34	1.32	1.36
	Strontium (Sr)-Dissolved (mg/L)	0.0615	0.0620	0.0628	0.0644	0.0641
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000617	0.000626	0.000642	0.000602	0.000676
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0035	0.416	0.386	0.0054	0.0039
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1468264-11	L1468264-12	L1468264-13		
	Description	Surface Water	Surface Water	Surface Water		
	Sampled Date	09-JUN-14	10-JUN-14	10-JUN-14		
	Sampled Time	19:00	13:05	13:05		
	Client ID	BLANK	TRAVEL BLANK	X3A-R		
Grouping	**Analyte**					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	<0.00010		0.00018		
	Silicon (Si)-Dissolved (mg/L)	<0.050		3.41		
	Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		
	Sodium (Na)-Dissolved (mg/L)	<0.050		1.37		
	Strontium (Sr)-Dissolved (mg/L)	<0.00020		0.0733		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010		<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)	<0.000010		0.000735		
	Vanadium (V)-Dissolved (mg/L)	<0.0010		<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	<0.0010		0.0633		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080		<0.00080		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Beryllium (Be)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cobalt (Co)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Copper (Cu)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Phosphorus (P)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Selenium (Se)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Thallium (Tl)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Vanadium (V)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)-Total	DLA	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1468264-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1468264-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Antimony (Sb)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Dissolved Organic Carbon	MS-B	L1468264-10, -11, -13, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Total	MS-B	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Total	MS-B	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1468264-1, -10, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1468264-1, -10, -11, -13, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

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

Reference Information

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.

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

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.

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.

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-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).

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.

P-T-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

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."

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

Reference Information

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

TSS-LOW-WR Water Total Suspended Solids by Grav. (1 mg/L) 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.

ZR-D-MS-VA Water Dissolved Zr in Water by ICPMS EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

ZR-T-MS-VA Water Total Zr in Water by ICPMS EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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

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

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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

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

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1468264-COFC

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	
Company:	EDI	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Contact:	Meighan Kearns	Quality Control (QC) Report with Report	☐ Yes ☐ No
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked	
Phone:	867-393-4882	Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
		Email 1 or Fax	mkearns@edynamics.com
		Email 2	adrienne.turcotte@gov.yk.ca

Invoice To	Same as Report To	☐ Yes ☑ No
	Copy of Invoice with Report	☑ Yes ☐ No
Company:	EDI	
Contact:	S Jenner	

Invoice Distribution	
Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	sjenner@edynamics.com
Email 2	

Project Information	
ALS Quote #:	Q38556
Job #:	14-Y-270
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
Approver ID:	Cost Center:
GL Account:	Routing Code:
Activity Code:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

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

- R ☑ Regular (Standard TAT if received by 3 pm - business days)
- P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
- 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

Specify Date Required for E2,E or P:

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-COL-VA,P-T-COL-VA,IONBALANCE-VA	ANIONS-ALL-IC-WR, TDS-CALC-VA	EC-MAN-WR,PH-MAN-WR	TSS-LOW-WR	CARBONS-TOC-VA,NH3-F-VA	CARBONS-DOC-VA	MET-T-CCMS-VA,ZR-T-MS-VA	MET-D-CCMS-VA,ZR-D-MS-VA	HARDNESS-CALC-VA	Number of Containers
	R3	09/Jun/14	14:30		R	R	R	R	R	R	R	R	R	5
	X10	09/Jun/14	15:50											
	X14	09/Jun/14	15:17											
	X3A	09/Jun/14	16:08											
	X2	09/Jun/14	16:40											
	NF2B	09/Jun/14	17:00											
	NF2A	09/Jun/14	17:20											
	NF2	09/Jun/14	17:30											
	NF1	09/Jun/14	18:20											
	R10	09/Jun/14	18:35											
	Blank	09/Jun/14	19:00											

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	Use CH2M_EQUIS for EDD.
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	
2.5	2.1		

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:
	10/Jun/14	13:00		10 JUN 14	1105			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS FM-032be 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.