HEMMERA ENVIROCHEM INC.
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Whitehorse YK Y1A 0K7

Date Received: 28-JUN-14
Report Date: 10-JUL-14 17:11 (MT)
Version: FINAL

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1478694

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.03
C of C Numbers: 1, 2
Legal Site Desc:

Brent Mack
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-1 Water 27-JUN-14 08:18 CH-P-13-05/50	L1478694-2 Water 27-JUN-14 08:18 DUP-2	L1478694-3 Water 27-JUN-14 14:42 MP09-08	L1478694-4 Water 27-JUN-14 10:52 MP09-02	L1478694-5 Water 27-JUN-14 07:10 GLL07-03
WATER						
Physical Tests	Conductivity (uS/cm)	2690	2690	705	512	1640
	Hardness (as CaCO3) (mg/L)	1810	1830	408	276	974
	pH (pH)	7.05	7.08	8.05	7.99	7.15
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	116	115	226	121	74.8
	Ammonia, Total (as N) (mg/L)	0.0349	0.0355	0.0309	0.0055	0.185
	Chloride (Cl) (mg/L)	<10 DLA	<10 DLA	<0.50	<0.50	<5.0 DLA
	Fluoride (F) (mg/L)	<0.40 DLA	<0.40 DLA	0.078	0.061	<0.20 DLA
	Nitrate (as N) (mg/L)	0.42	0.40	<0.0050	0.0717	<0.050 DLA
	Nitrite (as N) (mg/L)	<0.020 DLA	<0.020 DLA	<0.0010	<0.0010	<0.010 DLA
	Total Kjeldahl Nitrogen (mg/L)	0.121	0.131	0.247	0.251	0.650
	Sulfate (SO4) (mg/L)	1850	1850	180	159	991
	Sulphide as S (mg/L)	<0.020	<0.020	0.108	<0.020	0.384
	Anion Sum (meq/L)	40.9	40.8	8.27	5.74	22.1
	Cation Sum (meq/L)	39.1	39.6	8.53	5.74	21.5
	Cation - Anion Balance (%)	-2.3	-1.5	1.5	0.0	-1.5
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	16.5	16.4	49.5	25.3	9.95
	Total Organic Carbon (mg/L)	2.05	2.03	5.01	6.39	3.6
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-6 Water 26-JUN-14 15:34 MW09-19	L1478694-7 Water 26-JUN-14 15:34 FB-1	L1478694-8 Water 26-JUN-14 13:40 MW09-16	L1478694-9 Water 26-JUN-14 13:40 DUP-1	L1478694-10 Water 26-JUN-14 16:57 MW09-18
WATER						
Physical Tests	Conductivity (uS/cm)	2290	<2.0	1710	1710	2580
	Hardness (as CaCO3) (mg/L)	1530	<0.50	1130	1140	1860
	pH (pH)	7.54	5.40	7.74	7.84	7.81
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	443	<2.0	312	314	464
	Ammonia, Total (as N) (mg/L)	2.05 DLA	<0.0050	<0.0050 DLA	<0.0050 DLA	0.0231 DLA
	Chloride (Cl) (mg/L)	<10 DLA	<0.50	<5.0 DLA	<5.0 DLA	<10 DLA
	Fluoride (F) (mg/L)	<0.40 DLA	<0.020	<0.20 DLA	<0.20 DLA	<0.40 DLA
	Nitrate (as N) (mg/L)	<0.10 DLA	<0.0050	0.247 DLA	0.242 DLA	<0.10 DLA
	Nitrite (as N) (mg/L)	<0.020	<0.0010	<0.010	<0.010	<0.020
	Total Kjeldahl Nitrogen (mg/L)	2.99	<0.050	0.121	0.133	0.137
	Sulfate (SO4) (mg/L)	1130	<0.50	835	833	1410
	Sulphide as S (mg/L)	0.195	<0.020	<0.020	<0.020	<0.020
	Anion Sum (meq/L)	32.5	<0.10	23.6	23.6	38.7
	Cation Sum (meq/L)	32.8	<0.10	23.1	23.2	37.8
	Cation - Anion Balance (%)	0.4	0.0	-1.1	-0.8	-1.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	98.1	<0.50	63.9	65.9	102
	Total Organic Carbon (mg/L)	13.1	<0.50	2.96	2.84	2.57
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-11 Water 27-JUN-14 15:09 MW09-04	L1478694-12 Water 27-JUN-14 13:23 MW09-02	L1478694-13 Water 27-JUN-14 13:23 DUP-3	L1478694-14 Water 27-JUN-14 16:08 MW09-03	L1478694-15 Water 27-JUN-14 16:50 MW09-22
WATER						
Physical Tests	Conductivity (uS/cm)	2680	2840	2810	2520	3020
	Hardness (as CaCO3) (mg/L)	1720	1580	1560	1560	1700
	pH (pH)	7.96	6.96	6.95	7.84	6.52
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	97.6	34.5	36.0	155	35.7
	Ammonia, Total (as N) (mg/L)	6.82	12.1	12.3	2.37	2.27
	Chloride (Cl) (mg/L)	<10 DLA	<10 DLA	<10 DLA	<10 DLA	<10 DLA
	Fluoride (F) (mg/L)	<0.40 DLA	0.47	0.46	<0.40 DLA	<0.40 DLA
	Nitrate (as N) (mg/L)	0.31	<0.10 DLA	<0.10 DLA	<0.10 DLA	11.9
	Nitrite (as N) (mg/L)	0.059	<0.020 DLA	<0.020 DLA	<0.020 DLA	0.326
	Total Kjeldahl Nitrogen (mg/L)	7.94	16.3	16.5	3.19	10.6
	Sulfate (SO4) (mg/L)	1750	1860	1830	1640	1990
	Sulphide as S (mg/L)	<0.020	<0.020	<0.020	<0.020	0.023
	Anion Sum (meq/L)	38.4	39.5	38.8	37.3	43.1
	Cation Sum (meq/L)	37.9	40.0	39.7	34.9	43.3
	Cation - Anion Balance (%)	-0.7	0.7	1.1	-3.3	0.2
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	0.0076	0.0211	0.0129	0.0132
	Cyanide, Total (mg/L)	<0.0050	0.0557	0.0944	0.0437	0.0225
	Thiocyanate (SCN) (mg/L)	<0.50	1.36	1.35	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	0.0091	0.0096
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	14.4	8.2	6.3	27.9	4.9 RRA
	Total Organic Carbon (mg/L)	5.88	5.82	5.92	6.7	10.8
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478694-16	L1478694-17			
	Description	Water	Water			
	Sampled Date	27-JUN-14	28-JUN-14			
	Sampled Time	16:50				
	Client ID	FB-2	TRAVEL BLANK			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0			
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50			
	pH (pH)	5.30	5.23			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0			
	Ammonia, Total (as N) (mg/L)	<0.0050	0.0077 RRV			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
	Sulphide as S (mg/L)	<0.020	<0.020			
	Anion Sum (meq/L)	<0.10	<0.10			
	Cation Sum (meq/L)	<0.10	<0.10			
	Cation - Anion Balance (%)	0.0	0.0			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050			
	Cyanide, Total (mg/L)	<0.0050	<0.0050			
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50			
	Cyanide, Free (mg/L)	<0.0050	<0.0050			
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	<0.50	<0.50			
	Total Organic Carbon (mg/L)	<0.50	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)		<0.0030			
	Antimony (Sb)-Total (mg/L)		<0.00010			
	Arsenic (As)-Total (mg/L)		<0.00010			
	Barium (Ba)-Total (mg/L)		<0.000050			
	Beryllium (Be)-Total (mg/L)		<0.00010			
	Bismuth (Bi)-Total (mg/L)		<0.00050			
	Boron (B)-Total (mg/L)		<0.010			
	Cadmium (Cd)-Total (mg/L)		<0.000010			
	Calcium (Ca)-Total (mg/L)		<0.050			
	Chromium (Cr)-Total (mg/L)		<0.00010			
	Cobalt (Co)-Total (mg/L)		<0.00010			
	Copper (Cu)-Total (mg/L)		<0.00050			
	Iron (Fe)-Total (mg/L)		<0.010			
	Lead (Pb)-Total (mg/L)		<0.000050			
	Lithium (Li)-Total (mg/L)		<0.00050			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478694-1	L1478694-2	L1478694-3	L1478694-4	L1478694-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	27-JUN-14	27-JUN-14	27-JUN-14	27-JUN-14	27-JUN-14
	Sampled Time	08:18	08:18	14:42	10:52	07:10
	Client ID	CH-P-13-05/50	DUP-2	MP09-08	MP09-02	GLL07-03
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
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)	0.0444	0.0461	0.0038	0.0056	0.0344
	Antimony (Sb)-Dissolved (mg/L)	<0.00050 DLA	<0.00050 DLA	<0.00010	0.00067	<0.00050 DLA
	Arsenic (As)-Dissolved (mg/L)	0.00284	0.00259	0.0111	0.00156	<0.00050 DLA
	Barium (Ba)-Dissolved (mg/L)	0.0111	0.0115	0.0430	0.0553	0.00967
	Beryllium (Be)-Dissolved (mg/L)	<0.00050 DLA	<0.00050 DLA	<0.00010	<0.00010	<0.00050 DLA
	Bismuth (Bi)-Dissolved (mg/L)	<0.0025 DLA	<0.0025 DLA	<0.00050	<0.00050	<0.0025 DLA
	Boron (B)-Dissolved (mg/L)	<0.050 DLA	<0.050 DLA	<0.010	<0.010	<0.050 DLA
	Cadmium (Cd)-Dissolved (mg/L)	0.271	0.272	<0.000010	0.000054	0.945
	Calcium (Ca)-Dissolved (mg/L)	449	457	113	81.3	294
	Chromium (Cr)-Dissolved (mg/L)	<0.00050 DLA	<0.00050 DLA	<0.00010	<0.00010	<0.00050 DLA
	Cobalt (Co)-Dissolved (mg/L)	0.0322	0.0322	0.00056	0.00015	0.0238
	Copper (Cu)-Dissolved (mg/L)	0.131	0.130	<0.00020	0.00080	<0.0010 DLA
	Iron (Fe)-Dissolved (mg/L)	7.72	7.77	0.795	0.041	1.75
	Lead (Pb)-Dissolved (mg/L)	0.00396	0.00385	<0.000050	<0.000050	0.00049
	Lithium (Li)-Dissolved (mg/L)	0.0319	0.0316	0.00395	0.00091	0.0245
	Magnesium (Mg)-Dissolved (mg/L)	167	167	30.9	17.8	58.4

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-6 Water 26-JUN-14 15:34 MW09-19	L1478694-7 Water 26-JUN-14 15:34 FB-1	L1478694-8 Water 26-JUN-14 13:40 MW09-16	L1478694-9 Water 26-JUN-14 13:40 DUP-1	L1478694-10 Water 26-JUN-14 16:57 MW09-18
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
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)	0.0109	<0.0010	0.0023	0.0020	<0.0020 DLA
	Antimony (Sb)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	0.0634	0.0690	0.00022
	Arsenic (As)-Dissolved (mg/L)	0.0779	<0.00010	0.00902	0.00868	0.0537
	Barium (Ba)-Dissolved (mg/L)	0.0488	<0.000050	0.0137	0.0137	0.00830
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 DLA	<0.00050	<0.00050	<0.00050	<0.0010 DLA
	Boron (B)-Dissolved (mg/L)	0.437	<0.010	0.131	0.143	<0.020 DLA
	Cadmium (Cd)-Dissolved (mg/L)	<0.000020 DLA	<0.000010	0.0249	0.0246	0.000058
	Calcium (Ca)-Dissolved (mg/L)	326	<0.050	262	265	357
	Chromium (Cr)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Cobalt (Co)-Dissolved (mg/L)	0.00204	<0.00010	0.00018	0.00018	<0.00020 DLA
	Copper (Cu)-Dissolved (mg/L)	<0.00040 DLA	<0.00020	0.00558	0.00552	<0.00040 DLA
	Iron (Fe)-Dissolved (mg/L)	18.5	<0.010	<0.010	<0.010	<0.010
	Lead (Pb)-Dissolved (mg/L)	<0.00010 DLA	<0.000050	0.00690	0.00784	<0.00010 DLA
	Lithium (Li)-Dissolved (mg/L)	0.0108	<0.00050	0.00860	0.00946	0.0202
	Magnesium (Mg)-Dissolved (mg/L)	174	<0.10	115	115	235

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-11 Water 27-JUN-14 15:09 MW09-04	L1478694-12 Water 27-JUN-14 13:23 MW09-02	L1478694-13 Water 27-JUN-14 13:23 DUP-3	L1478694-14 Water 27-JUN-14 16:08 MW09-03	L1478694-15 Water 27-JUN-14 16:50 MW09-22
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
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)	<0.0020 DLA	<0.0050 DLA	<0.0050 DLA	<0.0050 DLA	0.0396
	Antimony (Sb)-Dissolved (mg/L)	0.342	0.00345	0.00343	0.503	0.00027
	Arsenic (As)-Dissolved (mg/L)	3.83	20.3	19.7	1.28	0.00666
	Barium (Ba)-Dissolved (mg/L)	0.00600	0.00688	0.00638	0.0364	0.0554
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 DLA	<0.00050 DLA	<0.00050 DLA	<0.00050 DLA	<0.00020 DLA
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 DLA	<0.0025 DLA	<0.0025 DLA	<0.0025 DLA	<0.0010 DLA
	Boron (B)-Dissolved (mg/L)	0.247	0.058	0.059	0.126	0.024
	Cadmium (Cd)-Dissolved (mg/L)	0.000037	0.000627	0.000630	0.000895	0.000094
	Calcium (Ca)-Dissolved (mg/L)	487	473	470	477	587
	Chromium (Cr)-Dissolved (mg/L)	<0.00020 DLA	<0.00050 DLA	<0.00050 DLA	<0.00050 DLA	0.00034
	Cobalt (Co)-Dissolved (mg/L)	0.00100	0.0115	0.0116	0.00422	0.0153
	Copper (Cu)-Dissolved (mg/L)	<0.00040 DLA	<0.0010 DLA	<0.0010 DLA	<0.0010 DLA	0.00112
	Iron (Fe)-Dissolved (mg/L)	<0.010	37.0	36.8	0.218	87.4
	Lead (Pb)-Dissolved (mg/L)	0.00022	<0.00025 DLA	0.00032	<0.00025 DLA	0.00020
	Lithium (Li)-Dissolved (mg/L)	0.0056	0.0192	0.0200	<0.0025 DLA	<0.0010 DLA
	Magnesium (Mg)-Dissolved (mg/L)	121	96.6	95.0	90.5	57.5

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478694-16	L1478694-17			
	Description	Water	Water			
	Sampled Date	27-JUN-14	28-JUN-14			
	Sampled Time	16:50				
	Client ID	FB-2	TRAVEL BLANK			
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)		<0.10			
	Manganese (Mn)-Total (mg/L)		<0.000050			
	Mercury (Hg)-Total (mg/L)		<0.000010			
	Molybdenum (Mo)-Total (mg/L)		<0.000050			
	Nickel (Ni)-Total (mg/L)		<0.00050			
	Phosphorus (P)-Total (mg/L)		<0.050			
	Potassium (K)-Total (mg/L)		<0.10			
	Selenium (Se)-Total (mg/L)		<0.00010			
	Silicon (Si)-Total (mg/L)		<0.050			
	Silver (Ag)-Total (mg/L)		<0.000010			
	Sodium (Na)-Total (mg/L)		<0.050			
	Strontium (Sr)-Total (mg/L)		<0.00020			
	Sulfur (S)-Total (mg/L)		<0.50			
	Thallium (Tl)-Total (mg/L)		<0.000010			
	Tin (Sn)-Total (mg/L)		<0.00010			
	Titanium (Ti)-Total (mg/L)		<0.010			
	Uranium (U)-Total (mg/L)		<0.000010			
	Vanadium (V)-Total (mg/L)		<0.0010			
	Zinc (Zn)-Total (mg/L)		<0.0030			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	<0.0010				
	Antimony (Sb)-Dissolved (mg/L)	<0.00010				
	Arsenic (As)-Dissolved (mg/L)	<0.00010				
	Barium (Ba)-Dissolved (mg/L)	<0.000050				
	Beryllium (Be)-Dissolved (mg/L)	<0.00010				
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050				
	Boron (B)-Dissolved (mg/L)	<0.010				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010				
	Calcium (Ca)-Dissolved (mg/L)	<0.050				
	Chromium (Cr)-Dissolved (mg/L)	<0.00010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00010				
	Copper (Cu)-Dissolved (mg/L)	<0.00020				
	Iron (Fe)-Dissolved (mg/L)	<0.010				
	Lead (Pb)-Dissolved (mg/L)	<0.000050				
	Lithium (Li)-Dissolved (mg/L)	<0.00050				
	Magnesium (Mg)-Dissolved (mg/L)	<0.10				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478694-1	L1478694-2	L1478694-3	L1478694-4	L1478694-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	27-JUN-14	27-JUN-14	27-JUN-14	27-JUN-14	27-JUN-14
	Sampled Time	08:18	08:18	14:42	10:52	07:10
	Client ID	CH-P-13-05/50	DUP-2	MP09-08	MP09-02	GLL07-03
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	30.4	30.5	0.852	0.0130	10.4
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00076	0.00075	0.000477	0.000126	0.00043
	Nickel (Ni)-Dissolved (mg/L)	0.0136	0.0135	<0.00050	<0.00050	0.0499
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	5.18	5.17	1.16	0.86	2.45
	Selenium (Se)-Dissolved (mg/L)	<0.00050 DLA	<0.00050 DLA	<0.00010	<0.00010	<0.00050 DLA
	Silicon (Si)-Dissolved (mg/L)	6.60	6.69	7.00	5.48	3.32
	Silver (Ag)-Dissolved (mg/L)	<0.000050 DLA	<0.000050 DLA	<0.000010	<0.000010	<0.000050 DLA
	Sodium (Na)-Dissolved (mg/L)	11.0	10.9	6.16	4.55	11.0
	Strontium (Sr)-Dissolved (mg/L)	0.647	0.668	1.29	0.652	0.334
	Sulfur (S)-Dissolved (mg/L)	589	580	60.9	53.2	313
	Thallium (Tl)-Dissolved (mg/L)	0.000458	0.000450	<0.000010	<0.000010	0.000391
	Tin (Sn)-Dissolved (mg/L)	<0.00050 DLA	<0.00050 DLA	<0.00010	<0.00010	<0.00050 DLA
	Titanium (Ti)-Dissolved (mg/L)	<0.050 DLA	<0.050 DLA	<0.010	<0.010	<0.050 DLA
	Uranium (U)-Dissolved (mg/L)	0.000931	0.000917	0.00316	0.00134	0.000117
	Vanadium (V)-Dissolved (mg/L)	<0.0050 DLA	<0.0050 DLA	<0.0010	<0.0010	<0.0050 DLA
	Zinc (Zn)-Dissolved (mg/L)	28.2	29.1	0.0012	0.0033	32.0

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-6 Water 26-JUN-14 15:34 MW09-19	L1478694-7 Water 26-JUN-14 15:34 FB-1	L1478694-8 Water 26-JUN-14 13:40 MW09-16	L1478694-9 Water 26-JUN-14 13:40 DUP-1	L1478694-10 Water 26-JUN-14 16:57 MW09-18
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	4.54	0.000093 RRV	0.0321	0.0328	0.375
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00012	0.000058 RRV	0.000089	0.000105	<0.00010 DLA
	Nickel (Ni)-Dissolved (mg/L)	<0.0010 DLA	<0.00050	0.00328	0.00336	<0.0010 DLA
	Phosphorus (P)-Dissolved (mg/L)	0.234	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	7.38	<0.10	5.95	5.83	7.29
	Selenium (Se)-Dissolved (mg/L)	0.00034	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Silicon (Si)-Dissolved (mg/L)	9.30	<0.050	4.78	4.78	4.85
	Silver (Ag)-Dissolved (mg/L)	<0.000020 DLA	<0.000010	<0.000010	0.000017	<0.000020 DLA
	Sodium (Na)-Dissolved (mg/L)	14.7	<0.050	7.08	7.07	10.7
	Strontium (Sr)-Dissolved (mg/L)	1.16	<0.00020	0.586	0.637	1.08
	Sulfur (S)-Dissolved (mg/L)	353	<0.50	258	261	439
	Thallium (Tl)-Dissolved (mg/L)	<0.000020 DLA	<0.000010	0.000250	0.000294	0.000280
	Tin (Sn)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	<0.00010	<0.00010	<0.00020 DLA
	Titanium (Ti)-Dissolved (mg/L)	<0.020	<0.010	<0.010	<0.010	<0.020 DLA
	Uranium (U)-Dissolved (mg/L)	0.000560	<0.000010	0.00304	0.00353	0.00781
	Vanadium (V)-Dissolved (mg/L)	<0.0020 DLA	<0.0010	<0.0010	<0.0010	<0.0020 DLA
	Zinc (Zn)-Dissolved (mg/L)	<0.0020 DLA	<0.0010	3.84	3.78	0.0030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478694-11 Water 27-JUN-14 15:09 MW09-04	L1478694-12 Water 27-JUN-14 13:23 MW09-02	L1478694-13 Water 27-JUN-14 13:23 DUP-3	L1478694-14 Water 27-JUN-14 16:08 MW09-03	L1478694-15 Water 27-JUN-14 16:50 MW09-22
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	4.25	30.7	31.0	50.2	17.9
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00758	0.00564	0.00569	0.00371	0.00012
	Nickel (Ni)-Dissolved (mg/L)	<0.0010 DLA	0.0035	0.0036	<0.0025 DLA	0.0031
	Phosphorus (P)-Dissolved (mg/L)	0.072	<0.050	<0.050	0.060	<0.050
	Potassium (K)-Dissolved (mg/L)	39.5	67.0	66.0	20.6	5.92
	Selenium (Se)-Dissolved (mg/L)	<0.00020 DLA	<0.00050 DLA	<0.00050 DLA	<0.00050 DLA	0.00039
	Silicon (Si)-Dissolved (mg/L)	11.8	7.00	6.95	15.4	4.68
	Silver (Ag)-Dissolved (mg/L)	<0.000020 DLA	<0.000050 DLA	<0.000050 DLA	<0.000050 DLA	0.000045
	Sodium (Na)-Dissolved (mg/L)	43.5	64.1	63.6	26.2	82.0
	Strontium (Sr)-Dissolved (mg/L)	1.45	0.915	0.935	1.59	1.31
	Sulfur (S)-Dissolved (mg/L)	570	589	583	506	634
	Thallium (Tl)-Dissolved (mg/L)	0.000082	0.000254	0.000260	<0.000050 DLA	<0.000020 DLA
	Tin (Sn)-Dissolved (mg/L)	<0.00020 DLA	<0.00050 DLA	<0.00050 DLA	<0.00050 DLA	<0.00020 DLA
	Titanium (Ti)-Dissolved (mg/L)	<0.020 DLA	<0.050 DLA	<0.050 DLA	<0.050 DLA	<0.020 DLA
	Uranium (U)-Dissolved (mg/L)	0.000227	0.000678	0.000717	0.00143	0.000229
	Vanadium (V)-Dissolved (mg/L)	<0.0020 DLA	<0.0050 DLA	<0.0050 DLA	<0.0050 DLA	<0.0020 DLA
	Zinc (Zn)-Dissolved (mg/L)	0.953	0.312	0.309	0.0065	0.0047

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478694-16	L1478694-17			
	Description	Water	Water			
	Sampled Date	27-JUN-14	28-JUN-14			
	Sampled Time	16:50				
	Client ID	FB-2	TRAVEL BLANK			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	<0.000050				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050				
	Nickel (Ni)-Dissolved (mg/L)	<0.00050				
	Phosphorus (P)-Dissolved (mg/L)	<0.050				
	Potassium (K)-Dissolved (mg/L)	<0.10				
	Selenium (Se)-Dissolved (mg/L)	<0.00010				
	Silicon (Si)-Dissolved (mg/L)	<0.050				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	<0.050				
	Strontium (Sr)-Dissolved (mg/L)	<0.00020				
	Sulfur (S)-Dissolved (mg/L)	<0.50				
	Thallium (Tl)-Dissolved (mg/L)	<0.000010				
	Tin (Sn)-Dissolved (mg/L)	<0.00010				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.000010				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0010				

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Organic Carbon	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Inorganic Carbon	MS-B	L1478694-1, -10, -11, -14, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Inorganic Carbon	MS-B	L1478694-1, -10, -11, -14, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1478694-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Inorganic Carbon	MS-B	L1478694-12, -13, -15

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.
RRA	Reported Result Is The Average Of 2 Or More Analyses
RRV	Reported Result Verified By Repeat Analysis

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

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-TIC-VA	Water	Total inorganic carbon by CO2 purge	APHA 5310 TOTAL ORGANIC CARBON (TOC)

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

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)".

CN-FREE-CFA-VA	Water	Free Cyanide in water by CFA	ASTM 7237

Reference Information

This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

CN-SCN-VA Water Thiocyanate by Colour APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.

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

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

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

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

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

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

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

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

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

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

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

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

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

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

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

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.

S2-T-COL-VA Water Total Sulphide by Colorimetric APHA 4500-S2 Sulphide

This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methlyene blue colourimetric method.

TKN-F-VA Water TKN in Water by Fluorescence APHA 4500-NORG D.

This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.

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

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

Laboratory Definition Code	Laboratory Location
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, 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

L1478694-COFC

COC Number: 1 -

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	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:	230 - 2237 2nd Avenue Whitehorse, YT	☐ 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
Phone:	867-456-4865	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	nsandys@hemmera.com, rmartinka@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑ EMAIL ☑ MAIL ☐ FAX	
Company:	Hemmera Environchem Inc.	Email 1 or Fax	nsandys@hemmera.com	
Contact:	Natasha Sandys	Email 2	chris@elr.ca	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q45291	Approver ID:	Cost Center:
Job #:	1343-005.03	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: RM, AB, AN, MI

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	Conductivity, pH, Hardness (as CaCO3)	Total Alkalinity (as CaCO3)	Ammonia N (total), Total Kjeldahl N (TKN)	Nitrate, Nitrite	Cl, Fl, Sulfate (SO4)	Sulphide as S	Anion Sum, Cation Sum, Cation/Anion Balan	Cyanide - Weak Acid Diss.	Cyanide, Total	Cyanide, Free	Thiocyanate	Total Inorganic Carbon, Total Organic Carbo	Dissolved Metals, including Mercury (F/P)	Number of Containers
1	CH-P-13-05/50	27-Jun-14	8:18	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
2	DUP-2	27-Jun-14	8:18	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
3	MP09-08	27-Jun-14	14:42	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
4	MP09-02	27-Jun-14	10:52	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
5	GLL07-03	27-Jun-14	7:10	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
6	MW09-19	26-Jun-14	15:34	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
7	FB-1	26-Jun-14	15:34	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
8	MW09-16	26-Jun-14	13:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
9	DUP-1	26-Jun-14	13:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
10	MW09-18	26-Jun-14	16:57	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
11	MW09-04	27-Jun-14	15:09	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
12	MW09-02	27-Jun-14	13:23	Water	R	R	R	R	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	- See attached parameter sheet for required metals

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		
3.8	4.3	3.2, 5.4			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)		
Released by: C. Jastrebski	Date: 28-Jun-14	Time: 07:45	Received by:	Date: 28-JUN-14	Time: 19:15

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

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Canada Toll Free: 1 800 668 9878

L1478694-COFC

COC Number: 1 -

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		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com, rmartinka@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑ EMAIL ☑ MAIL ☐ FAX	
Company:	Hemmera Environchem Inc.	Email 1 or Fax	nsandys@hemmera.com	
Contact:	Natasha Sandys	Email 2	chris@elr.ca	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q45291	Approver ID:	Cost Center:
Job #:	1343-005.03	GL Account:	Routing Code:
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ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: RM, AB, AN, MI

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14	MW09-03	27-Jun-14	16:08	Water	R	R	R	R	R	R	R	R	R	R	R	R	R		9
15	MW09-22	27-Jun-14	16:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	R		9
16	FB-2	27-Jun-14	16:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	R		9
17	Travel Blank			Water	R	R	R	R	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)
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Are samples for human drinking water use? ☐ Yes ☑ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

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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:
C. Testnebski	28/5-/14	07:45						

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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