



ENVIRONMENTAL DYNAMICS INC.
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Date Received: 06-MAY-14
Report Date: 15-MAY-14 11:24 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1451654
Project P.O. #: NOT SUBMITTED
Job Reference: 14-Y-0270
C of C Numbers: 1, 2
Legal Site Desc:

Can Dang
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1451654-1 Grab 06-MAY-14 08:00 FIELD BLANK	L1451654-2 Grab 06-MAY-14 11:33 R10	L1451654-3 Grab 06-MAY-14 TRAVEL BLANK	L1451654-4 Grab 06-MAY-14 11:20 NF1	L1451654-5 Grab 06-MAY-14 09:30 X3A
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	392	81.9	<2.0	82.3	107
	Hardness (as CaCO3) (mg/L)	186	41.2	<0.50	41.4	52.0
	pH (pH)	8.19	7.70	6.14	7.70	7.81
	Total Suspended Solids (mg/L)	<1.0	45.4	<1.0	6.9	9.6
	Total Dissolved Solids (mg/L)	229	64.6	<1.0	62.8	72.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	151 ^{RRV}	36.2	<2.0	36.9	44.8
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	0.0125 ^{RRV}	<0.0050	0.0051
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	3.19	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.186	0.067	<0.020	0.067	0.079
	Nitrate (as N) (mg/L)	0.0483	0.0252	<0.0050	0.0295	0.0581
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0177 ^{RRV}	0.0914	<0.0020	0.0436	0.0464
	Sulfate (SO4) (mg/L)	62.5	5.21	<0.50	4.88	9.19
	Anion Sum (meq/L)	4.42	0.84	<0.10	0.85	1.09
	Cation Sum (meq/L)	4.20	0.93	<0.10	0.94	1.16
	Cation - Anion Balance (%)	-2.5	5.4	0.0	5.3	2.8
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.64	19.3		17.8	13.2
	Total Organic Carbon (mg/L)	0.88	19.5	<0.50	17.5	13.6
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	0.849	<0.0030	0.297	0.253
	Antimony (Sb)-Total (mg/L)	0.00012	0.00012	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00417	0.00275	<0.00010	0.00146	0.00126
	Barium (Ba)-Total (mg/L)	0.0339	0.0518	<0.000050	0.0395	0.0387
	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)	0.015	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000101	<0.000010	0.000048	0.000125
	Calcium (Ca)-Total (mg/L)	35.2	12.2	<0.020	12.3	15.3
	Chromium (Cr)-Total (mg/L)	0.00012	0.00180	<0.00010	0.00061	0.00048
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00071	<0.00010	0.00023	0.00068
	Copper (Cu)-Total (mg/L)	0.0237	0.00406	<0.00050	0.00239	0.00248
	Iron (Fe)-Total (mg/L)	<0.010	2.12	<0.010	0.822	0.862
	Lead (Pb)-Total (mg/L)	<0.000050	0.00642	<0.000050	0.00229	0.00379
	Lithium (Li)-Total (mg/L)	0.00057	0.00264	<0.00050	0.00159	0.00162
	Magnesium (Mg)-Total (mg/L)	23.7	2.56	<0.0050	2.43	3.30
	Manganese (Mn)-Total (mg/L)	0.000101	0.121	<0.000050	0.0435	0.0640

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1451654-6 Grab 06-MAY-14 09:18 X10	L1451654-7 Grab 06-MAY-14 08:45 X14-R	L1451654-8 Grab 06-MAY-14 09:50 X2	L1451654-9 Grab 06-MAY-14 08:40 X14	L1451654-10 Grab 06-MAY-14 10:35 NF2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	114	178	96.6	178	101
	Hardness (as CaCO3) (mg/L)	53.8	82.8	46.2	76.1	44.7
	pH (pH)	7.87	7.87	7.73	7.83	7.72
	Total Suspended Solids (mg/L)	7.4	12.0	1.7	15.4	6.0
	Total Dissolved Solids (mg/L)	73.9	117	67.7	117	68.4
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	46.5	58.6	39.5	61.0	39.4
	Ammonia, Total (as N) (mg/L)	0.0053	0.0132	<0.0050	0.0101	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	0.58	<0.50
	Fluoride (F) (mg/L)	0.081	0.083	0.076	0.083	0.079
	Nitrate (as N) (mg/L)	0.0609	0.0624	0.0652	0.0637	0.0770
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0340	0.0352	0.0462	0.0305	0.0400
	Sulfate (SO4) (mg/L)	9.89	34.1	8.84	34.0	11.1
	Anion Sum (meq/L)	1.14	1.89	0.98	1.95	1.03
	Cation Sum (meq/L)	1.19	1.81	1.04	1.68	1.03
	Cation - Anion Balance (%)	2.1	-2.1	3.0	-7.5	0.0
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	12.9	12.7	14.8	12.9	14.6
	Total Organic Carbon (mg/L)	13.3	13.0	14.9	13.6	13.9
Total Metals	Aluminum (Al)-Total (mg/L)	0.240	0.363	0.390	0.334	0.270
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	0.00010	0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00117	0.00144	0.00179	0.00134	0.00139
	Barium (Ba)-Total (mg/L)	0.0369	0.0423	0.0376	0.0474	0.0350
	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)	0.000139	0.000154	0.000182	0.000144	0.000274
	Calcium (Ca)-Total (mg/L)	16.2	21.4	13.5	23.9	12.7
	Chromium (Cr)-Total (mg/L)	0.00056	0.00082	0.00081	0.00079	0.00050
	Cobalt (Co)-Total (mg/L)	0.00068	0.00124	0.00118	0.00117	0.00156
	Copper (Cu)-Total (mg/L)	0.00257	0.00287	0.00285	0.00267	0.00243
	Iron (Fe)-Total (mg/L)	0.890	1.31	1.29	1.18	0.774
	Lead (Pb)-Total (mg/L)	0.00312	0.00372	0.00583	0.00428	0.00235
	Lithium (Li)-Total (mg/L)	0.00160	0.00191	0.00193	0.00198	0.00178
	Magnesium (Mg)-Total (mg/L)	3.62	5.47	3.18	5.25	3.44
	Manganese (Mn)-Total (mg/L)	0.0680	0.576	0.0910	0.540	0.0986

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1451654-11 Grab 06-MAY-14 10:10 NF2-A	L1451654-12 Grab 06-MAY-14 10:20 NF2-B		
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	95.4	95.4		
	Hardness (as CaCO3) (mg/L)	46.5	42.4		
	pH (pH)	7.76	7.76		
	Total Suspended Solids (mg/L)	4.8	7.4		
	Total Dissolved Solids (mg/L)	67.2	65.5		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	41.4	41.0		
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050		
	Bromide (Br) (mg/L)	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.076	0.075		
	Nitrate (as N) (mg/L)	0.0759	0.0765		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010		
	Phosphorus (P)-Total (mg/L)	0.0380	0.0421		
	Sulfate (SO4) (mg/L)	7.05	7.19		
	Anion Sum (meq/L)	0.98	0.98		
	Cation Sum (meq/L)	1.05	0.97		
	Cation - Anion Balance (%)	3.3	-0.7		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	14.6	14.5		
	Total Organic Carbon (mg/L)	14.8	14.9		
Total Metals	Aluminum (Al)-Total (mg/L)	0.238	0.317		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	0.00133	0.00141		
	Barium (Ba)-Total (mg/L)	0.0338	0.0353		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	<0.010	<0.010		
	Cadmium (Cd)-Total (mg/L)	0.000076	0.000095		
	Calcium (Ca)-Total (mg/L)	14.0	13.1		
	Chromium (Cr)-Total (mg/L)	0.00047	0.00062		
	Cobalt (Co)-Total (mg/L)	0.00024	0.00038		
	Copper (Cu)-Total (mg/L)	0.00390	0.00260		
	Iron (Fe)-Total (mg/L)	0.671	0.860		
	Lead (Pb)-Total (mg/L)	0.00229	0.00320		
	Lithium (Li)-Total (mg/L)	0.00249	0.00184		
	Magnesium (Mg)-Total (mg/L)	2.95	2.89		
	Manganese (Mn)-Total (mg/L)	0.0254	0.0385		

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1451654-1 Grab 06-MAY-14 08:00 FIELD BLANK	L1451654-2 Grab 06-MAY-14 11:33 R10	L1451654-3 Grab 06-MAY-14 TRAVEL BLANK	L1451654-4 Grab 06-MAY-14 11:20 NF1	L1451654-5 Grab 06-MAY-14 09:30 X3A
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.00470	0.000387	<0.000050	0.000713	0.000344
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00276	<0.00050	0.00139	0.00197
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	2.14	1.74	<0.050	1.74	1.75
	Selenium (Se)-Total (mg/L)	0.00024	0.00019	<0.00010	0.00015	0.00017
	Silicon (Si)-Total (mg/L)	6.28	3.53	<0.050	3.03	3.11
	Silver (Ag)-Total (mg/L)	0.00954	0.000066	<0.000010	0.000022	0.000019
	Sodium (Na)-Total (mg/L)	9.81	0.882	<0.050	0.882	1.11
	Strontium (Sr)-Total (mg/L)	0.295	0.0561	<0.00020	0.0557	0.0765
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000022	<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	0.032	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00319	0.000513	<0.000010	0.000392	0.000566
	Vanadium (V)-Total (mg/L)	0.0015	0.0024	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0065	0.0275	<0.0030	0.0139	0.115
	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
	Aluminum (Al)-Dissolved (mg/L)	0.0016	0.0884		0.0748	0.0502
	Antimony (Sb)-Dissolved (mg/L)	0.00012	<0.00010		<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00409	0.00075		0.00083	0.00066
	Barium (Ba)-Dissolved (mg/L)	0.0338	0.0340		0.0354	0.0308
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010		<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050		<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.015	<0.010		<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000054		0.000034	0.000106
	Calcium (Ca)-Dissolved (mg/L)	35.6	12.4		12.3	15.4
	Chromium (Cr)-Dissolved (mg/L)	0.00011	<0.00010		0.00013	0.00011
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00014		0.00010	0.00046
	Copper (Cu)-Dissolved (mg/L)	0.0237	0.00217		0.00182	0.00190
	Iron (Fe)-Dissolved (mg/L)	<0.010	0.269		0.282	0.259
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000736		0.000464	0.000820
	Lithium (Li)-Dissolved (mg/L)	<0.00050	0.00148		0.00135	0.00157
	Magnesium (Mg)-Dissolved (mg/L)	23.7	2.46		2.57	3.30
	Manganese (Mn)-Dissolved (mg/L)	<0.000050	0.0253		0.0272	0.0456
	Molybdenum (Mo)-Dissolved (mg/L)	0.00483	0.000286		0.000304	0.000316
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00100		0.00090	0.00157
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30		<0.30	<0.30

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1451654-6 Grab 06-MAY-14 09:18 X10	L1451654-7 Grab 06-MAY-14 08:45 X14-R	L1451654-8 Grab 06-MAY-14 09:50 X2	L1451654-9 Grab 06-MAY-14 08:40 X14	L1451654-10 Grab 06-MAY-14 10:35 NF2
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000369	0.000335	0.000366	0.000384	0.000363
	Nickel (Ni)-Total (mg/L)	0.00222	0.00330	0.00269	0.00308	0.00328
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.76	1.86	1.79	1.79	1.78
	Selenium (Se)-Total (mg/L)	0.00018	0.00019	0.00019	0.00018	0.00019
	Silicon (Si)-Total (mg/L)	3.00	3.34	3.16	3.30	3.06
	Silver (Ag)-Total (mg/L)	0.000015	0.000015	0.000027	0.000017	0.000034
	Sodium (Na)-Total (mg/L)	1.14	1.60	1.14	1.55	1.21
	Strontium (Sr)-Total (mg/L)	0.0771	0.0889	0.0654	0.0996	0.0600
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000010	0.000012	0.000010	0.000014
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	0.010	0.013	0.010	0.015
	Uranium (U)-Total (mg/L)	0.000590	0.000635	0.000460	0.000690	0.000430
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0013	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.124	0.127	0.162	0.120	0.322
	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)	0.0454	0.0428	0.0635	0.0435	0.0632
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00065	0.00060	0.00078	0.00063	0.00074
	Barium (Ba)-Dissolved (mg/L)	0.0314	0.0324	0.0298	0.0325	0.0307
	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)	0.000101	0.000105	0.000129	0.000096	0.000264
	Calcium (Ca)-Dissolved (mg/L)	15.6	24.2	13.5	21.6	12.2
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00041	0.00076	0.00063	0.00075	0.00152
	Copper (Cu)-Dissolved (mg/L)	0.00200	0.00192	0.00196	0.00190	0.00194
	Iron (Fe)-Dissolved (mg/L)	0.254	0.295	0.272	0.292	0.294
	Lead (Pb)-Dissolved (mg/L)	0.000693	0.000736	0.000939	0.000645	0.000846
	Lithium (Li)-Dissolved (mg/L)	0.00150	0.00179	0.00166	0.00161	0.00171
	Magnesium (Mg)-Dissolved (mg/L)	3.58	5.42	3.06	5.38	3.45
	Manganese (Mn)-Dissolved (mg/L)	0.0429	0.516	0.0486	0.504	0.0935
	Molybdenum (Mo)-Dissolved (mg/L)	0.000312	0.000316	0.000320	0.000287	0.000292
	Nickel (Ni)-Dissolved (mg/L)	0.00162	0.00225	0.00180	0.00229	0.00300
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1451654-11	L1451654-12			
Description	Grab	Grab			
Sampled Date	06-MAY-14	06-MAY-14			
Sampled Time	10:10	10:20			
Client ID	NF2-A	NF2-B			
Grouping	Analyte				
WATER					
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000378	0.000361		
	Nickel (Ni)-Total (mg/L)	0.00147	0.00187		
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30		
	Potassium (K)-Total (mg/L)	1.84	1.79		
	Selenium (Se)-Total (mg/L)	0.00017	0.00018		
	Silicon (Si)-Total (mg/L)	2.99	3.14		
	Silver (Ag)-Total (mg/L)	0.000018	0.000016		
	Sodium (Na)-Total (mg/L)	1.21	1.12		
	Strontium (Sr)-Total (mg/L)	0.0624	0.0628		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.000467	0.000429		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	0.0355	0.0512		
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080		
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0618	0.0619		
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010		
	Arsenic (As)-Dissolved (mg/L)	0.00080	0.00083		
	Barium (Ba)-Dissolved (mg/L)	0.0305	0.0304		
	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)	0.000068	0.000069		
	Calcium (Ca)-Dissolved (mg/L)	13.8	12.2		
	Chromium (Cr)-Dissolved (mg/L)	0.00013	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	0.00014	0.00017		
	Copper (Cu)-Dissolved (mg/L)	0.00206	0.00200		
	Iron (Fe)-Dissolved (mg/L)	0.261	0.258		
	Lead (Pb)-Dissolved (mg/L)	0.000937	0.000925		
	Lithium (Li)-Dissolved (mg/L)	0.00224	0.00162		
	Magnesium (Mg)-Dissolved (mg/L)	2.94	2.88		
	Manganese (Mn)-Dissolved (mg/L)	0.0176	0.0188		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000339	0.000298		
	Nickel (Ni)-Dissolved (mg/L)	0.00115	0.00117		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1451654-1 Grab 06-MAY-14 08:00 FIELD BLANK	L1451654-2 Grab 06-MAY-14 11:33 R10	L1451654-3 Grab 06-MAY-14 TRAVEL BLANK	L1451654-4 Grab 06-MAY-14 11:20 NF1	L1451654-5 Grab 06-MAY-14 09:30 X3A
Grouping	Analyte					
WATER						
Dissolved Metals	Potassium (K)-Dissolved (mg/L)	2.12	1.73		1.81	1.72
	Selenium (Se)-Dissolved (mg/L)	0.00026	0.00015		0.00014	0.00015
	Silicon (Si)-Dissolved (mg/L)	6.32	2.63		2.63	2.74
	Silver (Ag)-Dissolved (mg/L)	0.0100	<0.000010		<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	9.84	0.917		0.931	1.12
	Strontium (Sr)-Dissolved (mg/L)	0.301	0.0544		0.0541	0.0735
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010		<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010		<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00333	0.000376		0.000359	0.000510
	Vanadium (V)-Dissolved (mg/L)	0.0016	<0.0010		<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0056	0.0227		0.0076	0.109
	Zirconium (Zr)-Dissolved (mg/L)	<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 Description Sampled Date Sampled Time Client ID	L1451654-6 Grab 06-MAY-14 09:18 X10	L1451654-7 Grab 06-MAY-14 08:45 X14-R	L1451654-8 Grab 06-MAY-14 09:50 X2	L1451654-9 Grab 06-MAY-14 08:40 X14	L1451654-10 Grab 06-MAY-14 10:35 NF2
Grouping	Analyte					
WATER						
Dissolved Metals	Potassium (K)-Dissolved (mg/L)	1.73	1.82	1.70	1.82	1.74
	Selenium (Se)-Dissolved (mg/L)	0.00016	0.00016	0.00016	0.00017	0.00017
	Silicon (Si)-Dissolved (mg/L)	2.75	2.88	2.76	2.89	2.73
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.15	1.61	1.12	1.61	1.21
	Strontium (Sr)-Dissolved (mg/L)	0.0736	0.0992	0.0618	0.0871	0.0572
	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)	0.000525	0.000673	0.000415	0.000576	0.000379
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.111	0.108	0.143	0.108	0.357
	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	L1451654-11	L1451654-12		
Description	Grab	Grab			
Sampled Date	06-MAY-14	06-MAY-14			
Sampled Time	10:10	10:20			
Client ID	NF2-A	NF2-B			
Grouping	Analyte				
WATER					
Dissolved Metals	Potassium (K)-Dissolved (mg/L)	1.82	1.76		
	Selenium (Se)-Dissolved (mg/L)	0.00016	0.00017		
	Silicon (Si)-Dissolved (mg/L)	2.76	2.78		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	1.24	1.14		
	Strontium (Sr)-Dissolved (mg/L)	0.0608	0.0549		
	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)	0.000430	0.000394		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.0325	0.0437		
	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	Beryllium (Be)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Phosphorus (P)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Duplicate	Nitrate (as N)	DLM	L1451654-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus (P)-Total	MS-B	L1451654-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus (P)-Total	MS-B	L1451654-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1451654-1, -10, -11, -12, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1451654-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1451654-1, -11, -12, -3, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1451654-10
Matrix Spike	Total Organic Carbon	MS-B	L1451654-2, -4
Matrix Spike	Dissolved Organic Carbon	MS-B	L1451654-2, -4

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-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-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
ANIONS-NO2-IC-VA	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.	
ANIONS-NO3-IC-VA	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.	
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

Reference Information

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

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-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.

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 Phosphorous

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

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.

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-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

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

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

