



HEMMERA ENVIROCHEM INC.  
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Date Received: 23-SEP-14  
Report Date: 07-OCT-14 10:49 (MT)  
Version: FINAL

Client Phone: 867-456-4865

## Certificate of Analysis

**Lab Work Order #:** L1522214  
**Project P.O. #:** NOT SUBMITTED  
**Job Reference:** HEMMERA 1343-005-04. ELR 14-183  
**C of C Numbers:** 10-152910, 10-152911  
**Legal Site Desc:**

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Brent Mack  
Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1522214-1 SW 21-SEP-14 18:50 E7	L1522214-2 SW 22-SEP-14 15:40 E7	L1522214-3 SW 21-SEP-14 18:00 E8	L1522214-4 SW 22-SEP-14 15:20 E8	L1522214-5 SW 21-SEP-14 15:30 GWCC-1
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Hardness (as CaCO3) (mg/L)	486		126		1660
	Total Suspended Solids (mg/L)		<3.0		<3.0	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/L)	0.0063		0.0067		0.0077
	Nitrate (as N) (mg/L)		0.103		0.0954	
	Nitrite (as N) (mg/L)		<0.0010		<0.0010	
	Total Kjeldahl Nitrogen (mg/L)	0.399		0.339		0.157
	Phosphorus (P)-Total (mg/L)	0.0040		0.0027		<0.0020
	Sulfate (SO4) (mg/L)		271		50.1	
<b>Organic / Inorganic Carbon</b>	Dissolved Organic Carbon (mg/L)	13.9		11.2		5.43
	Total Organic Carbon (mg/L)					
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0325		0.134		<0.0030
	Antimony (Sb)-Total (mg/L)	0.00038		0.00012		0.00136
	Arsenic (As)-Total (mg/L)	0.00093		0.00052		0.00217
	Barium (Ba)-Total (mg/L)	0.0527		0.0418		0.0190
	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)	0.053		<0.010		0.288
	Cadmium (Cd)-Total (mg/L)	0.000057		0.000023		0.000203
	Calcium (Ca)-Total (mg/L)	82.0		32.3		205
	Chromium (Cr)-Total (mg/L)	0.00079		0.00051		0.00247
	Cobalt (Co)-Total (mg/L)	0.00077		0.00044		<0.00010
	Copper (Cu)-Total (mg/L)	0.00196		0.00246		0.00093
	Iron (Fe)-Total (mg/L)	0.308		0.344		<0.010
	Lead (Pb)-Total (mg/L)	0.000054		<0.000050		<0.000050
	Lithium (Li)-Total (mg/L)	0.0123		0.00397		0.0714
	Magnesium (Mg)-Total (mg/L)	59.9		10.9		279
	Manganese (Mn)-Total (mg/L)	0.261		0.0275		0.000298
	Mercury (Hg)-Total (mg/L)	<0.000010		<0.000010		<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00152		0.000498		0.00253
	Nickel (Ni)-Total (mg/L)	0.0166		0.00286		0.0757
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050		<0.050
	Potassium (K)-Total (mg/L)	0.99		1.01		3.14
	Selenium (Se)-Total (mg/L)	0.00097		0.00022		0.00412
	Silicon (Si)-Total (mg/L)	4.54		5.12		6.33
Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		<0.000010	
Sodium (Na)-Total (mg/L)	4.54		4.16		17.4	

\* 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	L1522214-6 SW 22-SEP-14 14:30 GWCC-1	L1522214-7 SW 21-SEP-14 15:00 GWCC-2	L1522214-8 SW 22-SEP-14 14:35 GWCC-2	L1522214-9 SW 21-SEP-14 13:35 GWCC-3	L1522214-10 SW 22-SEP-14 14:40 GWCC-3
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Hardness (as CaCO3) (mg/L)		1230		637	
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/L)		<0.0050		<0.0050	
	Nitrate (as N) (mg/L)	0.44		0.396 <sup>DLA</sup>		0.176 <sup>DLA</sup>
	Nitrite (as N) (mg/L)	<0.020 <sup>DLA</sup>		<0.010 <sup>DLA</sup>		<0.010 <sup>DLA</sup>
	Total Kjeldahl Nitrogen (mg/L)		0.222		0.259	
	Phosphorus (P)-Total (mg/L)		<0.0020		<0.0020	
	Sulfate (SO4) (mg/L)	1340		929		412
<b>Organic / Inorganic Carbon</b>	Dissolved Organic Carbon (mg/L)		7.16		9.45	
	Total Organic Carbon (mg/L)					
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)		<0.0030		<0.0030	
	Antimony (Sb)-Total (mg/L)		0.00123		0.00081	
	Arsenic (As)-Total (mg/L)		0.00140		0.00082	
	Barium (Ba)-Total (mg/L)		0.0176		0.0264	
	Beryllium (Be)-Total (mg/L)		<0.00010		<0.00010	
	Bismuth (Bi)-Total (mg/L)		<0.00050		<0.00050	
	Boron (B)-Total (mg/L)		0.144		0.065	
	Cadmium (Cd)-Total (mg/L)		0.000178		0.000091	
	Calcium (Ca)-Total (mg/L)		172		110	
	Chromium (Cr)-Total (mg/L)		0.00173		0.00058	
	Cobalt (Co)-Total (mg/L)		<0.00010		<0.00010	
	Copper (Cu)-Total (mg/L)		0.00112		0.00111	
	Iron (Fe)-Total (mg/L)		<0.010		<0.010	
	Lead (Pb)-Total (mg/L)		0.000090		<0.000050	
	Lithium (Li)-Total (mg/L)		0.0161		0.00631	
	Magnesium (Mg)-Total (mg/L)		193		86.5	
	Manganese (Mn)-Total (mg/L)		0.000207		0.000186	
	Mercury (Hg)-Total (mg/L)		<0.000010		<0.000010	
	Molybdenum (Mo)-Total (mg/L)		0.00288		0.00254	
	Nickel (Ni)-Total (mg/L)		0.0428		0.0297	
	Phosphorus (P)-Total (mg/L)		<0.050		<0.050	
	Potassium (K)-Total (mg/L)		1.93		1.16	
	Selenium (Se)-Total (mg/L)		0.00338		0.00143	
	Silicon (Si)-Total (mg/L)		5.04		4.65	
Silver (Ag)-Total (mg/L)		<0.000010		<0.000010		
Sodium (Na)-Total (mg/L)		6.56		3.85		

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1522214-11 SW 21-SEP-14 14:25 GWCC-4	L1522214-12 SW 22-SEP-14 14:30 GWCC-4	L1522214-13 SW 22-SEP-14 09:25 R3	L1522214-14 SW 21-SEP-14 19:55 R6	L1522214-15 SW 22-SEP-14 15:45 R6
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Hardness (as CaCO3) (mg/L)	431		499	130	
	Total Suspended Solids (mg/L)		<3.0	12.7		<3.0
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/L)	<0.0050		0.0244	0.0065	
	Nitrate (as N) (mg/L)		0.0729	0.0633		0.0859
	Nitrite (as N) (mg/L)		<0.0010	0.0015		<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.288		0.441	0.335	
	Phosphorus (P)-Total (mg/L)	<0.0020		0.0165	0.0033	
	Sulfate (SO4) (mg/L)		231	304		50.2
<b>Organic / Inorganic Carbon</b>	Dissolved Organic Carbon (mg/L)	10.9		12.7	11.1	
	Total Organic Carbon (mg/L)					
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0032		0.307	0.118	
	Antimony (Sb)-Total (mg/L)	0.00080		0.00018	0.00011	
	Arsenic (As)-Total (mg/L)	0.00118		0.00086	0.00062	
	Barium (Ba)-Total (mg/L)	0.0297		0.0560	0.0400	
	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)	0.040		<0.010	<0.010	
	Cadmium (Cd)-Total (mg/L)	0.000050		0.000030	0.000021	
	Calcium (Ca)-Total (mg/L)	77.0		91.3	31.6	
	Chromium (Cr)-Total (mg/L)	0.00047		0.00120	0.00047	
	Cobalt (Co)-Total (mg/L)	<0.00010		0.00065	0.00047	
	Copper (Cu)-Total (mg/L)	0.00109		0.00226	0.00246	
	Iron (Fe)-Total (mg/L)	<0.010		1.05	0.440	
	Lead (Pb)-Total (mg/L)	<0.000050		0.000270	<0.000050	
	Lithium (Li)-Total (mg/L)	0.00540		0.00419	0.00397	
	Magnesium (Mg)-Total (mg/L)	50.4		57.9	11.3	
	Manganese (Mn)-Total (mg/L)	0.000537		0.177	0.0441	
	Mercury (Hg)-Total (mg/L)	<0.000010		<0.000010	<0.000010	
	Molybdenum (Mo)-Total (mg/L)	0.00240		0.00127	0.000476	
	Nickel (Ni)-Total (mg/L)	0.0289		0.00423	0.00271	
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050	<0.050	
	Potassium (K)-Total (mg/L)	0.92		0.90	1.02	
	Selenium (Se)-Total (mg/L)	0.00071		0.00054	0.00021	
	Silicon (Si)-Total (mg/L)	4.98		6.14	4.93	
	Silver (Ag)-Total (mg/L)	<0.000010		<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	2.77		4.11	4.22	

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1522214-16 SW 22-SEP-14 12:15 R7	L1522214-17 SW 21-SEP-14  DUP2	L1522214-18 SW 22-SEP-14  DUP2	L1522214-19 SW 21-SEP-14  FB1	L1522214-20 SW 22-SEP-14  FB1 GC
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Hardness (as CaCO3) (mg/L)	114	638		<0.50	
	Total Suspended Solids (mg/L)	27.3		<3.0		<3.0
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/L)	0.0306	<0.0050		<0.0050	
	Nitrate (as N) (mg/L)	0.145		0.172 <sup>DLA</sup>		<0.0050
	Nitrite (as N) (mg/L)	<0.0010		<0.010 <sup>DLA</sup>		<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.846	0.254		1.59 <sup>RRV</sup>	
	Phosphorus (P)-Total (mg/L)	0.0295	<0.0020		<0.0020	
	Sulfate (SO4) (mg/L)	45.3		413		<0.50
<b>Organic / Inorganic Carbon</b>	Dissolved Organic Carbon (mg/L)	27.2	9.67		51.2	
	Total Organic Carbon (mg/L)					
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.523	<0.0030		<0.0030	
	Antimony (Sb)-Total (mg/L)	0.00022	0.00081		0.00014	
	Arsenic (As)-Total (mg/L)	0.00147	0.00082		<0.00010	
	Barium (Ba)-Total (mg/L)	0.0842	0.0258		0.000226	
	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	0.059		0.022	
	Cadmium (Cd)-Total (mg/L)	0.000033	0.000089		<0.000010	
	Calcium (Ca)-Total (mg/L)	23.9	108		0.139	
	Chromium (Cr)-Total (mg/L)	0.00232	0.00059		<0.00010	
	Cobalt (Co)-Total (mg/L)	0.00102	<0.00010		<0.00010	
	Copper (Cu)-Total (mg/L)	0.00533	0.00109		0.00077	
	Iron (Fe)-Total (mg/L)	2.01	<0.010		<0.010	
	Lead (Pb)-Total (mg/L)	0.000303	<0.000050		0.000086	
	Lithium (Li)-Total (mg/L)	0.00096	0.00688		0.00121	
	Magnesium (Mg)-Total (mg/L)	11.6	84.4		<0.10	
	Manganese (Mn)-Total (mg/L)	0.274	0.000255		<0.000050	
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010		<0.000010	
	Molybdenum (Mo)-Total (mg/L)	0.000532	0.00255		<0.000050	
	Nickel (Ni)-Total (mg/L)	0.00445	0.0288		<0.00050	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050		<0.050	
	Potassium (K)-Total (mg/L)	0.22	1.14		<0.10	
	Selenium (Se)-Total (mg/L)	0.00034	0.00137		<0.00010	
	Silicon (Si)-Total (mg/L)	5.85	4.61		<0.050	
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010		<0.000010		
Sodium (Na)-Total (mg/L)	1.33	3.66		1.43		

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID Description Sampled Date Sampled Time Client ID				
		L1522214-21 SW 23-SEP-14 16:20 TRAVEL BLANK				
<b>WATER</b>						
<b>Physical Tests</b>	Hardness (as CaCO3) (mg/L)		<0.50			
	Total Suspended Solids (mg/L)		<3.0			
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/L)		0.0096			
	Nitrate (as N) (mg/L)		<0.0050			
	Nitrite (as N) (mg/L)		<0.0010			
	Total Kjeldahl Nitrogen (mg/L)		<0.050			
	Phosphorus (P)-Total (mg/L)		<0.0020			
	Sulfate (SO4) (mg/L)		<0.50			
<b>Organic / Inorganic Carbon</b>	Dissolved Organic Carbon (mg/L)					
	Total Organic Carbon (mg/L)		<0.50			
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)		<0.0030			
	Antimony (Sb)-Total (mg/L)		<0.00010			
	Arsenic (As)-Total (mg/L)		<0.00010			
	Barium (Ba)-Total (mg/L)		<0.000050			
	Beryllium (Be)-Total (mg/L)		<0.00010			
	Bismuth (Bi)-Total (mg/L)		<0.00050			
	Boron (B)-Total (mg/L)		<0.010			
	Cadmium (Cd)-Total (mg/L)		<0.000010			
	Calcium (Ca)-Total (mg/L)		<0.050			
	Chromium (Cr)-Total (mg/L)		<0.00010			
	Cobalt (Co)-Total (mg/L)		<0.00010			
	Copper (Cu)-Total (mg/L)		<0.00050			
	Iron (Fe)-Total (mg/L)		<0.010			
	Lead (Pb)-Total (mg/L)		<0.000050			
	Lithium (Li)-Total (mg/L)		<0.00050			
	Magnesium (Mg)-Total (mg/L)		<0.10			
	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			

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1522214-1	L1522214-2	L1522214-3	L1522214-4	L1522214-5
		Description	SW	SW	SW	SW	SW
		Sampled Date	21-SEP-14	22-SEP-14	21-SEP-14	22-SEP-14	21-SEP-14
		Sampled Time	18:50	15:40	18:00	15:20	15:30
		Client ID	E7	E7	E8	E8	GWCC-1
Grouping	Analyte						
<b>WATER</b>							
<b>Total Metals</b>	Strontium (Sr)-Total (mg/L)		0.510		0.170		2.02
	Sulfur (S)-Total (mg/L)		88.8		16.9		442
	Thallium (Tl)-Total (mg/L)		<0.000010		<0.000010		0.000091
	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)		0.00241		0.00106		0.00694
	Vanadium (V)-Total (mg/L)		<0.0010		<0.0010		<0.0010
	Zinc (Zn)-Total (mg/L)		0.0048		0.0045		0.0083
<b>Dissolved Metals</b>	Dissolved Mercury Filtration Location		FIELD		FIELD		FIELD
	Dissolved Metals Filtration Location		FIELD		FIELD		FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0120		0.0711		0.0010
	Antimony (Sb)-Dissolved (mg/L)		0.00039		0.00013		0.00133
	Arsenic (As)-Dissolved (mg/L)		0.00091		0.00045		0.00216
	Barium (Ba)-Dissolved (mg/L)		0.0547		0.0410		0.0191
	Beryllium (Be)-Dissolved (mg/L)		<0.00010		<0.00010		<0.00010
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050		<0.00050		<0.00050
	Boron (B)-Dissolved (mg/L)		0.049		<0.010		0.264
	Cadmium (Cd)-Dissolved (mg/L)		0.000053		0.000019		0.000205
	Calcium (Ca)-Dissolved (mg/L)		88.8		32.5		207
	Chromium (Cr)-Dissolved (mg/L)		0.00057		0.00033		0.00232
	Cobalt (Co)-Dissolved (mg/L)		0.00076		0.00040		<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00194		0.00233		0.00088
	Iron (Fe)-Dissolved (mg/L)		0.246		0.244		<0.010
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050		<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.0130		0.00415		0.0682
	Magnesium (Mg)-Dissolved (mg/L)		64.1		10.8		277
	Manganese (Mn)-Dissolved (mg/L)		0.274		0.0257		0.000212
	Mercury (Hg)-Dissolved (mg/L)		<0.000010		<0.000010		<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.00155		0.000457		0.00248
	Nickel (Ni)-Dissolved (mg/L)		0.0172		0.00276		0.0739
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050		<0.050
	Potassium (K)-Dissolved (mg/L)		1.07		0.98		3.11
	Selenium (Se)-Dissolved (mg/L)		0.00105		0.00023		0.00422
	Silicon (Si)-Dissolved (mg/L)		4.82		4.96		6.33
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)		4.82		4.19		17.4
	Strontium (Sr)-Dissolved (mg/L)		0.525		0.166		2.01

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1522214-6 SW 22-SEP-14 14:30 GWCC-1	L1522214-7 SW 21-SEP-14 15:00 GWCC-2	L1522214-8 SW 22-SEP-14 14:35 GWCC-2	L1522214-9 SW 21-SEP-14 13:35 GWCC-3	L1522214-10 SW 22-SEP-14 14:40 GWCC-3
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Strontium (Sr)-Total (mg/L)		1.01		0.540	
	Sulfur (S)-Total (mg/L)		313		139	
	Thallium (Tl)-Total (mg/L)		0.000072		0.000059	
	Tin (Sn)-Total (mg/L)		<0.00010		<0.00010	
	Titanium (Ti)-Total (mg/L)		<0.010		<0.010	
	Uranium (U)-Total (mg/L)		0.00328		0.00145	
	Vanadium (V)-Total (mg/L)		<0.0010		<0.0010	
	Zinc (Zn)-Total (mg/L)		0.0060		0.0036	
<b>Dissolved Metals</b>	Dissolved Mercury Filtration Location		FIELD		FIELD	
	Dissolved Metals Filtration Location		FIELD		FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0019		0.0017	
	Antimony (Sb)-Dissolved (mg/L)		0.00113		0.00083	
	Arsenic (As)-Dissolved (mg/L)		0.00135		0.00082	
	Barium (Ba)-Dissolved (mg/L)		0.0178		0.0266	
	Beryllium (Be)-Dissolved (mg/L)		<0.00010		<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050		<0.00050	
	Boron (B)-Dissolved (mg/L)		0.110		0.058	
	Cadmium (Cd)-Dissolved (mg/L)		0.000179		0.000089	
	Calcium (Ca)-Dissolved (mg/L)		175		112	
	Chromium (Cr)-Dissolved (mg/L)		0.00164		0.00048	
	Cobalt (Co)-Dissolved (mg/L)		<0.00010		<0.00010	
	Copper (Cu)-Dissolved (mg/L)		0.00121		0.00104	
	Iron (Fe)-Dissolved (mg/L)		<0.010		<0.010	
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050	
	Lithium (Li)-Dissolved (mg/L)		0.0133		0.00665	
	Magnesium (Mg)-Dissolved (mg/L)		194		86.9	
	Manganese (Mn)-Dissolved (mg/L)		0.000246		0.000164	
	Mercury (Hg)-Dissolved (mg/L)		<0.000010		<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)		0.00264		0.00249	
	Nickel (Ni)-Dissolved (mg/L)		0.0446		0.0284	
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	
	Potassium (K)-Dissolved (mg/L)		1.92		1.18	
	Selenium (Se)-Dissolved (mg/L)		0.00363		0.00148	
	Silicon (Si)-Dissolved (mg/L)		5.05		4.66	
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	
	Sodium (Na)-Dissolved (mg/L)		6.76		3.74	
	Strontium (Sr)-Dissolved (mg/L)		0.963		0.535	

\* 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	L1522214-11 SW 21-SEP-14 14:25 GWCC-4	L1522214-12 SW 22-SEP-14 14:30 GWCC-4	L1522214-13 SW 22-SEP-14 09:25 R3	L1522214-14 SW 21-SEP-14 19:55 R6	L1522214-15 SW 22-SEP-14 15:45 R6
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Strontium (Sr)-Total (mg/L)	0.383		0.430	0.167	
	Sulfur (S)-Total (mg/L)	76.3		99.9	17.0	
	Thallium (Tl)-Total (mg/L)	0.000061		<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)	0.000904		0.00612	0.00108	
	Vanadium (V)-Total (mg/L)	<0.0010		0.0014	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0030		0.0048	0.0041	
<b>Dissolved Metals</b>	Dissolved Mercury Filtration Location	FIELD		FIELD	FIELD	
	Dissolved Metals Filtration Location	FIELD		FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.0020		0.0215	0.0678	
	Antimony (Sb)-Dissolved (mg/L)	0.00082		0.00017	0.00011	
	Arsenic (As)-Dissolved (mg/L)	0.00123		0.00055	0.00058	
	Barium (Ba)-Dissolved (mg/L)	0.0310		0.0462	0.0403	
	Beryllium (Be)-Dissolved (mg/L)	<0.00010		<0.00010	<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050		<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)	0.037		<0.010	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)	0.000048		0.000012	0.000022	
	Calcium (Ca)-Dissolved (mg/L)	83.8		97.8	32.9	
	Chromium (Cr)-Dissolved (mg/L)	0.00041		0.00049	0.00032	
	Cobalt (Co)-Dissolved (mg/L)	<0.00010		0.00044	0.00045	
	Copper (Cu)-Dissolved (mg/L)	0.00106		0.00160	0.00223	
	Iron (Fe)-Dissolved (mg/L)	<0.010		0.184	0.363	
	Lead (Pb)-Dissolved (mg/L)	<0.000050		<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	0.00554		0.00434	0.00420	
	Magnesium (Mg)-Dissolved (mg/L)	53.8		61.8	11.5	
	Manganese (Mn)-Dissolved (mg/L)	0.000393		0.172	0.0433	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010		<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.00240		0.00126	0.000456	
	Nickel (Ni)-Dissolved (mg/L)	0.0299		0.00345	0.00265	
	Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050	<0.050	
	Potassium (K)-Dissolved (mg/L)	0.99		0.87	1.03	
	Selenium (Se)-Dissolved (mg/L)	0.00072		0.00052	0.00023	
	Silicon (Si)-Dissolved (mg/L)	5.32		5.98	4.98	
	Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	2.88		4.28	4.22	
	Strontium (Sr)-Dissolved (mg/L)	0.393		0.448	0.168	

\* 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	L1522214-16 SW 22-SEP-14 12:15 R7	L1522214-17 SW 21-SEP-14  DUP2	L1522214-18 SW 22-SEP-14  DUP2	L1522214-19 SW 21-SEP-14  FB1	L1522214-20 SW 22-SEP-14  FB1 GC
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Strontium (Sr)-Total (mg/L)	0.0743	0.533		0.00105	
	Sulfur (S)-Total (mg/L)	14.9	136		<0.50	
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000060		<0.000010	
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010		<0.00010	
	Titanium (Ti)-Total (mg/L)	0.020	<0.010		<0.010	
	Uranium (U)-Total (mg/L)	0.000128	0.00145		<0.000010	
	Vanadium (V)-Total (mg/L)	0.0025	<0.0010		<0.0010	
	Zinc (Zn)-Total (mg/L)	0.0042	0.0036		<0.0030	
<b>Dissolved Metals</b>	Dissolved Mercury Filtration Location	FIELD	FIELD		FIELD	
	Dissolved Metals Filtration Location	FIELD	FIELD		FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.116	0.0016		<0.0010	
	Antimony (Sb)-Dissolved (mg/L)	0.00022	0.00084		0.00010	
	Arsenic (As)-Dissolved (mg/L)	0.00128	0.00085		<0.00010	
	Barium (Ba)-Dissolved (mg/L)	0.0772	0.0262		0.000206	
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010		<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050		<0.00050	
	Boron (B)-Dissolved (mg/L)	<0.010	0.055		0.016	
	Cadmium (Cd)-Dissolved (mg/L)	0.000025	0.000087		<0.000010	
	Calcium (Ca)-Dissolved (mg/L)	25.5	112		0.142	
	Chromium (Cr)-Dissolved (mg/L)	0.00146	0.00047		<0.00010	
	Cobalt (Co)-Dissolved (mg/L)	0.00080	<0.00010		<0.00010	
	Copper (Cu)-Dissolved (mg/L)	0.00455	0.00102		0.00071	
	Iron (Fe)-Dissolved (mg/L)	1.30	<0.010		<0.010	
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		<0.000050	
	Lithium (Li)-Dissolved (mg/L)	0.00072	0.00718		<0.00050	
	Magnesium (Mg)-Dissolved (mg/L)	12.3	87.0		<0.10	
	Manganese (Mn)-Dissolved (mg/L)	0.277	0.000167		<0.000050	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010		<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.000517	0.00254		<0.000050	
	Nickel (Ni)-Dissolved (mg/L)	0.00399	0.0286		<0.00050	
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		<0.050	
	Potassium (K)-Dissolved (mg/L)	0.20	1.16		<0.10	
	Selenium (Se)-Dissolved (mg/L)	0.00036	0.00148		<0.00010	
	Silicon (Si)-Dissolved (mg/L)	5.55	4.72		<0.050	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		<0.000010	
	Sodium (Na)-Dissolved (mg/L)	1.39	3.71		1.47	
	Strontium (Sr)-Dissolved (mg/L)	0.0743	0.539		0.00097	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	<b>Sample ID</b> <b>Description</b> <b>Sampled Date</b> <b>Sampled Time</b> <b>Client ID</b>				
	L1522214-21 SW 23-SEP-14 16:20 TRAVEL BLANK				
Grouping	Analyte				
<b>WATER</b>					
<b>Total Metals</b>	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			
<b>Dissolved Metals</b>	Dissolved Mercury Filtration Location				
	Dissolved Metals Filtration Location				
	Aluminum (Al)-Dissolved (mg/L)				
	Antimony (Sb)-Dissolved (mg/L)				
	Arsenic (As)-Dissolved (mg/L)				
	Barium (Ba)-Dissolved (mg/L)				
	Beryllium (Be)-Dissolved (mg/L)				
	Bismuth (Bi)-Dissolved (mg/L)				
	Boron (B)-Dissolved (mg/L)				
	Cadmium (Cd)-Dissolved (mg/L)				
	Calcium (Ca)-Dissolved (mg/L)				
	Chromium (Cr)-Dissolved (mg/L)				
	Cobalt (Co)-Dissolved (mg/L)				
	Copper (Cu)-Dissolved (mg/L)				
	Iron (Fe)-Dissolved (mg/L)				
	Lead (Pb)-Dissolved (mg/L)				
	Lithium (Li)-Dissolved (mg/L)				
	Magnesium (Mg)-Dissolved (mg/L)				
	Manganese (Mn)-Dissolved (mg/L)				
	Mercury (Hg)-Dissolved (mg/L)				
	Molybdenum (Mo)-Dissolved (mg/L)				
	Nickel (Ni)-Dissolved (mg/L)				
	Phosphorus (P)-Dissolved (mg/L)				
	Potassium (K)-Dissolved (mg/L)				
	Selenium (Se)-Dissolved (mg/L)				
	Silicon (Si)-Dissolved (mg/L)				
	Silver (Ag)-Dissolved (mg/L)				
	Sodium (Na)-Dissolved (mg/L)				
	Strontium (Sr)-Dissolved (mg/L)				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1522214-1	L1522214-2	L1522214-3	L1522214-4	L1522214-5
		Description	SW	SW	SW	SW	SW
		Sampled Date	21-SEP-14	22-SEP-14	21-SEP-14	22-SEP-14	21-SEP-14
		Sampled Time	18:50	15:40	18:00	15:20	15:30
		Client ID	E7	E7	E8	E8	GWCC-1
Grouping	Analyte						
<b>WATER</b>							
<b>Dissolved Metals</b>	Sulfur (S)-Dissolved (mg/L)	94.3			16.7		435
	Thallium (Tl)-Dissolved (mg/L)	<0.000010			<0.000010		0.000092
	Tin (Sn)-Dissolved (mg/L)	<0.00010			<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010			<0.010		<0.010
	Uranium (U)-Dissolved (mg/L)	0.00251			0.00102		0.00684
	Vanadium (V)-Dissolved (mg/L)	<0.0010			<0.0010		<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0024			0.0034		0.0073

\* 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	L1522214-6	L1522214-7	L1522214-8	L1522214-9	L1522214-10
					SW	SW	SW	SW	SW
		22-SEP-14	14:30	GWCC-1	22-SEP-14	21-SEP-14	22-SEP-14	21-SEP-14	22-SEP-14
					14:30	15:00	14:35	13:35	14:40
					GWCC-1	GWCC-2	GWCC-2	GWCC-3	GWCC-3
Grouping	Analyte								
<b>WATER</b>									
<b>Dissolved Metals</b>	Sulfur (S)-Dissolved (mg/L)					314		139	
	Thallium (Tl)-Dissolved (mg/L)					0.000065		0.000058	
	Tin (Sn)-Dissolved (mg/L)					<0.00010		<0.00010	
	Titanium (Ti)-Dissolved (mg/L)					<0.010		<0.010	
	Uranium (U)-Dissolved (mg/L)					0.00311		0.00146	
	Vanadium (V)-Dissolved (mg/L)					<0.0010		<0.0010	
	Zinc (Zn)-Dissolved (mg/L)					0.0053		0.0024	

\* 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	L1522214-11	L1522214-12	L1522214-13	L1522214-14	L1522214-15
					SW	SW	SW	SW	SW
					21-SEP-14	22-SEP-14	22-SEP-14	21-SEP-14	22-SEP-14
					14:25	14:30	09:25	19:55	15:45
					GWCC-4	GWCC-4	R3	R6	R6
Grouping	Analyte								
<b>WATER</b>									
<b>Dissolved Metals</b>	Sulfur (S)-Dissolved (mg/L)				79.2		105	17.3	
	Thallium (Tl)-Dissolved (mg/L)				0.000062		<0.000010	<0.000010	
	Tin (Sn)-Dissolved (mg/L)				<0.00010		<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)				<0.010		<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)				0.000937		0.00621	0.00105	
	Vanadium (V)-Dissolved (mg/L)				<0.0010		<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)				0.0012		0.0013	0.0026	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1522214-16	L1522214-17	L1522214-18	L1522214-19	L1522214-20
		Description	SW	SW	SW	SW	SW
		Sampled Date	22-SEP-14	21-SEP-14	22-SEP-14	21-SEP-14	22-SEP-14
		Sampled Time	12:15				
		Client ID	R7	DUP2	DUP2	FB1	FB1 GC
Grouping	Analyte						
<b>WATER</b>							
<b>Dissolved Metals</b>	Sulfur (S)-Dissolved (mg/L)		15.6	136		<0.50	
	Thallium (Tl)-Dissolved (mg/L)		<0.000010	0.000059		<0.000010	
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010		<0.00010	
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010		<0.010	
	Uranium (U)-Dissolved (mg/L)		0.000099	0.00145		<0.000010	
	Vanadium (V)-Dissolved (mg/L)		0.0011	<0.0010		<0.0010	
	Zinc (Zn)-Dissolved (mg/L)		0.0022	0.0025		<0.0010	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	<b>Sample ID</b> <b>Description</b> <b>Sampled Date</b> <b>Sampled Time</b> <b>Client ID</b>	L1522214-21 SW 23-SEP-14 16:20 TRAVEL BLANK			
<b>Grouping</b>	<b>Analyte</b>				
<b>WATER</b>					
<b>Dissolved Metals</b>	Sulfur (S)-Dissolved (mg/L) Thallium (Tl)-Dissolved (mg/L) Tin (Sn)-Dissolved (mg/L) Titanium (Ti)-Dissolved (mg/L) Uranium (U)-Dissolved (mg/L) Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L)				

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



## Reference Information

### Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comment:
L1522214-19	Water	Note: Results confirmed by repeat analysis	

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Dissolved Organic Carbon	MS-B	L1522214-1, -11, -13, -14, -17, -3, -5, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1522214-1, -11, -13, -14, -16, -17, -19, -3, -5, -7, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1522214-1, -11, -13, -14, -16, -17, -19, -3, -5, -7, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1522214-1, -11, -13, -14, -16, -17, -19, -3, -5, -7, -9
Matrix Spike	Dissolved Organic Carbon	MS-B	L1522214-16
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1522214-1, -11, -13, -14, -16, -17, -19, -3, -5, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1522214-1, -11, -13, -14, -16, -17, -19, -3, -5, -7, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1522214-16, -17, -19
Matrix Spike	Manganese (Mn)-Total	MS-B	L1522214-16, -17, -19
Matrix Spike	Sodium (Na)-Total	MS-B	L1522214-16, -17, -19
Matrix Spike	Strontium (Sr)-Total	MS-B	L1522214-16, -17, -19

### 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.
RRV	Reported Result Verified By Repeat Analysis

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ANIONS-NO2-IC-WR</b>	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.			
<b>ANIONS-NO3-IC-WR</b>	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.			
<b>ANIONS-SO4-IC-WR</b>	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.			
<b>CARBONS-DOC-VA</b>	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.			
<b>CARBONS-TOC-VA</b>	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)".			
<b>HARDNESS-CALC-VA</b>	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.			
<b>HG-DIS-LOW-CVAFS-VA</b>	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).			
<b>HG-TOT-LOW-CVAFS-VA</b>	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).			

## Reference Information

<b>MET-D-CCMS-VA</b>	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).			
<b>MET-DIS-LOW-ICP-VA</b>	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).			
<b>MET-T-CCMS-VA</b>	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).			
<b>MET-TOT-LOW-ICP-VA</b>	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
<b>NH3-F-VA</b>	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.			
<b>P-T-PRES-COL-VA</b>	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.			
<b>S-DIS-ICP-VA</b>	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.			
<b>S-TOT-ICP-VA</b>	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.			
<b>TKN-F-VA</b>	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.			
<b>TSS-MAN-WR</b>	Water	Total Suspended Solids by Gravimetric	APHA 2540 D
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.			

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

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

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

## Reference Information

WR VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

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### Chain of Custody Numbers:

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10-152910 10-152911

### 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.

# Short Holding Time



Rush Processing

Chain of Custody / Analytical Request Form  
 Canada Toll Free: 1 800 668 9878  
 www.alsglobal.com



L1522214-COFC

152910

Page 1 of 2

ALS to confirm TAT

<b>Report To</b>	<b>Report Format / Distribution</b>	
Company: <u>Hemera Environmental Inc</u>	Standard: <input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)
Contact: <u>Natasha Saunders</u>	Select: PDF Excel Digital Fax	<input type="checkbox"/> Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: <u>#203-2237 2<sup>nd</sup> Ave</u>	Email 1: <u>greg@elr.ca, chris@elr.ca</u>	<input type="checkbox"/> Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
<u>Whitcomb VT</u>	Email 2: <u>abraham@hemera.com, nsaunders@hemera.com</u>	<input type="checkbox"/> Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: <u>867 456 4865 (x713)</u> Fax:	<u>Daistie/Lach Data</u>	

<b>Invoice To</b>	<b>Client / Project Information</b>	<b>Analysis Request</b>	
Same as Report? (circle) <input checked="" type="checkbox"/> Yes or No (if No, provide details)	Job #: <u>Hemera 1343-005-04</u>	(Indicate Filtered or Preserved, F/P)	
Copy of Invoice with Report? (circle) <input checked="" type="checkbox"/> Yes or No	LSD: <u>ELR 14-183</u>	<input type="checkbox"/>	<input type="checkbox"/>
Company:	Quote #: <u>Q46959 (attn: Natasha)</u>	<input type="checkbox"/>	<input type="checkbox"/>
Contact: <u>SAME AS REPORT</u>	ALS Contact: <u>B Mack</u>	<input type="checkbox"/>	<input type="checkbox"/>
Address:	Sampler: <u>A Brown</u>	<input type="checkbox"/>	<input type="checkbox"/>
Phone:	<u>A Nicholson</u>	<input type="checkbox"/>	<input type="checkbox"/>
Fax:		<input type="checkbox"/>	<input type="checkbox"/>

<b>Lab Work Order # (lab use only)</b>	<b>ALS Contact:</b> <u>B Mack</u>	<b>Sampler:</b> <u>A Brown</u>
		<u>A Nicholson</u>

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Dis/ Metals	Low Level Total Metals	Nitrate Nitrite Sulphate	Total Phosphorus	Ammonia	DOE TSS	DOE	Total K Nitrogen	Total Hardness	Number of Containers
E7		21-009-14	18:50	SW	✓	✓			✓		✓			6
E7		22-009-14	15:40				✓	✓	✓	✓		✓	✓	1
E8		21-009-14	18:00		✓	✓			✓		✓			6
E8		22-009-14	15:20				✓	✓	✓	✓		✓	✓	1
GWCC-1		21-009-14	15:30		✓	✓			✓		✓			6
GWCC-1		22-009-14	14:30				✓	✓	✓	✓		✓	✓	1
GWCC-2		21-009-14	15:00		✓	✓			✓		✓			6
GWCC-2		22-009-14	14:35				✓	✓	✓	✓		✓	✓	1
GWCC-3		21-009-14	13:35		✓	✓			✓		✓			6
GWCC-3		22-009-14	14:40				✓	✓	✓	✓		✓	✓	1
<del>GWCC-4</del> GWCC-4		21-009-14	14:25		✓	✓			✓		✓			6
<del>GWCC-4</del> GWCC-4		22-009-14	14:30				✓	✓	✓	✓		✓	✓	1

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

CCME Standards.

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.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
<u>Aaron Nicholson</u>	<u>23 Sept 2014</u>		<u>[Signature]</u>	<u>23-SEP-14</u>	<u>9:20</u>	<u>-0.8, 1.00C</u>				Yes / No ? If Yes add SIF

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

GENF 16.01 Front

PAUL

SEP 26

14:30

4°C



L1522214-COFC

<b>Report To</b> Hemmer Environ	<b>Report Format / Distribution</b>	<b>Service requirements</b> (ability - Contact ALS to confirm TAT)
<b>Company:</b>	Standard: <input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)
<b>Contact:</b> Natasha Sardis	Select: PDF Excel Digital Fax	Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
<b>Address:</b> #203-2237 2 <sup>nd</sup> Ave Whitby Ont	Email 1: Email 2: SAME AS COC X of 2	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
<b>Phone:</b> 667 456 4965 (713) Fax:		Same Day or Weekend Emergency - Contact ALS to confirm TAT

<b>Invoice To</b> Same as Report? (circle) <input checked="" type="checkbox"/> Yes or No (If No, provide details)	<b>Client / Project Information</b>	<b>Analysis Request</b> (Indicate Filtered or Preserved, F/P)																		
Copy of Invoice with Report? (circle) <input checked="" type="checkbox"/> Yes or No	Job #: 1343-005.04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Company:</b>	PO / AFE:	Low Level Dis Metals	Low Level Totl Metals	Nitrate, Nitrite Sulphate	Total Phosphorus	Ammonia	TSS	DOC	Total K Nitrogen	Total Hardness										
<b>Contact:</b> SAME AS REPORT	LSD:																			
<b>Address:</b>	Quote #: Q46959 (attn: Natasha)																			
<b>Phone:</b> Fax:	ALS Contact: B Mack																			
	Sampler: A Brown A Nicholson																			
<b>Lab Work Order # (lab use only)</b>																				

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Dis Metals	Low Level Totl Metals	Nitrate, Nitrite Sulphate	Total Phosphorus	Ammonia	TSS	DOC	Total K Nitrogen	Total Hardness	Number of Containers
R3		22-009-14	09:25	SW	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7
R6		21-009-14	19:55		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6
R6		22-009-14	15:45		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
R7		22-009-14	12:15		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7
DUP2		21-009-14			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6
DUP2		22-009-14			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
FB1		21-009-14			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6
FB1 GC		22-009-14			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
Travel Blank		23-009-14	16:20		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6

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

CCME standards . Travel blank not filtered/preserved. Travel Blank as supplied by lab. Lab did not supply DI water for field blank, used sealed jugs of "Turbo Power" DI water

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.

<b>SHIPMENT RELEASE (client use)</b>			<b>SHIPMENT RECEPTION (lab use only)</b>				<b>SHIPMENT VERIFICATION (lab use only)</b>			
Released by: Aaron Nicholson	Date: 23 Sept 2014	Time:	Received by:	Date:	Time:	Temperature: °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF