



HEMMERA ENVIROCHEM INC.
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Date Received: 22-SEP-14
Report Date: 01-OCT-14 17:25 (MT)
Version: FINAL

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1521155
Project P.O. #: NOT SUBMITTED
Job Reference: HEMMERA 1343-005.04/ELR 14-183
C of C Numbers: 10-152908, 10-152909
Legal Site Desc:

Brent Mack
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1521155-1 Surface Water 19-SEP-14 11:02 E1	L1521155-2 Surface Water 19-SEP-14 DUP 1	L1521155-3 Surface Water 20-SEP-14 15:10 E1	L1521155-4 Surface Water 20-SEP-14 DUP 1	L1521155-5 Surface Water 19-SEP-14 13:45 GWCC-5
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	278	279			541
	Total Suspended Solids (mg/L)			<3.0	<3.0	
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0107	0.0110			0.0062
	Nitrate (as N) (mg/L)			0.152	0.151	
	Nitrite (as N) (mg/L)			0.0016	0.0021	
	Total Kjeldahl Nitrogen (mg/L)	0.418	0.490			0.235
	Phosphorus (P)-Total (mg/L)	0.0050	0.0059			0.0026
	Sulfate (SO4) (mg/L)			139	139	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	16.8	17.1			8.31
Total Metals	Aluminum (Al)-Total (mg/L)	0.0420	0.0382			<0.0030
	Antimony (Sb)-Total (mg/L)	0.00034	0.00034			0.00089
	Arsenic (As)-Total (mg/L)	0.00080	0.00077			0.00069
	Barium (Ba)-Total (mg/L)	0.0554	0.0551			0.0551
	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)	0.012	0.012			0.039
	Cadmium (Cd)-Total (mg/L)	0.000036	0.000040			0.000120
	Calcium (Ca)-Total (mg/L)	59.3	59.3			123
	Chromium (Cr)-Total (mg/L)	0.00078	0.00069			0.00080
	Cobalt (Co)-Total (mg/L)	0.00032	0.00031			<0.00010
	Copper (Cu)-Total (mg/L)	0.00324	0.00330			0.00122
	Iron (Fe)-Total (mg/L)	0.235	0.233			0.011
	Lead (Pb)-Total (mg/L)	0.000083	0.000083			<0.000050
	Lithium (Li)-Total (mg/L)	0.00300	0.00312			0.0103
	Magnesium (Mg)-Total (mg/L)	29.7	30.0			57.5
	Manganese (Mn)-Total (mg/L)	0.102	0.101			0.00230
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00138	0.00139			0.00197
	Nickel (Ni)-Total (mg/L)	0.00537	0.00525			0.0170
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			<0.050
	Potassium (K)-Total (mg/L)	0.57	0.56			0.96
	Selenium (Se)-Total (mg/L)	0.00141	0.00140			0.00475
	Silicon (Si)-Total (mg/L)	4.40	4.46			4.82
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			<0.000010
	Sodium (Na)-Total (mg/L)	2.62	2.62			3.98
	Strontium (Sr)-Total (mg/L)	0.290	0.303			0.771

* 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	L1521155-6 Surface Water 20-SEP-14 15:15 GWCC-5	L1521155-7 Surface Water 19-SEP-14 15:00 E2	L1521155-8 Surface Water 20-SEP-14 15:25 E2	L1521155-9 Surface Water 19-SEP-14 16:20 E3	L1521155-10 Surface Water 20-SEP-14 15:25 E3
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)		433		465	
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
Anions and Nutrients	Ammonia, Total (as N) (mg/L)		0.0128		0.0063	
	Nitrate (as N) (mg/L)	<0.025 ^{DLA}		0.138		0.126
	Nitrite (as N) (mg/L)	<0.0050 ^{DLA}		0.0011		0.0013
	Total Kjeldahl Nitrogen (mg/L)		0.428		0.411	
	Phosphorus (P)-Total (mg/L)		0.0043		0.0093	
	Sulfate (SO4) (mg/L)	281		252		261
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		15.0		13.5	
Total Metals	Aluminum (Al)-Total (mg/L)		0.0253		0.0681	
	Antimony (Sb)-Total (mg/L)		0.00046		0.00102	
	Arsenic (As)-Total (mg/L)		0.00120		0.00125	
	Barium (Ba)-Total (mg/L)		0.0517		0.0539	
	Beryllium (Be)-Total (mg/L)		<0.00010		<0.00010	
	Bismuth (Bi)-Total (mg/L)		<0.00050		<0.00050	
	Boron (B)-Total (mg/L)		0.045		0.089	
	Cadmium (Cd)-Total (mg/L)		0.000055		0.000019	
	Calcium (Ca)-Total (mg/L)		79.0		77.2	
	Chromium (Cr)-Total (mg/L)		0.00070		0.00104	
	Cobalt (Co)-Total (mg/L)		0.00070		0.00030	
	Copper (Cu)-Total (mg/L)		0.00267		0.00182	
	Iron (Fe)-Total (mg/L)		0.347		0.341	
	Lead (Pb)-Total (mg/L)		<0.000050		0.000057	
	Lithium (Li)-Total (mg/L)		0.00990		0.00502	
	Magnesium (Mg)-Total (mg/L)		55.4		62.3	
	Manganese (Mn)-Total (mg/L)		0.119		0.0901	
	Mercury (Hg)-Total (mg/L)		<0.000010		<0.000010	
	Molybdenum (Mo)-Total (mg/L)		0.00181		0.00146	
	Nickel (Ni)-Total (mg/L)		0.0162		0.0110	
	Phosphorus (P)-Total (mg/L)		<0.050		<0.050	
	Potassium (K)-Total (mg/L)		0.85		0.88	
	Selenium (Se)-Total (mg/L)		0.00144		0.00082	
	Silicon (Si)-Total (mg/L)		4.70		5.81	
	Silver (Ag)-Total (mg/L)		<0.000010		<0.000010	
	Sodium (Na)-Total (mg/L)		4.06		4.49	
	Strontium (Sr)-Total (mg/L)		0.497		0.410	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1521155-11 Surface Water 19-SEP-14 18:38 E4	L1521155-12 Surface Water 20-SEP-14 15:35 E4	L1521155-13 Surface Water 19-SEP-14 17:35 R4	L1521155-14 Surface Water 20-SEP-14 15:40 R4	L1521155-15 Surface Water 20-SEP-14 10:10 R1
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	473		448		401
	Total Suspended Solids (mg/L)		<3.0		<3.0	6.0
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0054		0.0175		0.0310
	Nitrate (as N) (mg/L)		0.103		0.113	0.162
	Nitrite (as N) (mg/L)		<0.0010		<0.0010	0.0011
	Total Kjeldahl Nitrogen (mg/L)	0.394		0.378		0.368
	Phosphorus (P)-Total (mg/L)	0.0055		0.0036		0.0064
	Sulfate (SO4) (mg/L)		268		235	220
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	14.3		12.9		12.7
Total Metals	Aluminum (Al)-Total (mg/L)	0.0237		0.0304		0.129
	Antimony (Sb)-Total (mg/L)	0.00051		0.00047		0.00027
	Arsenic (As)-Total (mg/L)	0.00122		0.00230		0.00071
	Barium (Ba)-Total (mg/L)	0.0516		0.0627		0.0586
	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)	0.065		<0.010		0.014
	Cadmium (Cd)-Total (mg/L)	0.000045		0.000094		0.000086
	Calcium (Ca)-Total (mg/L)	83.3		92.7		89.5
	Chromium (Cr)-Total (mg/L)	0.00079		0.00050		0.00070
	Cobalt (Co)-Total (mg/L)	0.00072		0.00182		0.00078
	Copper (Cu)-Total (mg/L)	0.00244		0.00288		0.00285
	Iron (Fe)-Total (mg/L)	0.328		0.268		0.597
	Lead (Pb)-Total (mg/L)	<0.000050		<0.000050		0.000263
	Lithium (Li)-Total (mg/L)	0.0142		0.00492		0.00399
	Magnesium (Mg)-Total (mg/L)	63.3		49.0		40.7
	Manganese (Mn)-Total (mg/L)	0.146		0.304		0.388
	Mercury (Hg)-Total (mg/L)	<0.000010		<0.000010		<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00183		0.00139		0.00169
	Nickel (Ni)-Total (mg/L)	0.0188		0.0148		0.00526
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050		<0.050
	Potassium (K)-Total (mg/L)	0.97		0.59		0.62
	Selenium (Se)-Total (mg/L)	0.00123		0.00291		0.00330
	Silicon (Si)-Total (mg/L)	4.79		5.18		4.84
	Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		0.000011
	Sodium (Na)-Total (mg/L)	5.24		5.00		3.51
	Strontium (Sr)-Total (mg/L)	0.565		0.538		0.460

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1521155-16 Surface Water 20-SEP-14 11:55 R2	L1521155-17 Surface Water 20-SEP-14 14:30 SL		
Grouping	Analyte				
WATER					
Physical Tests	Hardness (as CaCO3) (mg/L)	370	990		
	Total Suspended Solids (mg/L)	<3.0	4.0		
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0082	<0.0050		
	Nitrate (as N) (mg/L)	0.0402	<0.050 ^{DLA}		
	Nitrite (as N) (mg/L)	<0.0010	<0.010 ^{DLA}		
	Total Kjeldahl Nitrogen (mg/L)	0.238	0.216		
	Phosphorus (P)-Total (mg/L)	0.0063	0.0034		
	Sulfate (SO4) (mg/L)	172	721		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	9.89	7.79		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0714	0.0214		
	Antimony (Sb)-Total (mg/L)	0.00054	0.00354		
	Arsenic (As)-Total (mg/L)	0.00089	0.0152		
	Barium (Ba)-Total (mg/L)	0.0523	0.0199		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	0.016	0.051		
	Cadmium (Cd)-Total (mg/L)	0.000029	0.000026		
	Calcium (Ca)-Total (mg/L)	65.8	226		
	Chromium (Cr)-Total (mg/L)	0.00072	0.00156		
	Cobalt (Co)-Total (mg/L)	0.00024	0.00012		
	Copper (Cu)-Total (mg/L)	0.00184	0.00133		
	Iron (Fe)-Total (mg/L)	0.316	0.035		
	Lead (Pb)-Total (mg/L)	0.000056	<0.000050		
	Lithium (Li)-Total (mg/L)	0.00622	0.0111		
	Magnesium (Mg)-Total (mg/L)	49.0	101		
	Manganese (Mn)-Total (mg/L)	0.122	0.00325		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	0.000833	0.00196		
	Nickel (Ni)-Total (mg/L)	0.00320	0.0183		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	0.79	1.48		
	Selenium (Se)-Total (mg/L)	0.00068	0.0105		
	Silicon (Si)-Total (mg/L)	5.80	5.42		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	3.33	2.59		
Strontium (Sr)-Total (mg/L)	0.392	1.10			

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1521155-1	L1521155-2	L1521155-3	L1521155-4	L1521155-5
		Description	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	19-SEP-14	19-SEP-14	20-SEP-14	20-SEP-14	19-SEP-14
		Sampled Time	11:02		15:10		13:45
		Client ID	E1	DUP 1	E1	DUP 1	GWCC-5
Grouping	Analyte						
WATER							
Total Metals	Sulfur (S)-Total (mg/L)		46.7	47.0			98.6
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010			0.000017
	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)		0.00192	0.00193			0.00220
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010			<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0030	<0.0030			<0.0030
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD			FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD			FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0322	0.0293			0.0018
	Antimony (Sb)-Dissolved (mg/L)		0.00033	0.00033			0.00091
	Arsenic (As)-Dissolved (mg/L)		0.00076	0.00069			0.00065
	Barium (Ba)-Dissolved (mg/L)		0.0552	0.0518			0.0545
	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	<0.010			0.034
	Cadmium (Cd)-Dissolved (mg/L)		0.000037	0.000035			0.000089
	Calcium (Ca)-Dissolved (mg/L)		61.5	61.6			123
	Chromium (Cr)-Dissolved (mg/L)		0.00054	0.00047			0.00068
	Cobalt (Co)-Dissolved (mg/L)		0.00028	0.00024			<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00314	0.00265			0.00100
	Iron (Fe)-Dissolved (mg/L)		0.210	0.202			0.011
	Lead (Pb)-Dissolved (mg/L)		0.000055	<0.000050			<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00315	0.00298			0.00995
	Magnesium (Mg)-Dissolved (mg/L)		30.3	30.5			56.8
	Manganese (Mn)-Dissolved (mg/L)		0.0947	0.0831			0.00208
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010			<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.00123	0.00125			0.00181
	Nickel (Ni)-Dissolved (mg/L)		0.00514	0.00459			0.0165
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050			<0.050
	Potassium (K)-Dissolved (mg/L)		0.57	0.57			0.96
	Selenium (Se)-Dissolved (mg/L)		0.00148	0.00158			0.00501
	Silicon (Si)-Dissolved (mg/L)		4.51	4.50			4.75
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010			<0.000010
	Sodium (Na)-Dissolved (mg/L)		2.66	2.32			3.90
	Strontium (Sr)-Dissolved (mg/L)		0.290	0.282			0.745
	Sulfur (S)-Dissolved (mg/L)		46.8	46.9			95.3

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1521155-6 Surface Water 20-SEP-14 15:15 GWCC-5	L1521155-7 Surface Water 19-SEP-14 15:00 E2	L1521155-8 Surface Water 20-SEP-14 15:25 E2	L1521155-9 Surface Water 19-SEP-14 16:20 E3	L1521155-10 Surface Water 20-SEP-14 15:25 E3
Grouping	Analyte					
WATER						
Total Metals	Sulfur (S)-Total (mg/L)		86.1		88.2	
	Thallium (Tl)-Total (mg/L)		0.000022		<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)		0.00228		0.00435	
	Vanadium (V)-Total (mg/L)		<0.0010		<0.0010	
	Zinc (Zn)-Total (mg/L)		<0.0030		<0.0030	
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	
	Dissolved Metals Filtration Location		FIELD		FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0198		0.0188	
	Antimony (Sb)-Dissolved (mg/L)		0.00047		0.00094	
	Arsenic (As)-Dissolved (mg/L)		0.00107		0.00110	
	Barium (Ba)-Dissolved (mg/L)		0.0512		0.0541	
	Beryllium (Be)-Dissolved (mg/L)		<0.00010		<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050		<0.00050	
	Boron (B)-Dissolved (mg/L)		0.044		0.082	
	Cadmium (Cd)-Dissolved (mg/L)		0.000049		0.000013	
	Calcium (Ca)-Dissolved (mg/L)		80.8		80.8	
	Chromium (Cr)-Dissolved (mg/L)		0.00058		0.00075	
	Cobalt (Co)-Dissolved (mg/L)		0.00065		0.00026	
	Copper (Cu)-Dissolved (mg/L)		0.00223		0.00166	
	Iron (Fe)-Dissolved (mg/L)		0.303		0.093	
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050	
	Lithium (Li)-Dissolved (mg/L)		0.00999		0.00513	
	Magnesium (Mg)-Dissolved (mg/L)		56.2		63.8	
	Manganese (Mn)-Dissolved (mg/L)		0.110		0.0876	
	Mercury (Hg)-Dissolved (mg/L)		<0.000010		<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)		0.00153		0.00123	
	Nickel (Ni)-Dissolved (mg/L)		0.0151		0.0106	
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	
	Potassium (K)-Dissolved (mg/L)		0.87		0.88	
	Selenium (Se)-Dissolved (mg/L)		0.00144		0.00079	
	Silicon (Si)-Dissolved (mg/L)		4.68		5.83	
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	
	Sodium (Na)-Dissolved (mg/L)		3.73		4.46	
	Strontium (Sr)-Dissolved (mg/L)		0.422		0.356	
	Sulfur (S)-Dissolved (mg/L)		86.0		88.6	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1521155-11 Surface Water 19-SEP-14 18:38 E4	L1521155-12 Surface Water 20-SEP-14 15:35 E4	L1521155-13 Surface Water 19-SEP-14 17:35 R4	L1521155-14 Surface Water 20-SEP-14 15:40 R4	L1521155-15 Surface Water 20-SEP-14 10:10 R1
Grouping	Analyte					
WATER						
Total Metals	Sulfur (S)-Total (mg/L)	93.0		78.1		74.8
	Thallium (Tl)-Total (mg/L)	0.000017		<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)	0.00252		0.00641		0.00285
	Vanadium (V)-Total (mg/L)	<0.0010		<0.0010		<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030		0.0050		0.0043
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD		FIELD		FIELD
	Dissolved Metals Filtration Location	FIELD		FIELD		FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0146		0.0124		0.0132
	Antimony (Sb)-Dissolved (mg/L)	0.00051		0.00048		0.00022
	Arsenic (As)-Dissolved (mg/L)	0.00112		0.00226		0.00056
	Barium (Ba)-Dissolved (mg/L)	0.0500		0.0624		0.0535
	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)	0.057		<0.010		0.011
	Cadmium (Cd)-Dissolved (mg/L)	0.000045		0.000084		0.000067
	Calcium (Ca)-Dissolved (mg/L)	84.6		96.8		93.3
	Chromium (Cr)-Dissolved (mg/L)	0.00062		0.00038		0.00026
	Cobalt (Co)-Dissolved (mg/L)	0.00068		0.00179		0.00065
	Copper (Cu)-Dissolved (mg/L)	0.00207		0.00205		0.00193
	Iron (Fe)-Dissolved (mg/L)	0.260		0.198		0.310
	Lead (Pb)-Dissolved (mg/L)	<0.000050		<0.000050		<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0138		0.00504		0.00339
	Magnesium (Mg)-Dissolved (mg/L)	63.6		50.1		40.9
	Manganese (Mn)-Dissolved (mg/L)	0.138		0.299		0.348
	Mercury (Hg)-Dissolved (mg/L)	<0.000010		<0.000010		<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00166		0.00131		0.00156
	Nickel (Ni)-Dissolved (mg/L)	0.0181		0.0146		0.00451
	Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050		<0.050
	Potassium (K)-Dissolved (mg/L)	1.00		0.60		0.60
	Selenium (Se)-Dissolved (mg/L)	0.00128		0.00305		0.00378
	Silicon (Si)-Dissolved (mg/L)	4.75		5.24		4.71
	Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)	5.20		4.99		3.24
	Strontium (Sr)-Dissolved (mg/L)	0.533		0.549		0.426
	Sulfur (S)-Dissolved (mg/L)	91.1		78.7		73.7

* 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	L1521155-16 Surface Water 20-SEP-14 11:55 R2	L1521155-17 Surface Water 20-SEP-14 14:30 SL			
Grouping	Analyte				
WATER					
Total Metals	Sulfur (S)-Total (mg/L)	58.9	234		
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000018		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	0.00474	0.00313		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030		
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		
	Dissolved Metals Filtration Location	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0181	0.0012		
	Antimony (Sb)-Dissolved (mg/L)	0.00051	0.00342		
	Arsenic (As)-Dissolved (mg/L)	0.00082	0.0148		
	Barium (Ba)-Dissolved (mg/L)	0.0503	0.0192		
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050		
	Boron (B)-Dissolved (mg/L)	0.013	0.048		
	Cadmium (Cd)-Dissolved (mg/L)	0.000025	0.000023		
	Calcium (Ca)-Dissolved (mg/L)	67.0	230		
	Chromium (Cr)-Dissolved (mg/L)	0.00047	0.00099		
	Cobalt (Co)-Dissolved (mg/L)	0.00020	<0.00010		
	Copper (Cu)-Dissolved (mg/L)	0.00163	0.00080		
	Iron (Fe)-Dissolved (mg/L)	0.212	<0.010		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.00611	0.0105		
	Magnesium (Mg)-Dissolved (mg/L)	49.1	101		
	Manganese (Mn)-Dissolved (mg/L)	0.119	0.00240		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000730	0.00173		
	Nickel (Ni)-Dissolved (mg/L)	0.00305	0.0168		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	0.80	1.46		
	Selenium (Se)-Dissolved (mg/L)	0.00070	0.0103		
	Silicon (Si)-Dissolved (mg/L)	5.70	5.35		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	3.30	2.34		
	Strontium (Sr)-Dissolved (mg/L)	0.361	0.971		
	Sulfur (S)-Dissolved (mg/L)	57.9	230		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1521155-6	L1521155-7	L1521155-8	L1521155-9	L1521155-10
Description	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sampled Date	20-SEP-14	19-SEP-14	20-SEP-14	19-SEP-14	20-SEP-14
Sampled Time	15:15	15:00	15:25	16:20	15:25
Client ID	GWCC-5	E2	E2	E3	E3
Grouping	Analyte				
WATER					
Dissolved Metals	Thallium (Tl)-Dissolved (mg/L)	0.000020		<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)	0.00202		0.00382	
	Vanadium (V)-Dissolved (mg/L)	<0.0010		<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	0.0017		0.0028	

* 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
	L1521155-11	Surface Water	19-SEP-14	18:38	E4
	L1521155-12	Surface Water	20-SEP-14	15:35	E4
	L1521155-13	Surface Water	19-SEP-14	17:35	R4
	L1521155-14	Surface Water	20-SEP-14	15:40	R4
	L1521155-15	Surface Water	20-SEP-14	10:10	R1
Grouping	Analyte				
WATER					
Dissolved Metals	Thallium (Tl)-Dissolved (mg/L)	0.000020		<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)	0.00235		0.00678	0.00269
	Vanadium (V)-Dissolved (mg/L)	<0.0010		<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0012		0.0038	0.0022

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1521155-16	L1521155-17		
	Description	Surface Water	Surface Water		
	Sampled Date	20-SEP-14	20-SEP-14		
	Sampled Time	11:55	14:30		
	Client ID	R2	SL		
Grouping	Analyte				
WATER					
Dissolved Metals	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000015		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.00419	0.00284		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.0022	<0.0010		

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1521155-7	E2	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

QC Samples with Qualifiers & Comments:

QC Type	Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike		Sulfate (SO4)	MS-B	L1521155-10, -12, -14, -15, -16, -17, -3, -4, -6, -8
Matrix Spike		Sodium (Na)-Dissolved	MS-B	L1521155-1, -11, -13, -15, -16, -17, -2, -5, -7, -9
Matrix Spike		Strontium (Sr)-Dissolved	MS-B	L1521155-1, -11, -13, -15, -16, -17, -2, -5, -7, -9
Matrix Spike		Sulfur (S)-Dissolved	MS-B	L1521155-1, -11, -13, -15, -16, -17, -2, -5, -7, -9
Matrix Spike		Dissolved Organic Carbon	MS-B	L1521155-1, -2

Qualifiers for Individual Parameters Listed:

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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ANIONS-NO2-IC-WR	Water	Nitrite Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.			
ANIONS-NO3-IC-WR	Water	Nitrate Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.			
ANIONS-SO4-IC-WR	Water	Sulphate by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
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).			
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 -			

Reference Information

optical emission spectrophotometry (EPA Method 6010B).

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

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

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

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

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

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

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

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

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.

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.

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

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

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

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

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

Chain of Custody Numbers:

10-152908 10-152909

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 / Analytical Reque:
 Canada Toll Free: 1 800 668 987
 www.alsglobal.com



L1521155-COFC

19-152909

Page 2 of 2

Report To	Report Format / Distribution	Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company: <u>Hemmera</u>	Standard: <input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)
Contact: <u>Natasha Sandys</u>	Select: PDF Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: <u># 203-7237 2nd Ave</u>	Email 1: <u>Aaron Nicholson (ELR) Chris Jostkowski (ELP)</u>	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
<u>Whitehorse YT</u>	Email 2: <u>Natasha Sandys (Hemmera) Andrew Bram</u>	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: <u>8674564065</u> Fax:	<u>Hemmera Lab Data/Drucke</u> (Hemmera)	

Invoice To Same as Report? (circle) Yes or No (if No, provide details)	Client / Project Information	Analysis Request (Indicate Filtered or Preserved, F/P)																	
Copy of Invoice with Report? (circle) Yes or No	Job #: <u>Hemmera 1343-005.04</u>	F	P																
Company:	<u>POWAPL → ELR 14-183</u>																		
Contact: <u>SAME AS REPORT</u>	LSD:																		
Address:	Quote #: <u>Q46959 (Cattin' Natasha)</u>																		
Phone: Fax:	ALS Contact: <u>B Mack</u>																		
Lab Work Order # (lab use only)	Sampler: <u>A Nicholson</u>																		
	<u>A Bram</u>																		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Dis Nitrites (Low Level)	Total Nitrites (Low Level)	Nitrate Nitrite Sulphate	Total P	Ammonia	TSS	DGC	Total K	N	Total Phosphorus	Number of Containers
13	R4	19-009-14	17:35	SW	✓	✓			✓		✓				6
14	R4	20-009-14	15:40	↓			✓	✓	✓			✓	✓		1
15	R2	20-009-14	10:10	↓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7
16	R2	20-009-14	11:55	↓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7
17	SL	20-009-14	14:30	↓	✓	✓	✓	✓	✓	✓	✓	✓	✓		7

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

CCME Stds. Note hold time on anions require analysis in Whitehorse upon receipt

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: <u>A. Nicholson via Air North</u>	Date: <u>21 Sept 2014</u>	Time: <u>0845</u>	Received by: <u>Shayon</u>	Date: <u>Sept. 23</u>	Time: <u>14:45</u>	Temperature: <u>3.5 °C</u>	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF