July 2016 Clinton Creek Surface Water Quality and Hydrological Monitoring Program
Monthly Summary Report

Prepared for:
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HEMMERA

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1.0 INTRODUCTION

This Work was performed in accordance with Contract C00033502 between Hemmera Envirochem Inc. ("Hemmera") and Government of Yukon (YG), dated May 13, 2016 ("Contract"). In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

Hemmera and Ecological Logistics & Research Ltd. (Hemmera/ELR) were retained by the YG, Assessment and Abandoned Mines (AAM) to conduct a water quality and hydrological monitoring program at the Clinton Creek Mine site during the 2016/2017 fiscal year.

The purpose of this 2016/17 sampling program is to monitor water quality, hydrology, and meteorological station data from the Site as part of the overall care, maintenance and closure program objectives for the Site. The water quality and hydrology scope of work was based on program recommendations developed by Hemmera/ELR in 2015 (Hemmera 2015), while the meteorological station was installed and is managed by AAM, with maintenance work performed by other contractors.

This monthly summary report forms part of our overall scope of work, and is intended to provide a summary of the scope of work performed, a brief overview of methods used, deviations from the intended program scope, as well as raw program data and data summaries.

2.0 JULY 2016 MONITORING PROGRAM SCOPE

The specific scope of work for the July 2016 sampling event included:

- Visiting 17 surface water quality sampling stations and six (6) groundwater seep/pit lake stations to collect *in-situ* water quality measurements and samples for laboratory analysis, where possible.
- Collection of manual discharge measurements at 14 stream locations including flow, stream width, stream depth, and other site characteristics. This included the two sites where automated hydrometric stations are installed.
- Collection of survey data, staff gauge readings, and stream gauging data at two hydrometric monitoring sites.
- Addition of a survey benchmark and reinforcing a staff gauge at one hydrometric monitoring site.
- Completion of a download of the meteorological station data and hydrometric station data that is satellite-linked (hosted by Northern AvCom). The data is downloaded each month and a visual check performed to ensure that the various sensors are functioning and continuing to collect data.
- Collection of *in-situ* water quality measurements and profiles from three (3) sites on Hudgeon Lake at one (1) metre increments.

3.0 SUMMARY OF FIELD ACTIVITIES

Hemmera/ELR successfully completed the monthly field monitoring program during July 18 to July 24, 2016. The program was completed by Norbert Botca of Hemmera and Glenn Rudman of ELR.

Table 1 below presents a summary of the program sample site names and locations, as well as a summary of July 2016 data collection scope for water quality and hydrology. **Table 2** below provides a brief summary of activities completed during the July 2016 field program.

Table 1 Sample Site Descriptions and Locations – July 2016

Station Code	Hydrology Data Collected	Water Quality Data Collected	Station Description	Location (UTM, Zone 7N)	
				Easting	Northing
Exposed Sites					
E1		✓	Clinton Creek downstream of gabions	513645	7147111
E1(H)	✓	✓	Clinton Creek at the outlet of Hudgeon Lake	512806	7147438
E2	✓	✓[1]	Clinton Creek, downstream of Porcupine Creek but upstream of Wolverine Creek	514158	7147076
E3		✓[1]	Wolverine Creek, upstream of culvert	514178	7147189
E3(H)	✓		Wolverine Creek approximately 300 m upstream of the Clinton Creek confluence	514170	7147608
E4	✓	✓	Clinton Creek downstream of Wolverine Creek but upstream of Eagle Creek	515950	7145287
E7	✓	✓	Clinton Creek near mouth	519400	7142042
E8		✓	Forty Mile River downstream of Clinton Creek	519457	7142795
E9[2]			Porcupine Creek at its discharge into Clinton Creek	-	-
Reference Sites					
R1	✓	✓[1]	Clinton Creek upstream of Hudgeon Lake	510718	7147525
R2	✓	✓	Easter Creek upstream of Hudgeon Lake	512023	7148061
R3	✓	✓[1]	Wolverine Creek, upstream of tailings	513952	7148677
R4	✓	✓	Eagle Creek, upstream of culvert	515981	7145344
R6		✓	Forty Mile River, upstream of Clinton Creek	519485	7141731
R7	✓	✓	Porcupine Creek, upstream of waste rock	513026	7145669
R8	✓	✓	Unnamed creek that enters Hudgeon Lake west of Easter Creek	511885	7147805
R9	✓	✓	Unnamed stream input on the south side of Hudgeon Lake	512343	7146753
R11	✓	✓	Unnamed tributary to Wolverine Creek between R3 and E3(H).	514177	7147828
R11(H)[3]	✓		Unnamed tributary to Wolverine Creek between R3 and E3(H).	514160	7147793

Station Code	Hydrology Data Collected	Water Quality Data Collected	Station Description	Location (UTM, Zone 7N)	
				Easting	Northing
Groundwater Seepage and Pit Sites					
GWCC-1		✓	Toe of the Waste Rock dump flowing into ponded area at Porcupine Creek	513902	7146960
GWCC-2		✓	Toe of the Waste Rock dump flowing into ponded area approx. 10 m northwest of GWCC-1	513899	7146968
GWCC-3		✓	Toe of the Waste Rock dump flowing into side channel, approx. 10 m northwest of GWCC-2	513882	7147038
GWCC-4		✓	Toe of the Waste Rock dump flowing into side channel, approx. 10 m northwest of GWCC-3	513868	7147052
GWCC-5	✓	✓	Groundwater flows in old Clinton Creek channel	513984	7147127
SL		✓[4]	Snowshoe Pit Lake from shore	513824	7146703
PL[5]			Porcupine Pit Lake from shore	-	-
Hudgeon Lake *In-Situ* Depth Profile Data Sites					
HL1		✓	Hudgeon Lake, near the west end	511284	7147219
HL2		✓	Hudgeon Lake, near the center	511924	7147168
HL3		✓	Hudgeon Lake, close to the outlet	512485	7147190

[1] – Asbestos sample collected monthly in addition to regular program analytical set.
[2] – Site E9 was not established during the July program as there was no surface water flow at the site.
[3] – Site R11(H) was established during the July program identifies a slightly different location from R11 which is better suited to stream gauging requirements.
[4] – Survey data is also collected to record water elevation.
[5] – Porcupine Pit is included as a program station for water quality sampling, but has not been sampled due to concerns with pit wall stability.

Table 2 Field Program Activity Summary

Task	Summary of Task and Program Observations / Anomalies
Surface Water Quality Sampling	Sampling was successfully completed at 16 surface water stations out of a total of 17 stations; Station E9 was dry and a sample could not be collected. The 16 collected samples were received by the lab within required hold times.
Stream Gauging	Stream gauging was successfully completed at 14 hydrology sites.
Surveying of Hydrometric Sites	Surveys of benchmarks and instruments at the two hydrometric sites were completed and compared on-site to previous surveys. A third benchmark (BM3) was added/surveyed and the staff gauge was reinforced Site E1(H).
Meteorological Station and Hydrometric Station Download/Check	The meteorological station near E1(H) was visually assessed. Data was downloaded and reviewed and all data through to the end of July 2016 appear to be complete.
Hudgeon Lake In-Situ Measurements	*In-situ* depth profile measurements were measured and collected in one (1) metre depth increments for identified parameters at the three previously established sites.

4.0 JULY 2016 MONITORING PROGRAM RESULTS SUMMARY

4.1 SURFACE WATER QUALITY ANALYTICAL RESULTS AND EXCEEDANCES

Laboratory analytical results are presented in **Table 3.1**, attached to this report. Laboratory analytical results are compared to Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FAL; CCME, 2014) guidelines, where exceedances of CCME-FAL guidelines are shaded grey. In several instances, laboratory reportable detection limits (RDL) for parameters exceeded applicable CCME FAL standards (lightly shaded values in **Table 3.1**). In these cases, samples having elevated levels of certain parameters required laboratory dilution prior to performing the required analyses, thereby resulting in an elevated RDL. For the purpose of this report, samples where the reported RDL is greater than the applicable guideline have not been reported as CCME FAL exceedances. Laboratory analytical reports are provided in **Appendix 1**, while field forms are provided in **Appendix 2**.

For sites where duplicate samples were collected, corresponding monitoring and duplicate sample results were compared to the QA/QC analysis threshold of 20% Relative Percent Difference (RPD). The analytical results for field blanks and travel blanks were reviewed for any parameter detections. QA/QC results are presented in **Table 3.2**, attached to this report.

For the July program, no exceedences of the 20% RPD threshold occurred. Ammonia was detected in both travel blanks, however ammonia exceedances can normally occur from time to time in travel blanks due to the age of the water used in their manufacture. A slight detection of total manganese was noted in the program field blank (0.00011 mg/L compared to detection limit of 0.00010 mg/L).

A condensed summary of CCME FAL guideline exceedances in the July 2016 water quality results is provided in **Table 4** below, for ease of review.

Table 4 Summary of CCME FAL Guideline Exceedances for July 2016 Sampling Program

		Site Type	Reference Sites								
		Site Location	R1	R2	R3	R4	R6	R7	R8	R9	R11
		Date Sampled	7/23/2016	7/23/2016	7/19/2016	7/21/2016	7/22/2016	7/20/2016	7/23/2016	7/23/2016	7/19/2016
		Site Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good
Parameter	Units	CCME-FAL[1]									
Physical Tests											
Field Dissolved Oxygen	mg/L	9.5 [6]									
Dissolved Metals											
Aluminum Dissolved	mg/L	Varies					0.112			0.198	
Aluminum CCME-FAL	*mg/L*	*-*					*0.1000*			*0.1000*	
Arsenic Dissolved	mg/L	0.005									
Hexavalent Chromium Dissolved	mg/L	0.001									
Copper Dissolved	mg/L	Varies						0.00370		0.00521	
Copper CCME-FAL	*mg/L*	*-*						*0.00334*		*0.00286*	
Iron Dissolved	mg/L	0.3		0.503				1.47		0.985	
Selenium Dissolved	mg/L	0.001	0.00160			0.00185					
Total Metals											
Aluminum Total	mg/L	Varies	5.07	4.60	3.08	1.55	2.54	1.93	0.191	8.54	0.112
Aluminum CCME-FAL	*mg/L*	*-*	*0.1000*	*0.1000*	*0.1000*	*0.10000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*
Arsenic Total	mg/L	0.005	0.00547							0.00662	
Cadmium Total	mg/L	Varies	0.000403							0.000342	
Cadmium CCME-FAL	*mg/L*	*-*	*0.000304*							*0.000191*	
Trivalent (III) Chromium Total	mg/L	0.0089	0.0139	0.00993						0.0183	
Hexavalent (VI) Chromium Total	mg/L	0.001		0.0011						0.0011	
Copper Total	mg/L	Varies	0.0161	0.00914	0.00942	0.00625		0.00782	0.00365	0.0247	
Copper CCME-FAL	*mg/L*	*-*	*0.004*	*0.004*	*0.004*	*0.004*		*0.00334*	*0.00304*	*0.00286*	
Iron Total	mg/L	0.3	9.02	7.13	5.98	2.64	3.78	4.38	0.334	14.1	
Lead Total	mg/L	Varies								0.00593	
Lead CCME-FAL	*mg/L*	*-*								*0.00423*	
Mercury Total	mg/L	0.000026	0.000155							<0.000050	
Selenium Total	mg/L	0.001	0.00204			0.00180				0.00119	
Silver Total	mg/L	0.00025	0.000171							0.000129	
Zinc Total	mg/L	0.03	0.0413							0.0476	

Notes: [1] Please see the Notes attached to Tables 1 and 2 for explanations of CCME-FAL Guidelines

Table 4 Summary of CCME FAL Guideline Exceedances for July 2016 Sampling Program (con't)

		Site Type	Exposure Sites							Groundwater Seepage Sites					
		Site Location	E1	E1-H	E2	E3	E4	E7	E8	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5
		Date Sampled	7/22/2016	7/22/2016	7/21/2016	7/20/2016	7/21/2016	7/22/2016	7/22/2016	7/24/2016	7/20/2016	7/20/2016	7/20/2016	7/20/2016	7/22/2016
		Site Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good		Good
Parameter	Units	CCME-FAL[1]													
Physical Tests															
Field Dissolved Oxygen	mg/L	9.5 [6]	8.88	8.5	8.12		9.19	9.44		8.84	4.26	7.24	4.23	2.19	3.94
Dissolved Metals															
Aluminum Dissolved	mg/L	Varies													
Aluminum CCME-FAL	*mg/L*	-													
Arsenic Dissolved	mg/L	0.005								0.0144					
Hexavalent Chromium Dissolved	mg/L	0.001								0.0016	0.0034				
Copper Dissolved	mg/L	Varies													
Copper CCME-FAL	*mg/L*	-													
Iron Dissolved	mg/L	0.3													
Selenium Dissolved	mg/L	0.001	0.00187	0.00176	0.00157		0.00137	0.00114		0.0156	0.00451	0.00339	0.00165		0.00769
Total Metals															
Aluminum Total	mg/L	Varies				0.402		2.71	2.58		0.157				
Aluminum CCME-FAL	*mg/L*	-				*0.1000*		*0.1000*	*0.1000*		*0.1000*				
Arsenic Total	mg/L	0.005								0.0151					
Cadmium Total	mg/L	Varies													
Cadmium CCME-FAL	*mg/L*	-													
Trivalent (III) Chromium Total	mg/L	0.0089													
Hexavalent (IV) Chromium Total	mg/L	0.001				0.0012				0.0018	0.0034	0.0017			
Copper Total	mg/L	Varies						0.00960							
Copper CCME-FAL	*mg/L*	-						*0.004*							
Iron Total	mg/L	0.3				0.905		4.79	3.47						
Lead Total	mg/L	Varies													
Lead CCME-FAL	*mg/L*	-													
Mercury Total	mg/L	0.000026													
Selenium Total	mg/L	0.001	0.00169	0.00170	0.00162		0.00134	0.00135		0.0160	0.00409	0.00324	0.00144		0.00742
Silver Total	mg/L	0.00025													
Zinc Total	mg/L	0.03						0.0322							

Notes: [1] Please see the Notes attached to Tables 1 and 2 for explanations of CCME-FAL Guidelines

4.2 HUDGEON LAKE *IN-SITU* PROFILE DATA

The raw Hudgeon Lake *in-situ* profile data for the July 2016 monitoring event is provided in **Appendix 3**.

4.3 STREAM GAUGING DATA

The tabulated stream gauging data from the July 2016 monitoring event is provided in **Appendix 4**.

4.4 HYDROMETRIC STATION SURVEY DATA

The survey data collected from the Wolverine Creek and Hudgeon Lake hydrometric stations is provided in **Appendix 5**. The survey data from the July sampling event continue to suggest that one of the structures at the Hudgeon Lake hydrometric station site have moved slightly; this issue is being addressed through the installation of additional benchmarks at the Site (a third benchmark, *BM3*, was installed and surveyed during the July field program). Additionally, the staff gauge at Site BM3 was reinforced with extra rebar during the July program.

5.0 RECOMMENDATIONS

Hemmera/ELR have prepared the following recommendations based on the observations and results of the July 2016 water quality and hydrological monitoring program:

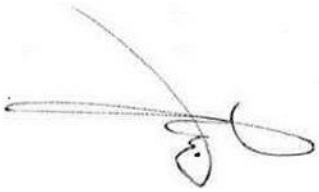
1. Continue sampling and monitoring flow at R11. The site appears viable with significant input into Wolverine Creek.

6.0 CLOSURE

Hemmera/ELR are pleased to provide the Government of Yukon, Assessment and Abandoned Mines this report that summarizes the July 2016 water quality and hydrological monitoring program at the Clinton Creek Site. Please do not hesitate to contact us should you have any questions regarding this report.

Sincerely,

Written by:
Hemmera Envirochem Inc.



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7.0 REFERENCES

Canadian Council of Ministers of the Environment (CCME). 2014. Canadian Water Quality Guidelines for the Protection of Aquatic Life. Accessed online at http://st-ts.ccme.ca/, July 2014.

TABLES

Table 3.1: Analytical Chemistry Data

		Site Type	Reference Sites									Exposure Sites									Groundwater Seepage Sites				
		Site Location	Clinton Creek	Easter Creek	Wolverine Creek	Eagle Creek	Forty-Mile River	Porcupine Creek	Unnamed Creek	Unnamed Creek	Unnamed Creek	Clinton Creek	Clinton Creek	Clinton Creek	Wolverine Creek	Clinton Creek	Clinton Creek	Forty-Mile River	Porcupine Creek	Snowshoe Pit	Waste Rock Seepage				Abandoned Channel
		Sample ID	R1	R2	R3	R4*	R6*	R7	R8	R9	R11	E1*	E1(H)*	E2*	E3	E4*	E7*	E8*	E9	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5*
		Date Sampled	23/07/2016	23/07/2016	19/07/2016	21/07/2016	22/07/2016	20/07/2016	23/07/2016	23/07/2016	19/07/2016	22/07/2016	22/07/2016	21/07/2016	20/07/2016	21/07/2016	22/07/2016	22/07/2016	24/07/2016	24/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016	22/07/2016
		ALS Work Order	L1803696	L1803696	L1802392	L1803696	L1803696	L1802392	L1803696	L1803696	L1802392	L1803696	L1803696	L1803696	L1802392	L1803696	L1803696	L1803696		L1803696	L1802392	L1802392	L1802392	L1802392	L1803696
Parameter	Units	CCME-FAL[1, 2, 3, 4]	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Dry	Good	Good	Good	Good	Good	Good
Physical Tests																									
Lab pH	pH units	6.5-9.0 [5]	7.87	7.99	8.12	8.17	7.74	7.55	7.74	7.52	8.01	8.16	7.93	8.12	8.20	8.08	8.09	7.78	-	8.37	7.63	7.80	7.73	7.69	7.98
Field pH	pH units	6.5-9.0 [5]	7.88	7.99	8.27	-	7.88	7.43	7.72	7.64	8.11	8.3	8.04	8.1	8.15	-	8.06	7.89	-	8.5	7.4	7.62	7.48	7.49	7.51
Field Temperature	C	-	6.1	8.2	7.7	4.9	10.5	5.3	6.6	6	5.7	14.4	14.3	14.4	8.2	13	11.7	10.6	-	14.6	4.2	7.6	10.9	11.6	9.1
Lab Conductivity	uS/cm	-	422	416	816	535	152	293	280	240	484	549	546	604	823	630	624	162	-	1600	2420	1680	1030	822	962
Field Conductivity	uS/cm	-	242.5	265.9	545	389.2	112.7	167.5	172.3	143.4	303.9	397.7	399.1	502	604	532	496.5	118.6	-	1216	1375	1046	690	559	651
Field Specific Conductivity	uS/cm	-	379.9	391.3	813	632	155.7	268.7	265.5	225.3	481.9	499.1	501	630	890	689	665	163.8	-	1519	2283	1564	946	750	935
Field Dissolved Oxygen	mg/L	9.5 [6]	11.35	10.93	12.19	11.85	9.79	10.63	10.87	11.49	13.92	8.88	8.5	8.12	10.93	9.19	9.44	10.29	-	8.84	4.26	7.24	4.23	2.19	3.94
Field Oxidation - Redox Potent	mV	-	59.1	50.3	165.3	136.4	126.7	47	53.7	46.9	168.5	154.8	159.7	135.5	368.5	138.5	135.2	98.6	-	75.5	211	199.4	158.9	200	109.4
Total Suspended Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hardness (as CaCO3)	mg/L	-	219	225	470	395	74.7	150	134	125	227	289	289	389	484	429	413	80.0	-	1020	1680	1110	612	471	562
Anions and Nutrients																									
Nitrate (as N)	mg/L	13	0.258	0.0475	0.0523	0.160	0.0967	0.0980	<0.0050	0.212	0.0904	0.116	0.120	0.112	0.189	0.108	0.139	0.0982	-	<0.010	0.521	0.356	0.170	0.0861	0.0053
Nitrite (as N)	mg/L	0.06	<0.0010	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	0.0041	<0.0010	0.0047	<0.0010	<0.0010	<0.0010	-	<0.0020	<0.0050	<0.0050	<0.0020	<0.0010	<0.0010
Ammonia, Total (as N)	mg/L	Varies [7]	0.0610	0.0352	0.0397	0.0229	0.0174	0.0794	0.0072	0.114	<0.0050	0.0179	0.0150	0.0159	0.0095	0.0110	0.0336	0.0172	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ammonia CCME-FAL	*mg/L*	-	*1.859*	*1.226*	*0.6784*	*0.4128*	*1.317*	*5.551*	*2.574*	*3.243*	*1.138*	*0.3843*	*0.6888*	*0.5980*	*0.8543*	*0.1965*	*0.8000*	*1.277*	-	*0.2460*	*6.50*	*2.988*	*3.179*	*2.943*	*3.415*
Sulfate (SO4)	mg/L	-	117	104	274	137	23.2	70.9	80.6	60.4	131	158	159	184	265	193	187	26.4	-	735	1270	790	388	257	310
Inorganic/Organic Carbon																									
Dissolved Organic Carbon	mg/L	-	18.3	18.9	13.4	11.8	15.1	27.3	18.8	34.3	14.1	14.4	14.5	13.4	12.5	12.5	13.7	15.3	-	8.56	5.33	7.04	8.95	9.53	7.16
Asbestos																									
Total Asbestos	MFL	-	<AS	-	<AS	-	-	-	-	-	-	-	-	1	43.98	-	-	-	-	-	-	-	-	-	-
Dissolved Metals																									
Aluminum (Al)-Dissolved	mg/L	Varies [8]	0.0749	0.0941	0.0218	0.0146	0.112	0.0760	0.0456	0.198	0.0260	0.0319	0.0385	0.0248	0.0166	0.0168	0.0268	0.0995	-	0.0018	0.0010	0.0011	0.0015	0.0014	0.0015
Aluminum CCME-FAL	*mg/L*	-	*0.1000*	*0.1000*	*0.1000*	*0.10000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.100*	*0.1000*	*0.100*	*0.1000*	*0.10000*	*0.1000*	*0.1000*	-	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*
Antimony (Sb)-Dissolved	mg/L	-	0.00026	0.00034	0.00018	0.00035	0.00011	0.00021	0.00105	0.00023	0.00018	0.00028	0.00029	0.00038	0.00097	0.00047	0.00038	0.00011	-	0.00281	0.00133	0.00125	0.00106	0.00119	0.00076
Arsenic (As)-Dissolved	mg/L	0.005	0.00067	0.00095	0.00076	0.00234	0.00071	0.00154	0.00043	0.00136	0.00057	0.00080	0.00075	0.00100	0.00117	0.00110	0.00099	0.00063	-	0.0144	0.00209	0.00141	0.00091	0.00124	0.00069
Barium (Ba)-Dissolved	mg/L	-	0.0509	0.0630	0.0594	0.0694	0.0389	0.115	0.0499	0.0879	0.0619	0.0586	0.0587	0.0538	0.0639	0.0526	0.0638	0.0369	-	0.0279	0.0183	0.0207	0.0349	0.0365	0.0536
Beryllium (Be)-Dissolved	mg/L	-	<0.000020	0.000020	<0.000020	<0.000020	0.000024	0.000025	<0.000020	0.000034	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000021	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.028	0.083	0.043	0.034	<0.010	-	0.041	0.278	0.123	0.073	0.060	0.030
Cadmium (Cd)-Dissolved	mg/L	Varies [9]	0.0000465	0.0000131	0.0000094	0.0000511	0.0000170	0.0000164	0.0000318	0.0000361	0.0000159	0.0000319	0.0000322	0.0000506	0.0000112	0.0000353	0.0000382	0.0000083	-	0.0000139	0.000187	0.000142	0.0000754	0.0000463	0.000109
Cadmium CCME-FAL	*mg/L*	-	*0.000304*	*0.000311*	*0.00037*	*0.00037*	*0.0001244*	*0.000222*	*0.000202*	*0.000191*	*0.000313*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001317*	-	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Dissolved	mg/L	-	55.1	39.9	83.0	85.3	19.9	33.5	33.1	32.2	51.1	63.4	64.0	75.7	77.4	78.7	76.1	20.9	-	230	194	155	105	85.9	126
Chromium (Cr)-Dissolved	mg/L	-	0.00053	0.00103	0.00040	0.00030	0.00040	0.00116	0.00107	0.00145	0.00057	0.00036	0.00035	0.00040	0.00061	0.00047	0.00049	0.00037	-	0.00104	0.00257	0.00098	0.00043	0.00042	0.00062
Trivalent Chromium (III)-Dissolved	mg/L	0.0089	-	<0.00042	-	-	-	0.00116	0.00107	0.00045	-	-	-	-	-	-	-	-	-	<0.00042	<0.00058	-	-	-	-
Hexavalent Chromium (VI)-Dissolved	mg/L	0.001	-	0.0010	-	-	-	<0.0010	<0.0010	0.0010	-	-	-	-	-	-	-	-	-	0.0016	0.0034	-	-	-	-
Cobalt (Co)-Dissolved	mg/L	-	0.00038	0.00036	0.00041	0.00089	0.00031	0.00082	<0.00010	0.00082	0.00011	0.00031	0.00040	0.00052	0.00025	0.00047	0.00063	0.00028	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Dissolved	mg/L	Varies [10]	0.00322	0.00219	0.00167	0.00175	0.00305	0.00370	0.00236	0.00521	0.00182	0.00265	0.00272	0.00221	0.00156	0.00193	0.00222	0.00274	-	0.00095	0.00095	0.00115	0.00114	0.00121	0.00078
Copper CCME-FAL	*mg/L*	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	*0.00334*	*0.00304*	*0.00286*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	0.292	0.503	0.210	0.162	0.271	1.47	0.083	0.985	0.127	0.137	0.169	0.188	0.121	0.185	0.182	0.279	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.038
Lead (Pb)-Dissolved	mg/L	Varies [11]	0.000100	0.000076	<0.000050	<0.000050	0.000065	0.000060	<0.000050	0.000132	<0.000050	0.000051	0.000063	<0.000050	<0.000050	<0.000050	0.000079	0.000063	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	*mg/L*	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.002195*	*0.00533*	*0.00462*	*0.00423*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.002395*	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*
Lithium (Li)-Dissolved	mg/L	-	0.0018	0.0035	0.0037	0.0038	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	0.0029	0.0067	0.0050	0.0094	0.0082	0.0023	-	0.0102	0.0764	0.0124	0.0079	0.0074	0.0096
Magnesium (Mg)-Dissolved	mg/L	-	19.8	30.4	63.7	44.1	6.11	16.2	12.4	10.8	24.2	31.7	31.5	48.5	70.7	56.4	54.1	6.77	-	109	291	175	85.2	62.2	59.9
Manganese (Mn)-Dissolved	mg/L	-	0.0984	0.0971	0.162	0.150	0.0248	0.383	0.00821	0.209	0.0181	0.0904	0.149	0.0915	0.0849	0.0942	0.203	0.0238	-	0.00165	0.00017	0.00013	0.00012	0.00057	0.00316
Mercury (Hg)-Dissolved	mg/L	0.000026	0.0000070	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000076	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	0.000831	0.000436	0.00117	0.00121	0.000316	0.000550	0.000680	0.000676	0.00104	0.00110	0.00111	0.00143	0.00119	0.00148	0.00132	0.000342	-	0.00170	0.00245	0.00266	0.00241	0.00217	0.00167
Nickel (Ni)-Dissolved	mg/L	Varies [12]	0.00328	0.00340	0.00354	0.0156	0.00239	0.00378	0.00354	0.00426	0.00218	0.00472	0.00393	0.0124	0.00805	0.0142	0.0104	0.00225	-	0.0170	0.0695	0.0376	0.0305	0.0322	0.0193
Nickel CCME-FAL	*mg/L*	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.07657*	*0.130*	*0.119*	*0.113*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.08067*	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Phosphorus (P)-Dissolved	mg/L	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	0.45	0.51	0.80	0.59	0.77	0.22	<0.10	0.29	0.35	0.58	0.59	0.80	0.86	0.92	0.95	0.79	-	1.44	3.34	1.97	1.29	1.18	0.79
Selenium (Se)-Dissolved	mg/L	0.001	0.00160	0.000378	0.000522	0.00185	0.000182	0.000297	0.000790	0.000811	0.000858	0.00187	0.00176	0.00157	0.000978	0.00137	0.00114	0.000173	-	0.0156	0.00451	0.00339	0.00165	0.000980	0.00769
Silicon (Si)-Dissolved	mg/L	-	4.50	5.78	6.13	5.23	5.15	5.45	5.93	5.05	6.26	4.03	4.14	4.32	5.73	4.53	4.62	5.23	-	3.47	6.25	5.34	5.37	6.07	4.52
Silver (Ag)-Dissolved	mg/L	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	1.98	2.30	4.39	5.17	2.97	2.04	3.79	1.70	6.38	2.82	2.76	3.52	5.28	4.29	3.93	2.79	-	2.52	17.3	5.60	3.62	3.20	4.02
Strontium (Sr)-Dissolved	mg/L	-	0.216	0.191	0.410	0.460	0.106	0.102	0.128	0.109	0.253	0.287	0.288	0.398	0.396	0.450	0.411	0.108	-	0.907	1.81	0.802	0.524	0.432	0.697
Sulfur (S)-Dissolved	mg/L	-	39.4	34.5	99.8	64.9	8.67	24.9	27.3	20.1	41.4	52.1	51.9	76.0	96.2	82.3	79.0	9.61	-	245	438	272	131	91.5	105
Thallium (Tl)-Dissolved	mg/L	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000023	<0.000010	0.000020	<0.000010	<0.000010	-	0.000015	0.000078	0.000053	0.000059	0.000073	0.000016
Tin (Sn)-Dissolved	mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	0.00160	0.00198	0.00056	0.00036	0.00148	0.00214	0.00079	0.00395	0.00059	0.00062	0.00084	0.00049	0.00053	0.00045	0.00069	0.00147	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium (U)-Dissolved	mg/L	0.015	0.00109	0.00193	0.00495	0.00442	0.000574	0.000117	0.000061	0.000448	0.00107	0.00180	0.00185	0.00191	0.00369	0.00215	0.00220	0.000611	-	0.00313	0.00613	0.00239	0.00134	0.000998	0.00230
Vanadium (V)-Dissolved	mg/L	-	<0.00050	0.00117	0.00077	<0.00050	0.00108	0.00125	<0.00050	0.00154	<0.00050	<0.00050	<0.00050	<0.00050	0.00055	<0.00050	<0.00050	0.00103	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	0.0018	0.0015	0.0112	0.0019	0.0030	<0.0010	0.0019	0.0022	<0.0010	0.0018	0.0013	0.0031	0.0013	0.0030	0.0078	0.0016	-	<0.0010	0.0067	0.0044	0.0020	0.0024	<0.0010
Zirconium (Zr)-Dissolved	mg/L	-	0.00120	0.00098	0.00053	0.00087	0.00076	0.00102	0.00067	0.00162	0.00080	0.00068	0.00071	0.00059	0.00046	0.00071	0.00085	0.00073	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

Table 3.1: Analytical Chemistry Data

		Site Type	Reference Sites									Exposure Sites									Groundwater Seepage Sites				
		Site Location	Clinton Creek	Easter Creek	Wolverine Creek	Eagle Creek	Forty-Mile River	Porcupine Creek	Unnamed Creek	Unnamed Creek	Unnamed Creek	Clinton Creek	Clinton Creek	Clinton Creek	Wolverine Creek	Clinton Creek	Clinton Creek	Forty-Mile River	Porcupine Creek	Snowshoe Pit	Waste Rock Seepage				Abandoned Channel
		Sample ID	R1	R2	R3	R4*	R6*	R7	R8	R9	R11	E1*	E1(H)*	E2*	E3	E4*	E7*	E8*	E9	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5*
		Date Sampled	23/07/2016	23/07/2016	19/07/2016	21/07/2016	22/07/2016	20/07/2016	23/07/2016	23/07/2016	19/07/2016	22/07/2016	22/07/2016	21/07/2016	20/07/2016	21/07/2016	22/07/2016	22/07/2016	24/07/2016	24/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016	22/07/2016
		ALS Work Order	L1803696	L1803696	L1802392	L1803696	L1803696	L1802392	L1803696	L1803696	L1802392	L1803696	L1803696	L1803696	L1802392	L1803696	L1803696	L1803696		L1803696	L1802392	L1802392	L1802392	L1802392	L1803696
Parameter	Units	CCME-FAL[1, 2, 3, 4]	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Dry	Good	Good	Good	Good	Good	Good
Total Metals																									
Aluminum (Al)-Total	mg/L	Varies [8]	5.07	4.60	3.08	1.55	2.54	1.93	0.191	8.54	0.112	0.0761	0.0530	0.0313	0.402	0.0459	2.71	2.58	-	0.0439	0.157	<0.0030	<0.0030	0.0032	0.0046
Aluminum CCME-FAL	*mg/L*	-	*0.1000*	*0.1000*	*0.1000*	*0.10000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.100*	*0.1000*	*0.100*	*0.1000*	*0.10000*	*0.1000*	*0.1000*	-	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*
Antimony (Sb)-Total	mg/L	-	0.00069	0.00053	0.00041	0.00047	0.00018	0.00031	0.00109	0.00058	0.00020	0.00034	0.00031	0.00042	0.00104	0.00048	0.00057	0.00022	-	0.00284	0.00137	0.00127	0.00109	0.00123	0.00076
Arsenic (As)-Total	mg/L	0.005	0.00547	0.00415	0.00347	0.00410	0.00201	0.00268	0.00063	0.00662	0.00061	0.00094	0.00080	0.00119	0.00159	0.00120	0.00442	0.00203	-	0.0151	0.00213	0.00145	0.00094	0.00125	0.00082
Barium (Ba)-Total	mg/L	-	0.162	0.170	0.172	0.116	0.0774	0.163	0.0582	0.283	0.0661	0.0592	0.0587	0.0541	0.0771	0.0523	0.127	0.0804	-	0.0289	0.0185	0.0205	0.0356	0.0368	0.0516
Beryllium (Be)-Total	mg/L	-	0.000167	0.000152	0.000117	0.000054	0.000100	0.000091	<0.000020	0.000280	<0.000020	<0.000020	<0.000020	<0.000020	0.000023	<0.000020	0.000096	0.000097	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	0.000074	0.000051	<0.000050	0.000053	<0.000050	<0.000050	<0.000050	0.000097	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.031	0.088	0.045	0.034	<0.010	-	0.044	0.301	0.132	0.078	0.063	0.031
Cadmium (Cd)-Total	mg/L	Varies [9]	0.000403	0.000118	0.000132	0.000190	0.0000799	0.0000708	0.0000438	0.000342	0.0000348	0.0000450	0.0000437	0.0000497	0.0000222	0.0000419	0.000178	0.0000814	-	0.0000270	0.000191	0.000158	0.0000693	0.0000532	0.000107
Cadmium CCME-FAL	*mg/L*	-	*0.000304*	*0.000311*	*0.00037*	*0.00037*	*0.0001244*	*0.000222*	*0.000202*	*0.000191*	*0.000313*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001317*	-	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Total	mg/L	-	56.0	40.2	83.8	83.2	20.9	34.4	32.3	37.6	55.1	63.7	64.6	77.5	80.5	78.0	74.5	21.4	-	227	191	153	106	86.6	126
Chromium (Cr)-Total	mg/L	-	0.0139	0.0110	0.00666	0.00398	0.00505	0.00490	0.00155	0.0194	0.00078	0.00117	0.00049	0.00056	0.00183	0.00066	0.00779	0.00495	-	0.00221	0.00283	0.00108	0.00051	0.00055	0.00068
Trivalent Chromium (III)-Total	mg/L	0.0089	0.0139	0.00993	0.00666	0.00398	0.00505	0.00490	0.00155	0.0183	-	0.00117			<0.00074		0.00779	0.00495	-	<0.00076	<0.00088	<0.00072	-	-	-
Hexavalent Chromium (VI)-Total	mg/L	0.001	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	-	<0.0010			0.0012		<0.0010	<0.0010	-	0.0018	0.0034	0.0017	-	-	-
Cobalt (Co)-Total	mg/L	-	0.00483	0.00339	0.00261	0.00204	0.00196	0.00214	0.00020	0.00735	0.00017	0.00041	0.00043	0.00054	0.00045	0.00051	0.00315	0.00190	-	0.00019	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	Varies [10]	0.0161	0.00914	0.00942	0.00625	0.00748	0.00782	0.00365	0.0247	0.00228	0.00295	0.00295	0.00360	0.00242	0.00213	0.00960	0.0104	-	0.00120	0.00120	0.00138	0.00131	0.00132	0.00086
Copper CCME-FAL	*mg/L*	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	*0.00334*	*0.00304*	*0.00286*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*
Iron (Fe)-Total	mg/L	0.3	9.02	7.13	5.98	2.64	3.78	4.38	0.334	14.1	0.280	0.255	0.228	0.247	0.905	0.285	4.79	3.47	-	0.084	<0.010	<0.010	<0.010	<0.010	0.053
Lead (Pb)-Total	mg/L	Varies [11]	0.00657	0.00305	0.00262	0.00135	0.00166	0.00134	0.000151	0.00593	0.000095	0.000131	0.000118	0.000071	0.000322	0.000085	0.00319	0.00148	-	0.000053	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	*mg/L*	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.002195*	*0.00533*	*0.00462*	*0.00423*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.002395*	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*
Lithium (Li)-Total	mg/L	-	0.0055	0.0069	0.0066	0.0047	0.0041	0.0015	<0.0010	0.0069	<0.0010	0.0028	0.0026	0.0067	0.0053	0.0094	0.0097	0.0039	-	0.0104	0.0774	0.0126	0.0080	0.0074	0.0097
Magnesium (Mg)-Total	mg/L	-	21.7	29.7	60.7	41.1	6.97	16.9	12.2	14.8	26.1	30.5	30.6	47.8	65.9	54.0	51.4	7.42	-	108	283	171	84.3	60.7	58.0
Manganese (Mn)-Total	mg/L	-	0.363	0.235	0.273	0.228	0.101	0.422	0.0182	0.480	0.0244	0.109	0.151	0.0996	0.105	0.100	0.367	0.0989	-	0.00465	0.00030	0.00015	0.00018	0.00080	0.00346
Mercury (Hg)-Total	mg/L	0.000026	0.000155	<0.000025	0.0000207	<0.000025	<0.000025	<0.000025	0.0000078	<0.000050	<0.000050	0.0000057	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000123	<0.000025	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.073	0.00198	0.000670	0.00164	0.00147	0.000450	0.000720	0.00106	0.00126	0.00102	0.00135	0.00133	0.00170	0.00150	0.00169	0.00164	0.000459	-	0.00202	0.00285	0.00312	0.00282	0.00261	0.00192
Nickel (Ni)-Total	mg/L	Varies [12]	0.0184	0.0109	0.0112	0.0238	0.00649	0.00724	0.00437	0.0216	0.00252	0.00627	0.00407	0.0135	0.00944	0.0146	0.0220	0.00679	-	0.0195	0.0711	0.0389	0.0317	0.0337	0.0191
Nickel CCME-FAL	*mg/L*	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.07657*	*0.130*	*0.119*	*0.113*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.08067*	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Phosphorus (P)-Total	mg/L	-	0.232	0.165	0.126	0.068	0.088	0.101	<0.050	0.436	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.136	0.069	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	1.14	0.87	1.21	0.78	1.04	0.36	<0.10	0.92	0.41	0.62	0.60	0.85	1.00	0.92	1.49	1.07	-	1.47	3.21	1.91	1.35	1.21	0.77
Selenium (Se)-Total	mg/L	0.001	0.00204	0.000553	0.000693	0.00180	0.000253	0.000447	0.000800	0.00119	0.000631	0.00169	0.00170	0.00162	0.000838	0.00134	0.00135	0.000231	-	0.0160	0.00409	0.00324	0.00144	0.000898	0.00742
Silicon (Si)-Total	mg/L	-	11.6	12.4	11.2	7.45	8.72	8.32	5.89	17.8	6.21	4.11	4.18	4.46	6.64	4.54	8.67	8.72	-	3.72	6.19	5.30	5.50	6.07	4.45
Silver (Ag)-Total	mg/L	0.00025	0.000171	0.000045	0.000060	0.000058	0.000035	0.000025	0.000012	0.000129	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	0.000065	0.000031	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	2.28	2.52	4.57	5.03	2.77	2.09	4.19	2.18	6.29	2.83	2.73	3.50	5.35	4.31	4.06	2.99	-	2.65	17.5	5.78	3.72	3.30	3.94
Strontium (Sr)-Total	mg/L	-	0.235	0.213	0.416	0.451	0.114	0.107	0.125	0.144	0.261	0.291	0.295	0.412	0.410	0.451	0.416	0.115	-	0.988	1.87	0.814	0.541	0.452	0.717
Sulfur (S)-Total			39.5	35.1	101	65.5	8.85	25.6	26.8	20.9	48.1	53.9	54.6	81	98.200	85.3	77.8	9.6	-	256	459	291	138	96.4	111
Thallium (Tl)-Total	mg/L	0.0008	0.000076	0.000044	0.000044	0.000030	0.000028	0.000017	<0.000010	0.000062	<0.000010	0.000013	<0.000010	0.000024	<0.000010	0.000018	0.000048	0.000028	-	0.000016	0.000086	0.000065	0.000073	0.000073	0.000016
Tin (Sn)-Total	mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	0.115	0.111	0.0776	0.0374	0.0870	0.0585	0.00454	0.244	0.00284	0.00215	0.00160	0.00063	0.0125	0.00147	0.0770	0.0890	-	0.00103	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	0.00157	0.00243	0.00579	0.00466	0.000854	0.000257	0.000086	0.00104	0.00134	0.00192	0.00198	0.00211	0.00410	0.00229	0.00246	0.000827	-	0.00339	0.00641	0.00257	0.00146	0.00110	0.00247
Vanadium (V)-Total	mg/L	-	0.0145	0.0141	0.0102	0.00508	0.00782	0.00712	0.00103	0.0274	0.00085	0.00074	0.00070	<0.00050	0.00196	0.00051	0.00828	0.00767	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.0413	0.0201	0.0219	0.0130	0.0153	0.0122	0.0041	0.0476	<0.0030	<0.0030	<0.0030	<0.0030	0.0034	<0.0030	0.0322	0.0186	-	<0.0030	0.0070	0.0049	<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	0.00134	0.00099	0.00106	0.00095	0.00073	0.00095	0.00067	0.00209	0.00075	0.00077	0.00079	0.00063	0.00069	0.00073	0.00088	0.00071	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

Table 3.2: Analytical Quality Assurance and Control

		Site Location	GWCC-3 (Dup1)			GWCC-5 (Dup2)			Field Blanks	Travel Blanks	
		Sample ID	GWCC-3 (Dup1)	GWCC-3	RPD (%)[13]	GWCC-5 (Dup2)	GWCC-5	RPD (%)[13]	E3 (FB-1)	TRAVEL_BLANK	TRAVEL_BLANK
		Date Sampled	20/07/2016	20/07/2016		22/07/2016	22/07/2016		20/07/2016	20/07/2016	24/07/2016
		ALS Work Order	L1802392	L1802392		L1803696	L1803696		L1802392	L1802392	L1803696
Parameter	Units	CCME-FAL[1, 2, 3, 4]	Good	Good		Good	Good				
Physical Tests											
Lab pH	pH units	6.5-9.0[5]	7.69	7.73	0.52	7.99	7.98	0.13	5.85	5.36	5.42
Field pH	pH units	6.5-9.0[5]	7.48	7.48	-	7.51	7.51	-	-	-	-
Field Temperature	C	-	10.9	10.9	-	9.1	9.1	-	-	-	-
Lab Conductivity	uS/cm	-	1040	1030	0.97	963	962	0.10	<2.0	<2.0	<2.0
Field Conductivity	uS/cm	-	690	690	-	651	651	-	-	-	-
Field Specific Conductivity	uS/cm	-	946	946	-	935	935	-	-	-	-
Field Dissolved Oxygen	mg/L	9.5[6]	4.23	4.23	-	3.94	3.94	-	-	-	-
Field Oxidation - Redox Potent	mV	-	158.9	158.9	-	109.4	109.4	-	-	-	-
Total Suspended Solids	mg/L	-	-	-	nc	-	-	nc	-	-	-
Total Hardness (as CaCO3)	mg/L	-	613	612	0.16	556	562	1.07	<0.50	-	<0.50
Anions and Nutrients											
Nitrate (as N)	mg/L	13	0.171	0.17	0.59	<0.0050	0.0053	nc	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	<0.0020	<0.0020	nc	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010
Ammonia, Total (as N)	mg/L	Varies[7]	<0.0050	<0.0050	nc	<0.0050	<0.0050	nc	<0.0050	**0.0072**	**0.015**
Ammonia CCME-FAL	*mg/L*	-	3.179	3.179	-	3.415	3.415	-			
Sulfate (SO4)	mg/L	-	381	388	1.82	310	310	0.00	<0.30	<0.30	<0.30
Inorganic/Organic Carbon											
Dissolved Organic Carbon	mg/L	-	8.99	8.95	0.45	7.1	7.16	0.84	<0.50	-	-
Dissolved Metals											
Aluminum (Al)-Dissolved	mg/L	Varies[8]	0.0014	0.0015	6.90	0.0019	0.0015	nc	<0.0010	-	-
Aluminum CCME-FAL	*mg/L*	-	0.1	0.1	-	0.1	0.1	-	-	-	-
Antimony (Sb)-Dissolved	mg/L	-	0.00106	0.00106	0.00	0.00074	0.00076	2.67	<0.00010	-	-
Arsenic (As)-Dissolved	mg/L	0.005	0.00088	0.00091	3.35	0.00072	0.00069	4.26	<0.00010	-	-
Barium (Ba)-Dissolved	mg/L	-	0.0349	0.0349	0.00	0.0561	0.0536	4.56	<0.000050	-	-
Beryllium (Be)-Dissolved	mg/L	-	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	-	-
Bismuth (Bi)-Dissolved	mg/L	-	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	-	-
Boron (B)-Dissolved	mg/L	1.5	0.074	0.073	1.36	0.03	0.03	0.00	<0.010	-	-
Cadmium (Cd)-Dissolved	mg/L	Varies[9]	0.0000751	0.0000754	0.40	0.000115	0.000109	5.36	<0.0000050	-	-
Cadmium CCME-FAL	*mg/L*	-	0.00037	0.00037	-	0.00037	0.00037	-	-	-	-
Calcium (Ca)-Dissolved	mg/L	-	104	105	0.96	124	126	1.60	<0.050	-	-
Chromium (Cr)-Dissolved	mg/L	-	0.00045	0.00043	4.55	0.00064	0.00062	3.17	<0.00010	-	-
Trivalent Chromium (III)-Dissolved	mg/L	0.0089	-	-	-	-	-	nc	-	-	-
Hexavalent Chromium (VI)-Dissolved	mg/L	0.001	-	-	-	-	-	nc	-	-	-
Cobalt (Co)-Dissolved	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	-	-
Copper (Cu)-Dissolved	mg/L	Varies[10]	0.0011	0.00114	3.57	0.00079	0.00078	1.27	<0.00020	-	-
Copper CCME-FAL	*mg/L*	-	0.004	0.004	-	0.004	0.004	-	-	-	-
Iron (Fe)-Dissolved	mg/L	0.3	<0.010	<0.010	nc	0.039	0.038	2.60	<0.010	-	-
Lead (Pb)-Dissolved	mg/L	Varies[11]	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	-	-
Lead CCME-FAL	*mg/L*	-	0.007	0.007	-	0.007	0.007	-	-	-	-
Lithium (Li)-Dissolved	mg/L	-	0.0081	0.0079	2.50	0.0098	0.0096	2.06	<0.0010	-	-
Magnesium (Mg)-Dissolved	mg/L	-	85.6	85.2	0.47	59.7	59.9	0.33	<0.10	-	-
Manganese (Mn)-Dissolved	mg/L	-	0.00011	0.00012	8.70	0.00312	0.00316	1.27	<0.00010	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	<0.0000050	<0.0000050	nc	<0.0000050	<0.0000050	nc	<0.0000050	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	0.00244	0.00241	1.24	0.00168	0.00167	0.60	<0.000050	-	-
Nickel (Ni)-Dissolved	mg/L	Varies[12]	0.0306	0.0305	0.33	0.0194	0.0193	0.52	<0.00050	-	-
Nickel CCME-FAL	*mg/L*	-	0.15	0.15	-	0.15	0.15	-	-	-	-
Phosphorus (P)-Dissolved	mg/L	-	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	-	-
Potassium (K)-Dissolved	mg/L	-	1.32	1.29	2.30	0.75	0.79	5.19	<0.10	-	-
Selenium (Se)-Dissolved	mg/L	0.001	0.00154	0.00165	6.90	0.00731	0.00769	5.07	<0.000050	-	-
Silicon (Si)-Dissolved	mg/L	-	5.4	5.37	0.56	4.4	4.52	2.69	<0.050	-	-
Silver (Ag)-Dissolved	mg/L	0.00025	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	-	-
Sodium (Na)-Dissolved	mg/L	-	3.64	3.62	0.55	4.05	4.02	0.74	<0.050	-	-
Strontium (Sr)-Dissolved	mg/L	-	0.527	0.524	0.57	0.699	0.697	0.29	<0.00020	-	-
Sulfur (S)-Dissolved	mg/L	-	131	131	0.00	104	105	0.96	<0.50	-	-
Thallium (Tl)-Dissolved	mg/L	0.0008	0.00006	0.000059	1.68	0.000015	0.000016	6.45	<0.000010	-	-
Tin (Sn)-Dissolved	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	-	-
Titanium (Ti)-Dissolved	mg/L	-	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc	<0.00030	-	-
Uranium (U)-Dissolved	mg/L	0.015	0.00135	0.00134	0.74	0.00228	0.0023	0.87	<0.000010	-	-
Vanadium (V)-Dissolved	mg/L	-	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc	<0.00050	-	-
Zinc (Zn)-Dissolved	mg/L	0.03	0.0021	0.002	4.88	<0.0010	<0.0010	nc	<0.0010	-	-
Zirconium (Zr)-Dissolved	mg/L	-	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc	<0.00030	-	-

Table 3.2: Analytical Quality Assurance and Control

		Site Location	GWCC-3 (Dup1)			GWCC-5 (Dup2)			Field Blanks	Travel Blanks	
		Sample ID	GWCC-3 (Dup1)	GWCC-3	RPD (%)[13]	GWCC-5 (Dup2)	GWCC-5	RPD (%)[13]	E3 (FB-1)	TRAVEL_BLANK	TRAVEL_BLANK
		Date Sampled	20/07/2016	20/07/2016		22/07/2016	22/07/2016		20/07/2016	20/07/2016	24/07/2016
		ALS Work Order	L1802392	L1802392		L1803696	L1803696		L1802392	L1802392	L1803696
Parameter	Units	CCME-FAL[1, 2, 3, 4]	Good	Good		Good	Good				
Total Metals											
Aluminum (Al)-Total	mg/L	Varies [8]	<0.0030	<0.0030	nc	<0.0030	0.0046	nc	<0.0030	<0.0030	<0.0030
Aluminum CCME-FAL	*mg/L*	-	0.1	0.1	-	0.1	0.1	-	-	-	-
Antimony (Sb)-Total	mg/L	-	0.00108	0.00109	0.92	0.00076	0.00076	0.00	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	0.00094	0.00094	0.00	0.00076	0.00082	7.59	<0.00010	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	0.0355	0.0356	0.28	0.0533	0.0516	3.24	<0.000050	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	-	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	1.5	0.078	0.078	0.00	0.032	0.031	3.17	<0.010	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	Varies [9]	0.0000797	0.0000693	13.96	0.00011	0.000107	2.76	<0.0000050	<0.0000050	<0.0000050
Cadmium CCME-FAL	*mg/L*	-	0.00037	0.00037	-	0.00037	0.00037	-	-	-	-
Calcium (Ca)-Total	mg/L	-	107	106	0.94	127	126	0.79	<0.050	<0.050	<0.050
Chromium (Cr)-Total	mg/L	-	0.00048	0.00051	6.06	0.0007	0.00068	2.90	<0.00010	<0.00010	<0.00010
Trivalent Chromium (III)-Total	mg/L	0.0089	-	-	-	-	-	-	-	-	-
Hexavalent Chromium (VI)-Total	mg/L	0.001	-	-	-	-	-	-	-	-	-
Cobalt (Co)-Total	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	Varies [10]	0.00141	0.00131	7.35	0.00088	0.00086	2.30	<0.00050	<0.00050	<0.00050
Copper CCME-FAL	*mg/L*	-	0.004	0.004	-	0.004	0.004	-	-	-	-
Iron (Fe)-Total	mg/L	0.3	<0.010	<0.010	nc	0.052	0.053	1.90	<0.010	<0.010	<0.010
Lead (Pb)-Total	mg/L	Varies [11]	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	*mg/L*	-	0.007	0.007	-	0.007	0.007	-	-	-	-
Lithium (Li)-Total	mg/L	-	0.0081	0.008	1.24	0.0097	0.0097	0.00	<0.0010	<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	-	84.9	84.3	0.71	58.3	58	0.52	<0.10	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	0.00017	0.00018	5.71	0.00341	0.00346	1.46	**0.00011**	<0.00010	<0.00010
Mercury (Hg)-Total	mg/L	0.000026	<0.0000050	<0.0000050	nc	<0.0000050	<0.0000050	nc	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.073	0.00281	0.00282	0.36	0.00192	0.00192	0.00	<0.000050	<0.000050	<0.000050
Nickel (Ni)-Total	mg/L	Varies [12]	0.0315	0.0317	0.63	0.0195	0.0191	2.07	<0.00050	<0.00050	<0.00050
Nickel CCME-FAL	*mg/L*	-	0.15	0.15	-	0.15	0.15	-	-	-	-
Phosphorus (P)-Total	mg/L	-	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	1.39	1.35	2.92	0.77	0.77	0.00	<0.10	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	0.00147	0.00144	2.06	0.00738	0.00742	0.54	<0.000050	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	5.55	5.5	0.90	4.47	4.45	0.45	<0.050	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.00025	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	3.73	3.72	0.27	3.99	3.94	1.26	<0.050	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	0.535	0.541	1.12	0.703	0.717	1.97	<0.00020	<0.00020	<0.00020
Sulfur (S)-Total	mg/L	-	142	138	2.86	111	111	0.00	<0.50	<0.50	<0.50
Thallium (Tl)-Total	mg/L	0.0008	0.000081	0.000073	10.39	0.000015	0.000016	6.45	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc	<0.00030	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	0.00145	0.00146	0.69	0.00239	0.00247	3.29	<0.000010	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.003	<0.0030	nc	<0.0030	<0.0030	nc	<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	<0.00030	<0.00030	nc	<0.00030	<0.00030	nc	<0.00030	<0.00030	<0.00030

Notes

(1) CCME guideline exceedences shaded with dark grey. Light grey shading denotes reportable detection limit in exceedence of CCME Guideline. Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) - = No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to July 2016

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to July 2016

(5) CCME FAL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N,and other usage guidelines. CCME values listed in the table are expressed as ammonia (N) When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(8) Aluminum varies with pH as follows for CCME FAL:

0.005 if pH<6.5

0.1 if pH>=6.5

when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL:

0.00 if H<17

0.00004 - 0.00037 if H>=17 and H<=280 as follows;

CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46 }

0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL:

0.002 if H<82

0.002 - 0.004 if H>=82 and H<=180 as follows;

CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}

0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL:

0.001 if H<60

.001 - 0.00 if H>=60 and H<=180 as follows;

CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}

0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL:

0.025 if H<60

025 - 0.15 if H>=60 and H<=180 as follows;

CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}

0.15 if H>180

(13) RPD = Relative Percent Difference. The difference between a sample and its field duplicate over the average of two values.
nc = not calculated. RPD is not calculated if either the sample or the field duplicate concentration is less than five times the detection limit.

Italics text indicates the parameter-specific standard (calculated) for a particular sample.

Bold and underlined indicates values above RDL in Field Blank of Travel Blank

Bold and Italic Indicates QAQC values exceed expected results (i.e. RDP values exceed 20%).

* Due to laboratory holding time constraints, samples for general chemistry analysis (i.e. lab pH, lab conductivity, nitrate, nitrite, and sulphate) were collected at a different time/date than the remainder of the sample set. Sample date/time for general chemistry data with this type of discrepancy are listed below:

E1 - July 24, 2016 at 11:50

E1(H) - July 24, 2016 at 11:10

E2 - July 24, 2016 at 12:10

E4 - July 24, 2016 at 12:40

E7 - July 24, 2016 at 13:10

E8 - July 24, 2016 at 13:00

R4 - July 24, 2016 at 12:45

R6 - July 24, 2016 at 13:30

GWCC-5 - July 24 2016 at 12:00

APPENDIX 1

Laboratory Certificates of Analysis

HEMMERA ENVIROCHEM INC.
ATTN: Natasha Sandys
230 - 2237 2nd Avenue
Whitehorse YK Y1A 0K7

Date Received: 22-JUL-16
Report Date: 16-AUG-16 17:05 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1802392

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.18
C of C Numbers: 1
Legal Site Desc:

Comments: ADDITIONAL 12-AUG-16 12:32

16-AUG-2016 Revision 2: This revision includes additional chromium speciation analysis.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1802392-1 Water 20-JUL-16 08:05 E3	L1802392-2 Water 19-JUL-16 16:50 R3	L1802392-3 Water 20-JUL-16 13:20 R7	L1802392-4 Water 19-JUL-16 14:30 R11	L1802392-5 Water 20-JUL-16 17:15 GWCC-1
WATER						
Physical Tests	Conductivity (uS/cm)	823	816	293	484	2420
	Hardness (as CaCO3) (mg/L)	484	470	150	227	1680
	pH (pH)	8.20	8.12	7.55	8.01	7.63
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0095	0.0397	0.0794	<0.0050	<0.0050
	Nitrate (as N) (mg/L)	0.189	0.0523	0.0980	0.0904	0.521
	Nitrite (as N) (mg/L)	0.0047	0.0023	<0.0010	<0.0010	<0.0050 DLDS
	Phosphorus (P)-Total (mg/L)	0.0074	0.0596	0.0486	0.0055	<0.0020
	Sulfate (SO4) (mg/L)	265	274	70.9	131	1270
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	12.5	13.4	27.3	14.1	5.33
	Total Organic Carbon (mg/L)					
Total Metals	Aluminum (Al)-Total (mg/L)	0.402	3.08	1.93	0.112	0.157
	Antimony (Sb)-Total (mg/L)	0.00104	0.00041	0.00031	0.00020	0.00137
	Arsenic (As)-Total (mg/L)	0.00159	0.00347	0.00268	0.00061	0.00213
	Barium (Ba)-Total (mg/L)	0.0771	0.172	0.163	0.0661	0.0185
	Beryllium (Be)-Total (mg/L)	0.000023	0.000117	0.000091	<0.000020	<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.088	<0.010	<0.010	<0.010	0.301
	Cadmium (Cd)-Total (mg/L)	0.0000222	0.000132	0.0000708	0.0000348	0.000191
	Calcium (Ca)-Total (mg/L)	80.5	83.8	34.4	55.1	191
	Chromium (Cr)-Total (mg/L)	0.00183	0.00666	0.00490	0.00078	0.00283
	Cobalt (Co)-Total (mg/L)	0.00045	0.00261	0.00214	0.00017	<0.00010
	Copper (Cu)-Total (mg/L)	0.00242	0.00942	0.00782	0.00228	0.00120
	Iron (Fe)-Total (mg/L)	0.905	5.98	4.38	0.280	<0.010
	Lead (Pb)-Total (mg/L)	0.000322	0.00262	0.00134	0.000095	<0.000050
	Lithium (Li)-Total (mg/L)	0.0053	0.0066	0.0015	<0.0010	0.0774
	Magnesium (Mg)-Total (mg/L)	65.9	60.7	16.9	26.1	283
	Manganese (Mn)-Total (mg/L)	0.105	0.273	0.422	0.0244	0.00030
	Mercury (Hg)-Total (mg/L)	<0.0000050	0.0000207	<0.000025 DLM	<0.0000050	<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.00150	0.00164	0.000720	0.00102	0.00285
	Nickel (Ni)-Total (mg/L)	0.00944	0.0112	0.00724	0.00252	0.0711
	Phosphorus (P)-Total (mg/L)	<0.050	0.126	0.101	<0.050	<0.050
	Potassium (K)-Total (mg/L)	1.00	1.21	0.36	0.41	3.21
	Selenium (Se)-Total (mg/L)	0.000838	0.000693	0.000447	0.000631	0.00409
	Silicon (Si)-Total (mg/L)	6.64	11.2	8.32	6.21	6.19
	Silver (Ag)-Total (mg/L)	0.000010	0.000060	0.000025	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	5.35	4.57	2.09	6.29	17.5

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1802392-6	L1802392-7	L1802392-8	L1802392-9	L1802392-10
Description	Water	Water	Water	Water	Water
Sampled Date	20-JUL-16	20-JUL-16	20-JUL-16		20-JUL-16
Sampled Time	16:50	16:15	17:45		16:15
Client ID	GWCC-2	GWCC-3	GWCC-4	TRAVEL BLANK	DUP1
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	1680	1030	822	<2.0	1040
Hardness (as CaCO3) (mg/L)	1110	612	471		613
pH (pH)	7.80	7.73	7.69	5.36 RRV	7.69
Anions and Nutrients Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0072	<0.0050
Nitrate (as N) (mg/L)	0.356	0.170	0.0861	<0.0050	0.171
Nitrite (as N) (mg/L)	<0.0050 DLDS	<0.0020 DLDS	<0.0010	<0.0010	<0.0020 DLDS
Phosphorus (P)-Total (mg/L)	0.0021	<0.0020	<0.0020	<0.0020	0.0028
Sulfate (SO4) (mg/L)	790	388	257	<0.30	381
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	7.04	8.95	9.53		8.99
Total Organic Carbon (mg/L)				<0.50	
Total Metals Aluminum (Al)-Total (mg/L)	<0.0030	<0.0030	0.0032	<0.0030	<0.0030
Antimony (Sb)-Total (mg/L)	0.00127	0.00109	0.00123	<0.00010	0.00108
Arsenic (As)-Total (mg/L)	0.00145	0.00094	0.00125	<0.00010	0.00094
Barium (Ba)-Total (mg/L)	0.0205	0.0356	0.0368	<0.000050	0.0355
Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	0.132	0.078	0.063	<0.010	0.078
Cadmium (Cd)-Total (mg/L)	0.000158	0.0000693	0.0000532	<0.0000050	0.0000797
Calcium (Ca)-Total (mg/L)	153	106	86.6	<0.050	107
Chromium (Cr)-Total (mg/L)	0.00108	0.00051	0.00055	<0.00010	0.00048
Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total (mg/L)	0.00138	0.00131	0.00132	<0.00050	0.00141
Iron (Fe)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Total (mg/L)	0.0126	0.0080	0.0074	<0.0010	0.0081
Magnesium (Mg)-Total (mg/L)	171	84.3	60.7	<0.10	84.9
Manganese (Mn)-Total (mg/L)	0.00015	0.00018	0.00080	<0.00010	0.00017
Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.00312	0.00282	0.00261	<0.000050	0.00281
Nickel (Ni)-Total (mg/L)	0.0389	0.0317	0.0337	<0.00050	0.0315
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	1.91	1.35	1.21	<0.10	1.39
Selenium (Se)-Total (mg/L)	0.00324	0.00144	0.000898	<0.000050	0.00147
Silicon (Si)-Total (mg/L)	5.30	5.50	6.07	<0.050	5.55
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	5.78	3.72	3.30	<0.050	3.73

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1802392-11				
	Description	Water				
	Sampled Date	20-JUL-16				
	Sampled Time	08:05				
	Client ID	FB-1				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.85				
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	<0.0050				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Phosphorus (P)-Total (mg/L)	<0.020 DLM				
	Sulfate (SO4) (mg/L)	<0.30				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50				
	Total Organic Carbon (mg/L)					
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	<0.000050				
	Beryllium (Be)-Total (mg/L)	<0.000020				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	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)	<0.0010				
	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	0.00011				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	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)	<0.000050				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	<0.050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1802392-1	L1802392-2	L1802392-3	L1802392-4	L1802392-5
Description	Water	Water	Water	Water	Water
Sampled Date	20-JUL-16	19-JUL-16	20-JUL-16	19-JUL-16	20-JUL-16
Sampled Time	08:05	16:50	13:20	14:30	17:15
Client ID	E3	R3	R7	R11	GWCC-1
Grouping / **Analyte**					
WATER					
Total Metals Strontium (Sr)-Total (mg/L)	0.410	0.416	0.107	0.261	1.87
Sulfur (S)-Total (mg/L)	98.2	101	25.6	48.1	459
Thallium (Tl)-Total (mg/L)	<0.000010	0.000044	0.000017	<0.000010	0.000086
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.0125	0.0776	0.0585	0.00284	<0.00030
Uranium (U)-Total (mg/L)	0.00410	0.00579	0.000257	0.00134	0.00641
Vanadium (V)-Total (mg/L)	0.00196	0.0102	0.00712	0.00085	<0.00050
Zinc (Zn)-Total (mg/L)	0.0034	0.0219	0.0122	<0.0030	0.0070
Zirconium (Zr)-Total (mg/L)	0.00069	0.00106	0.00095	0.00075	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved (mg/L)	0.0166	0.0218	0.0760	0.0260	0.0010
Antimony (Sb)-Dissolved (mg/L)	0.00097	0.00018	0.00021	0.00018	0.00133
Arsenic (As)-Dissolved (mg/L)	0.00117	0.00076	0.00154	0.00057	0.00209
Barium (Ba)-Dissolved (mg/L)	0.0639	0.0594	0.115	0.0619	0.0183
Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	0.000025	<0.000020	<0.000020
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)	0.083	<0.010	<0.010	<0.010	0.278
Cadmium (Cd)-Dissolved (mg/L)	0.0000112	0.0000094	0.0000164	0.0000159	0.000187
Calcium (Ca)-Dissolved (mg/L)	77.4	83.0	33.5	51.1	194
Chromium (Cr)-Dissolved (mg/L)	0.00061	0.00040	0.00116	0.00057	0.00257
Cobalt (Co)-Dissolved (mg/L)	0.00025	0.00041	0.00082	0.00011	<0.00010
Copper (Cu)-Dissolved (mg/L)	0.00156	0.00167	0.00370	0.00182	0.00095
Iron (Fe)-Dissolved (mg/L)	0.121	0.210	1.47	0.127	<0.010
Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000060	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	0.0050	0.0037	<0.0010	<0.0010	0.0764
Magnesium (Mg)-Dissolved (mg/L)	70.7	63.7	16.2	24.2	291
Manganese (Mn)-Dissolved (mg/L)	0.0849	0.162	0.383	0.0181	0.00017
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved (mg/L)	0.00119	0.00117	0.000550	0.00104	0.00245
Nickel (Ni)-Dissolved (mg/L)	0.00805	0.00354	0.00378	0.00218	0.0695
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	0.86	0.80	0.22	0.35	3.34
Selenium (Se)-Dissolved (mg/L)	0.000978	0.000522	0.000297	0.000858 DTC	0.00451
Silicon (Si)-Dissolved (mg/L)	5.73	6.13	5.45	6.26	6.25
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	5.28	4.39	2.04	6.38	17.3

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1802392-6	L1802392-7	L1802392-8	L1802392-9	L1802392-10
Description	Water	Water	Water	Water	Water
Sampled Date	20-JUL-16	20-JUL-16	20-JUL-16		20-JUL-16
Sampled Time	16:50	16:15	17:45		16:15
Client ID	GWCC-2	GWCC-3	GWCC-4	TRAVEL BLANK	DUP1
Grouping / **Analyte**					
WATER					
Total Metals Strontium (Sr)-Total (mg/L)	0.814	0.541	0.452	<0.00020	0.535
Sulfur (S)-Total (mg/L)	291	138	96.4	<0.50	142
Thallium (Tl)-Total (mg/L)	0.000065	0.000073	0.000073	<0.000010	0.000081
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium (U)-Total (mg/L)	0.00257	0.00146	0.00110	<0.000010	0.00145
Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total (mg/L)	0.0049	<0.0030	<0.0030	<0.0030	0.0030
Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD		FIELD
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		FIELD
Aluminum (Al)-Dissolved (mg/L)	0.0011	0.0015	0.0014		0.0014
Antimony (Sb)-Dissolved (mg/L)	0.00125	0.00106	0.00119		0.00106
Arsenic (As)-Dissolved (mg/L)	0.00141	0.00091	0.00124		0.00088
Barium (Ba)-Dissolved (mg/L)	0.0207	0.0349	0.0365		0.0349
Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		<0.000020
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		<0.000050
Boron (B)-Dissolved (mg/L)	0.123	0.073	0.060		0.074
Cadmium (Cd)-Dissolved (mg/L)	0.000142	0.0000754	0.0000463		0.0000751
Calcium (Ca)-Dissolved (mg/L)	155	105	85.9		104
Chromium (Cr)-Dissolved (mg/L)	0.00098	0.00043	0.00042		0.00045
Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		<0.00010
Copper (Cu)-Dissolved (mg/L)	0.00115	0.00114	0.00121		0.00110
Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	<0.010		<0.010
Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		<0.000050
Lithium (Li)-Dissolved (mg/L)	0.0124	0.0079	0.0074		0.0081
Magnesium (Mg)-Dissolved (mg/L)	175	85.2	62.2		85.6
Manganese (Mn)-Dissolved (mg/L)	0.00013	0.00012	0.00057		0.00011
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050		<0.0000050
Molybdenum (Mo)-Dissolved (mg/L)	0.00266	0.00241	0.00217		0.00244
Nickel (Ni)-Dissolved (mg/L)	0.0376	0.0305	0.0322		0.0306
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050		<0.050
Potassium (K)-Dissolved (mg/L)	1.97	1.29	1.18		1.32
Selenium (Se)-Dissolved (mg/L)	0.00339	0.00165	0.000980		0.00154
Silicon (Si)-Dissolved (mg/L)	5.34	5.37	6.07		5.40
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		<0.000010
Sodium (Na)-Dissolved (mg/L)	5.60	3.62	3.20		3.64

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1802392-11				
	Description	Water				
	Sampled Date	20-JUL-16				
	Sampled Time	08:05				
	Client ID	FB-1				
Grouping	**Analyte**					
WATER						
Total Metals	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)	<0.00030				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.00030				
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	<0.0010				
	Antimony (Sb)-Dissolved (mg/L)	<0.00010				
	Arsenic (As)-Dissolved (mg/L)	<0.00010				
	Barium (Ba)-Dissolved (mg/L)	<0.000050				
	Beryllium (Be)-Dissolved (mg/L)	<0.000020				
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050				
	Boron (B)-Dissolved (mg/L)	<0.010				
	Cadmium (Cd)-Dissolved (mg/L)	<0.0000050				
	Calcium (Ca)-Dissolved (mg/L)	<0.050				
	Chromium (Cr)-Dissolved (mg/L)	<0.00010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00010				
	Copper (Cu)-Dissolved (mg/L)	<0.00020				
	Iron (Fe)-Dissolved (mg/L)	<0.010				
	Lead (Pb)-Dissolved (mg/L)	<0.000050				
	Lithium (Li)-Dissolved (mg/L)	<0.0010				
	Magnesium (Mg)-Dissolved (mg/L)	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	<0.00010				
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050				
	Nickel (Ni)-Dissolved (mg/L)	<0.00050				
	Phosphorus (P)-Dissolved (mg/L)	<0.050				
	Potassium (K)-Dissolved (mg/L)	<0.10				
	Selenium (Se)-Dissolved (mg/L)	<0.000050				
	Silicon (Si)-Dissolved (mg/L)	<0.050				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	<0.050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1802392-1	L1802392-2	L1802392-3	L1802392-4	L1802392-5
Description	Water	Water	Water	Water	Water
Sampled Date	20-JUL-16	19-JUL-16	20-JUL-16	19-JUL-16	20-JUL-16
Sampled Time	08:05	16:50	13:20	14:30	17:15
Client ID	E3	R3	R7	R11	GWCC-1
Grouping / **Analyte**					
WATER					
Dissolved Metals Strontium (Sr)-Dissolved (mg/L)	0.396	0.410	0.102	0.253	1.81
Sulfur (S)-Dissolved (mg/L)	96.2	99.8	24.9	41.4	438
Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000078
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	0.00053	0.00056	0.00214	0.00059	<0.00030
Uranium (U)-Dissolved (mg/L)	0.00369	0.00495	0.000117	0.00107	0.00613
Vanadium (V)-Dissolved (mg/L)	0.00055	0.00077	0.00125	<0.00050	<0.00050
Zinc (Zn)-Dissolved (mg/L)	0.0013	0.0112	<0.0010	<0.0010	0.0067
Zirconium (Zr)-Dissolved (mg/L)	0.00046	0.00053	0.00102	0.00080	<0.00030
Speciated Metals Chromium (III)-Dissolved (mg/L)			0.00116		<0.00058
Chromium (III)-Total (mg/L)	<0.00074	0.00666	0.00490		<0.00088
Hexavalent Chromium (mg/L)	0.0012	<0.0010	<0.0010		0.0034
Hexavalent Chromium-Dissolved (mg/L)			<0.0010		0.0034

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1802392-6 Water 20-JUL-16 16:50 GWCC-2	L1802392-7 Water 20-JUL-16 16:15 GWCC-3	L1802392-8 Water 20-JUL-16 17:45 GWCC-4	L1802392-9 Water TRAVEL BLANK	L1802392-10 Water 20-JUL-16 16:15 DUP1
WATER						
Dissolved Metals	Strontium (Sr)-Dissolved (mg/L)	0.802	0.524	0.432		0.527
	Sulfur (S)-Dissolved (mg/L)	272	131	91.5		131
	Thallium (Tl)-Dissolved (mg/L)	0.000053	0.000059	0.000073		0.000060
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00239	0.00134	0.000998		0.00135
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0044	0.0020	0.0024		0.0021
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)	<0.00072				
	Hexavalent Chromium (mg/L)	0.0017				
	Hexavalent Chromium-Dissolved (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1802392-11				
	Description	Water				
	Sampled Date	20-JUL-16				
	Sampled Time	08:05				
	Client ID	FB-1				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Strontium (Sr)-Dissolved (mg/L)	<0.00020				
	Sulfur (S)-Dissolved (mg/L)	<0.50				
	Thallium (Tl)-Dissolved (mg/L)	<0.000010				
	Tin (Sn)-Dissolved (mg/L)	<0.00010				
	Titanium (Ti)-Dissolved (mg/L)	<0.00030				
	Uranium (U)-Dissolved (mg/L)	<0.000010				
	Vanadium (V)-Dissolved (mg/L)	<0.00050				
	Zinc (Zn)-Dissolved (mg/L)	<0.0010				
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030				
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)					
	Hexavalent Chromium (mg/L)					
	Hexavalent Chromium-Dissolved (mg/L)					

* 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	Bismuth (Bi)-Dissolved	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Duplicate	Boron (B)-Dissolved	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Duplicate	Silver (Ag)-Dissolved	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Duplicate	Sodium (Na)-Dissolved	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Duplicate	Tin (Sn)-Dissolved	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Duplicate	Aluminum (Al)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Boron (B)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Copper (Cu)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lithium (Li)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Selenium (Se)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Thallium (Tl)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Vanadium (V)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Total	DLA	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Sulfate (SO4)	MB-LOR	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sulfate (SO4)	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Boron (B)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Calcium (Ca)-Total	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Total	MS-B	L1802392-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Reference Information

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
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**
BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-VA	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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

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

CR-CR3-DIS-CALC-ED	Water	Dissolved Trivalent Chromium in Water	CALCULATION

Chromium (III)-Dissolved is calculated as the difference between the dissolved chromium and the dissolved hexavalent chromium (Cr(VI)) results.

CR-CR3-TOT-CALC-ED	Water	Total Trivalent Chromium in Water	CALCULATION

Chromium (III)-Total is calculated as the difference between the total chromium and the hexavalent chromium (Cr(VI)) results.

CR-CR6-ED	Water	Chromium, Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on an un-filtered, field-preserved sample.

CR6-D-IC-ED	Water	Chromium, Dissolved Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on a field-filtered, field-preserved sample.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA	Water	Diss. Mercury in Water by CVAAS or CVAFS	APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

Reference Information

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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 APHA 4500 NH3-NITROGEN (AMMONIA)

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.

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.

NO2-L-IC-N-WR Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WR Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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.

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

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

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

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

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

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

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

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

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

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.

SO4-IC-N-WR Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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

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

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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Contact:
Company:
Address:

REFERENCE DATA

Project / Location:
PO Number:
ALS Work Order:

TEM Water Narrative: Analysis performed on FEI Tecnai TEM with integrated EDXA capabilities. Morphology, EDXA, and SAED measurements used to determine fiber species. Representative EDXA spectra of each asbestos type detected included. Compliance samples must be received and filtered within 48 hours of collection. Collection is performed outside ALS and is the responsibility of the client. Samples disposed after 60 days. TEM grids archived 3 years. Results apply only to portions analyzed.

TEM Water Methods: "EPA 100.2" refers to drinking water samples filtered on 47mm, 0.22µm pore MCE filters. "EPA 100.1" refers to drinking water samples filtered on 47mm, 0.1µm pore Polycarbonate filters. No standard method for asbestos in nonpotable water exists. All TEM waters (potable and nonpotable) analyzed at >10,000x magnification for asbestos fibers >10µm long. Whenever possible, sufficient volume is analyzed to yield an AS of <0.20 MFL based on the detection of 1 confirmed asbestos fiber in the total area analyzed. However, the volume analyzed is dependent upon a filter loading of <25% particulate. Samples containing excessive suspended solids may not reach the recommended AS of <0.20 MFL. In any case, a minimum of 4 and a maximum of 10 openings are analyzed regardless of the AS reached or asbestos concentration detected. ALS will report results directly to state of origin only when;

a) the Chain of Custody clearly states "drinking water for state compliance",
b) the appropriate state drinking water form is submitted with the samples,
c) the state form is completely filled out by the client prior to submittal, and
d) the address to which the form is to be sent is provided.

NOTES: *NA=Not Applicable, ND=None Detected, AS=Analytical Sensitivity, MFL=Millions of Fibers per Liter. † Act-Tremolite concentrations include Actinolite as well as the Libby Amphiboles; Tremolite, Winchite, & Richterite.*

OH Lab ID: #4077, Ohio Analysts; P. Johnson #2268, A. Sohn #3431

PA Lab ID: #68-01320, Cert. #003

NELAC accredited through New York ELAP, LAB #11371

TEM ANALYSIS DATA

EDXA Resolution (eV): <175
Accelerating Voltage (keV): 100
Prep Start Date: 7/27/2016
Calibration Constant (µm/cm): 0.74
Camera Constant (mm-Å): 129.25
Analysis Start Date: 7/28/2016

Pamela Johnson
ALS TEM Analyst

Shawn Smythe
ALS Project Manager

IDENTIFICATION

Client Sample ID:	L1802392-1 E3	L1802392-2 R3
ALS Sample ID:	1607739-01	1607739-02
Method:	EPA 100.2	EPA 100.2
Date of Collection:	7/20/2016	7/19/2016
Time of Collection:	10:00	10:00

FILTRATION & ANALYSIS

Date of Filtration:	7/26/2016	7/26/2016
Time of Filtration:	16:35	16:35
Volume Filtered (L):	0.005	0.001
Openings Analyzed:	4	10
Avg. Opening Area (mm^2):	0.011	0.011
AS (MFL):	4.89	9.77

ASBESTOS COUNT

Chrysotile:	9	0
Amosite:	0	0
Crocidolite:	0	0
Act-Tremolite†:	0	0
Anthophyllite:	0	0
Total Asbestos:	9	0

ASBESTOS CONCENTRATION (MFL)

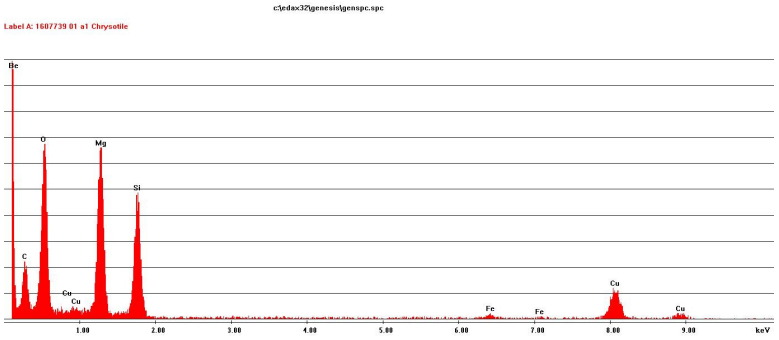
Chrysotile:	43.98	<AS
Amosite:	<AS	<AS
Crocidolite:	<AS	<AS
Act-Tremolite†:	<AS	<AS
Anthophyllite:	<AS	<AS
Total Asbestos:	**43.98**	**<AS**

NOTES

The extremely high concentration of suspended solids in sample L1802392-2 R3 prohibited filtration of sufficient volume to reach the recommended AS of <0.20 MFL.

EDXA SPECTRA

NOTE: Spurious peaks may originate from low background sample holder, column pole pieces, TEM grids, prep solutions or matrix materials.



PHOTOMICROGRAPHS

Collected using Gatan Digital Micrograph.

29-Jul-2016

Brent Mack
ALS Environmental
8081 Lougheed HWY
Suite 100
Burnaby, BC V5A1W9

Tel: (604) 253-4188
Fax:

Re: L1802392 Work Order: **1607739**

Dear Brent,

ALS Environmental received 11 samples on 26-Jul-2016 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 17.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Rob Nieman

Shawn Smythe
Project Manager

ALS Environmental

Date: 29-Jul-16

Client: ALS Environmental
Project: L1802392
Work Order: **1607739**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1607739-01	L1802392-1	Water		7/20/2016	7/26/2016 10:00	☐
1607739-02	L1802392-2	Water		7/19/2016	7/26/2016 10:00	☐
1607739-02	L1802392-2	Water		7/19/2016	7/26/2016 10:00	☐
1607739-03	L1802392-3	Water		7/20/2016	7/26/2016 10:00	☐
1607739-04	L1802392-4	Water		7/20/2016	7/26/2016 10:00	☐
1607739-05	L1802392-5	Water		7/20/2016	7/26/2016 10:00	☐
1607739-06	L1802392-6	Water		7/20/2016	7/26/2016 10:00	☐
1607739-07	L1802392-7	Water		7/20/2016	7/26/2016 10:00	☐
1607739-08	L1802392-8	Water		7/20/2016	7/26/2016 10:00	☐
1607739-09	L1802392-9	Water		7/20/2016	7/26/2016 10:00	☐
1607739-10	L1802392-10	Water		7/20/2016	7/26/2016 10:00	☐
1607739-11	L1802392-11	Water		7/20/2016	7/26/2016 10:00	☐

ALS Environmental

Date: 29-Jul-16

Client: ALS Environmental
Project: L1802392
Work Order: 1607739

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-1	**Lab ID:**	1607739-01
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**7.9**		**2.0**	**mg/L**	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-2	**Lab ID:**	1607739-02
Collection Date:	7/19/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**140**		**2.0**	**mg/L**	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-3	**Lab ID:**	1607739-03
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**78**		**2.0**	**mg/L**	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-4	**Lab ID:**	1607739-04
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**4.8**		**2.0**	**mg/L**	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-5	**Lab ID:**	1607739-05
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-6	**Lab ID:**	1607739-06
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-7	**Lab ID:**	1607739-07
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-8	**Lab ID:**	1607739-08
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-9	**Lab ID:**	1607739-09
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-10	**Lab ID:**	1607739-10
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**2.2**		**2.0**	**mg/L**	1	7/27/2016

Note:

ALS Environmental

Date: *29-Jul-16*

Client:	ALS Environmental		
Project:	L1802392	**Work Order:**	1607739
Sample ID:	L1802392-11	**Lab ID:**	1607739-11
Collection Date:	7/20/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.0	mg/L	1	7/27/2016

Note:

ALS Environmental

Date: 29-Jul-16

Client: ALS Environmental

Work Order: 1607739

Project: L1802392

QC BATCH REPORT

Batch ID: **R131436** Instrument ID: **WETCHEM** Method: **SM2540 D**

MBLK Sample ID: **MB-R131436-R131436** Units: **mg/L** Analysis Date: **7/27/2016**

Client ID: Run ID: **WETCHEM_160727A** SeqNo: **1327526** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	2.0								

LCS Sample ID: **LCS-R131436-R131436** Units: **mg/L** Analysis Date: **7/27/2016**

Client ID: Run ID: **WETCHEM_160727A** SeqNo: **1327527** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	1020	2.0	1000	0	102	70-130	0			

DUP Sample ID: **1607739-10A Dup** Units: **mg/L** Analysis Date: **7/27/2016**

Client ID: **L1802392-10** Run ID: **WETCHEM_160727A** SeqNo: **1327538** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	2.0	0	0	0		2.24	0		

DUP Sample ID: **1607739-11A Dup** Units: **mg/L** Analysis Date: **7/27/2016**

Client ID: **L1802392-11** Run ID: **WETCHEM_160727A** SeqNo: **1327540** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	2.0	0	0	0		1.38	0		

The following samples were analyzed in this batch:

1607739-01B	1607739-02B	1607739-03A
1607739-04A	1607739-05A	1607739-06A
1607739-07A	1607739-08A	1607739-09A
1607739-10A	1607739-11A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 29-Jul-16

Client: ALS Environmental
Project: L1802392
WorkOrder: **1607739**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
%	
mg/L	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-VANCOUVER** Date/Time Received: **26-Jul-16 10:00**

Work Order: **1607739** Received by: **CEG**

Checklist completed by: Shawn Smythe 27-Jul-16 Reviewed by: Shawn Smythe 27-Jul-16

eSignature | Date | eSignature | Date

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:	-		

Login Notes: Samples not relinquished.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1802392-COFC

COC Number: 1

Page 1 of 1

Report To		Report Format	
Company:	Hemmera Environchem Inc.	Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report	☑ Yes ☐ No
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com
		Email 2	chris@elr.ca

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.18	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

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

R ☑ Regular (Standard TAT if received by 3 pm - business days)

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

E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT

E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge

Specify Date Required for E2,E or P:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F/P Low Level Diss. Met (incl. Hg) and Hardness	P Low Level Tot. Met (incl. Hg) and Hardness	P Chromium Speciation (III/VI) - Total	F/P Chromium Speciation (III/VI) - Dissolved	P Ammonia - N	F/P Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity	Asbestos-TEM-AD	Total Suspended Solids	Number of Containers
	E3	20-Jul-16	8:05	Water	R	R			R	R	R	R	R	R	R	R	R	11
	R3	19-Jul-16	16:50	Water	R	R			R	R	R	R	R	R	R	R	R	11
	R7	20-Jul-16	13:20	Water	R	R			R	R	R	R	R	R	R		R	10
	R11	19-Jul-16	14:30	Water	R	R			R	R	R	R	R	R	R		R	10
	GWCC-1	20-Jul-16	17:15	Water	R	R			R	R	R	R	R	R	R		R	10
	GWCC-2	20-Jul-16	16:50	Water	R	R			R	R	R	R	R	R	R		R	10
	GWCC-3	20-Jul-16	16:15	Water	R	R			R	R	R	R	R	R	R		R	10
	GWCC-4	20-Jul-16	17:45	Water	R	R			R	R	R	R	R	R	R		R	10
	Travel Blank					R			R	R	R	R	R	R	R		R	7
	Dup1	20-Jul-16	16:15	Water	R	R			R	R	R	R	R	R	R		R	10
	FB-1	20-Jul-16	8:05	Water	R	R			R	R	R	R	R	R	R		R	10

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☑ No

Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐		SIF Observations	Yes ☐	No ☐
Ice packs	Yes ☑	No ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☑				

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C			
0.8	1.0				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Jul 22	Time: 10:30	Received by:	Date: 22-Jul-16	Time: 10:30	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

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

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

HEMMERA ENVIROCHEM INC.
ATTN: Natasha Sandys
230 - 2237 2nd Avenue
Whitehorse YK Y1A 0K7

Date Received: 26-JUL-16
Report Date: 17-AUG-16 15:54 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1803696

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.17
C of C Numbers: 1, 2, 3
Legal Site Desc:

Comments: 17-AUG-2016 This version of the report includes speciated chromium data for samples 1, 10, 12, 14, 16, 22, 23, 24, 25, and 26.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1803696-1	L1803696-2	L1803696-3	L1803696-4	L1803696-5
Description	Water	Water	Water	Water	Water
Sampled Date	22-JUL-16	24-JUL-16	22-JUL-16	24-JUL-16	
Sampled Time	10:10	11:50	10:45	11:10	
Client ID	E1	E1	E1 (H)	E1 (H)	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)		549		546	<2.0
Hardness (as CaCO3) (mg/L)	289		289		<0.50
pH (pH)		8.16		7.93	5.42
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.0179		0.0150		0.0150 RRV
Nitrate (as N) (mg/L)		0.116		0.120	<0.0050
Nitrite (as N) (mg/L)		0.0018		0.0041	<0.0010
Phosphorus (P)-Total (mg/L)	0.0031		0.0044		<0.0020
Sulfate (SO4) (mg/L)		158		159	<0.30
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	14.4		14.5		
Total Metals Aluminum (Al)-Total (mg/L)	0.0761		0.0530		<0.0030
Antimony (Sb)-Total (mg/L)	0.00034		0.00031		<0.00010
Arsenic (As)-Total (mg/L)	0.00094		0.00080		<0.00010
Barium (Ba)-Total (mg/L)	0.0592		0.0587		<0.000050
Beryllium (Be)-Total (mg/L)	<0.000020		<0.000020		<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		<0.000050
Boron (B)-Total (mg/L)	0.010		<0.010		<0.010
Cadmium (Cd)-Total (mg/L)	0.0000450		0.0000437		<0.0000050
Calcium (Ca)-Total (mg/L)	63.7		64.6		<0.050
Chromium (Cr)-Total (mg/L)	0.00117		0.00049		<0.00010
Cobalt (Co)-Total (mg/L)	0.00041		0.00043		<0.00010
Copper (Cu)-Total (mg/L)	0.00295		0.00295		<0.00050
Iron (Fe)-Total (mg/L)	0.255		0.228		<0.010
Lead (Pb)-Total (mg/L)	0.000131		0.000118		<0.000050
Lithium (Li)-Total (mg/L)	0.0028		0.0026		<0.0010
Magnesium (Mg)-Total (mg/L)	30.5		30.6		<0.10
Manganese (Mn)-Total (mg/L)	0.109		0.151		<0.00010
Mercury (Hg)-Total (mg/L)	0.0000057		<0.0000050		<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.00135		0.00133		<0.000050
Nickel (Ni)-Total (mg/L)	0.00627		0.00407		<0.00050
Phosphorus (P)-Total (mg/L)	<0.050		<0.050		<0.050
Potassium (K)-Total (mg/L)	0.62		0.60		<0.10
Selenium (Se)-Total (mg/L)	0.00169		0.00170		<0.000050
Silicon (Si)-Total (mg/L)	4.11		4.18		<0.050
Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		<0.000010
Sodium (Na)-Total (mg/L)	2.83		2.73		<0.050
Strontium (Sr)-Total (mg/L)	0.291		0.295		<0.00020

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-6 Water 21-JUL-16 17:15 E2	L1803696-7 Water 24-JUL-16 12:10 E2	L1803696-8 Water 21-JUL-16 15:15 E4	L1803696-9 Water 24-JUL-16 12:40 E4	L1803696-10 Water 22-JUL-16 15:15 E7
WATER						
Physical Tests	Conductivity (uS/cm)	389	604	429	630	413
	Hardness (as CaCO3) (mg/L)					
	pH (pH)	8.12			8.08	
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0159		0.0110		0.0336
	Nitrate (as N) (mg/L)		0.112		0.108	
	Nitrite (as N) (mg/L)		<0.0010		<0.0010	
	Phosphorus (P)-Total (mg/L)	0.0038		0.0041		0.0564
	Sulfate (SO4) (mg/L)		184		193	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	13.4		12.5		13.7
Total Metals	Aluminum (Al)-Total (mg/L)	0.0313		0.0459		2.71
	Antimony (Sb)-Total (mg/L)	0.00042		0.00048		0.00057
	Arsenic (As)-Total (mg/L)	0.00119		0.00120		0.00442
	Barium (Ba)-Total (mg/L)	0.0541		0.0523		0.127
	Beryllium (Be)-Total (mg/L)	<0.000020		<0.000020		0.000096
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		<0.000050
	Boron (B)-Total (mg/L)	0.031		0.045		0.034
	Cadmium (Cd)-Total (mg/L)	0.0000497		0.0000419		0.000178
	Calcium (Ca)-Total (mg/L)	77.5		78.0		74.5
	Chromium (Cr)-Total (mg/L)	0.00056		0.00066		0.00779
	Cobalt (Co)-Total (mg/L)	0.00054		0.00051		0.00315
	Copper (Cu)-Total (mg/L)	0.00360		0.00213		0.00960
	Iron (Fe)-Total (mg/L)	0.247		0.285		4.79
	Lead (Pb)-Total (mg/L)	0.000071		0.000085		0.00319
	Lithium (Li)-Total (mg/L)	0.0067		0.0094		0.0097
	Magnesium (Mg)-Total (mg/L)	47.8		54.0		51.4
	Manganese (Mn)-Total (mg/L)	0.0996		0.100		0.367
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.0000050		0.0000123
	Molybdenum (Mo)-Total (mg/L)	0.00170		0.00169		0.00164
	Nickel (Ni)-Total (mg/L)	0.0135		0.0146		0.0220
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050		0.136
	Potassium (K)-Total (mg/L)	0.85		0.92		1.49
	Selenium (Se)-Total (mg/L)	0.00162		0.00134		0.00135
	Silicon (Si)-Total (mg/L)	4.46		4.54		8.67
	Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		0.000065
	Sodium (Na)-Total (mg/L)	3.50		4.31		4.06
	Strontium (Sr)-Total (mg/L)	0.412		0.451		0.416

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-11 Water 24-JUL-16 13:10 E7	L1803696-12 Water 22-JUL-16 17:10 E8	L1803696-13 Water 24-JUL-16 13:00 E8	L1803696-14 Water 21-JUL-16 13:45 R4	L1803696-15 Water 24-JUL-16 12:45 R4
WATER						
Physical Tests	Conductivity (uS/cm)	624		162		535
	Hardness (as CaCO3) (mg/L)		80.0		395	
	pH (pH)	8.09		7.78		8.17
Anions and Nutrients	Ammonia, Total (as N) (mg/L)		0.0172		0.0229	
	Nitrate (as N) (mg/L)	0.139		0.0982		0.160
	Nitrite (as N) (mg/L)	<0.0010		<0.0010		<0.0010
	Phosphorus (P)-Total (mg/L)		0.0379		0.0256	
	Sulfate (SO4) (mg/L)	187		26.4		137
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		15.3		11.8	
Total Metals	Aluminum (Al)-Total (mg/L)		2.58		1.55	
	Antimony (Sb)-Total (mg/L)		0.00022		0.00047	
	Arsenic (As)-Total (mg/L)		0.00203		0.00410	
	Barium (Ba)-Total (mg/L)		0.0804		0.116	
	Beryllium (Be)-Total (mg/L)		0.000097		0.000054	
	Bismuth (Bi)-Total (mg/L)		<0.000050		0.000053	
	Boron (B)-Total (mg/L)		<0.010		<0.010	
	Cadmium (Cd)-Total (mg/L)		0.0000814		0.000190	
	Calcium (Ca)-Total (mg/L)		21.4		83.2	
	Chromium (Cr)-Total (mg/L)		0.00495		0.00398	
	Cobalt (Co)-Total (mg/L)		0.00190		0.00204	
	Copper (Cu)-Total (mg/L)		0.0104		0.00625	
	Iron (Fe)-Total (mg/L)		3.47		2.64	
	Lead (Pb)-Total (mg/L)		0.00148		0.00135	
	Lithium (Li)-Total (mg/L)		0.0039		0.0047	
	Magnesium (Mg)-Total (mg/L)		7.42		41.1	
	Manganese (Mn)-Total (mg/L)		0.0989		0.228	
	Mercury (Hg)-Total (mg/L)		<0.000025 DLM		<0.000025 DLM	
	Molybdenum (Mo)-Total (mg/L)		0.000459		0.00147	
	Nickel (Ni)-Total (mg/L)		0.00679		0.0238	
	Phosphorus (P)-Total (mg/L)		0.069		0.068	
	Potassium (K)-Total (mg/L)		1.07		0.78	
	Selenium (Se)-Total (mg/L)		0.000231		0.00180	
	Silicon (Si)-Total (mg/L)		8.72		7.45	
	Silver (Ag)-Total (mg/L)		0.000031		0.000058	
	Sodium (Na)-Total (mg/L)		2.99		5.03	
	Strontium (Sr)-Total (mg/L)		0.115		0.451	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-16 Water 22-JUL-16 18:20 R6	L1803696-17 Water 24-JUL-16 13:30 R6	L1803696-18 Water 22-JUL-16 08:30 GWCC-5	L1803696-19 Water 24-JUL-16 12:00 GWCC-5	L1803696-20 Water 22-JUL-16 08:30 DUP2
WATER						
Physical Tests	Conductivity (uS/cm)		152		962	
	Hardness (as CaCO3) (mg/L)	74.7		562		556
	pH (pH)		7.74		7.98	
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	0.0174		<0.0050		<0.0050
	Nitrate (as N) (mg/L)		0.0967		0.0053	
	Nitrite (as N) (mg/L)		<0.0010		<0.0010	
	Phosphorus (P)-Total (mg/L)	0.0383		<0.0020		<0.0020
	Sulfate (SO4) (mg/L)		23.2		310	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	15.1		7.16		7.10
Total Metals	Aluminum (Al)-Total (mg/L)	2.54		0.0046		<0.0030
	Antimony (Sb)-Total (mg/L)	0.00018		0.00076		0.00076
	Arsenic (As)-Total (mg/L)	0.00201		0.00082		0.00076
	Barium (Ba)-Total (mg/L)	0.0774		0.0516		0.0533
	Beryllium (Be)-Total (mg/L)	0.000100		<0.000020		<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		<0.000050
	Boron (B)-Total (mg/L)	<0.010		0.031		0.032
	Cadmium (Cd)-Total (mg/L)	0.0000799		0.000107		0.000110
	Calcium (Ca)-Total (mg/L)	20.9		126		127
	Chromium (Cr)-Total (mg/L)	0.00505		0.00068		0.00070
	Cobalt (Co)-Total (mg/L)	0.00196		<0.00010		<0.00010
	Copper (Cu)-Total (mg/L)	0.00748		0.00086		0.00088
	Iron (Fe)-Total (mg/L)	3.78		0.053		0.052
	Lead (Pb)-Total (mg/L)	0.00166		<0.000050		<0.000050
	Lithium (Li)-Total (mg/L)	0.0041		0.0097		0.0097
	Magnesium (Mg)-Total (mg/L)	6.97		58.0		58.3
	Manganese (Mn)-Total (mg/L)	0.101		0.00346		0.00341
	Mercury (Hg)-Total (mg/L)	<0.000025 DLM		<0.0000050		<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.000450		0.00192		0.00192
	Nickel (Ni)-Total (mg/L)	0.00649		0.0191		0.0195
	Phosphorus (P)-Total (mg/L)	0.088		<0.050		<0.050
	Potassium (K)-Total (mg/L)	1.04		0.77		0.77
	Selenium (Se)-Total (mg/L)	0.000253		0.00742		0.00738
	Silicon (Si)-Total (mg/L)	8.72		4.45		4.47
	Silver (Ag)-Total (mg/L)	0.000035		<0.000010		<0.000010
	Sodium (Na)-Total (mg/L)	2.77		3.94		3.99
	Strontium (Sr)-Total (mg/L)	0.114		0.717		0.703

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-21 Water 24-JUL-16 12:00 DUP2	L1803696-22 Water 23-JUL-16 14:05 R1	L1803696-23 Water 23-JUL-16 15:55 R2	L1803696-24 Water 23-JUL-16 17:15 R8	L1803696-25 Water 23-JUL-16 18:15 R9
WATER						
Physical Tests	Conductivity (uS/cm)	963	422	416	280	240
	Hardness (as CaCO3) (mg/L)		219	225	134	125
	pH (pH)	7.99	7.87	7.99	7.74	7.52
Anions and Nutrients	Ammonia, Total (as N) (mg/L)		0.0610	0.0352	0.0072	0.114
	Nitrate (as N) (mg/L)	<0.0050	0.258	0.0475	<0.0050	0.212
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)		0.338	0.0730	0.0074	0.373
	Sulfate (SO4) (mg/L)	310	117	104	80.6	60.4
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		18.3	18.9	18.8	34.3
Total Metals	Aluminum (Al)-Total (mg/L)		5.07	4.60	0.191	8.54
	Antimony (Sb)-Total (mg/L)		0.00069	0.00053	0.00109	0.00058
	Arsenic (As)-Total (mg/L)		0.00547	0.00415	0.00063	0.00662
	Barium (Ba)-Total (mg/L)		0.162	0.170	0.0582	0.283
	Beryllium (Be)-Total (mg/L)		0.000167	0.000152	<0.000020	0.000280
	Bismuth (Bi)-Total (mg/L)		0.000074	0.000051	<0.000050	0.000097
	Boron (B)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)		0.000403	0.000118	0.0000438	0.000342
	Calcium (Ca)-Total (mg/L)		56.0	40.2	32.3	37.6
	Chromium (Cr)-Total (mg/L)		0.0139	0.0110	0.00155	0.0194
	Cobalt (Co)-Total (mg/L)		0.00483	0.00339	0.00020	0.00735
	Copper (Cu)-Total (mg/L)		0.0161	0.00914	0.00365	0.0247
	Iron (Fe)-Total (mg/L)		9.02	7.13	0.334	14.1
	Lead (Pb)-Total (mg/L)		0.00657	0.00305	0.000151	0.00593
	Lithium (Li)-Total (mg/L)		0.0055	0.0069	<0.0010	0.0069
	Magnesium (Mg)-Total (mg/L)		21.7	29.7	12.2	14.8
	Manganese (Mn)-Total (mg/L)		0.363	0.235	0.0182	0.480
	Mercury (Hg)-Total (mg/L)		0.000155	<0.000025 DLM	0.0000078	<0.000050 DLM
	Molybdenum (Mo)-Total (mg/L)		0.00198	0.000670	0.00106	0.00126
	Nickel (Ni)-Total (mg/L)		0.0184	0.0109	0.00437	0.0216
	Phosphorus (P)-Total (mg/L)		0.232	0.165	<0.050	0.436
	Potassium (K)-Total (mg/L)		1.14	0.87	<0.10	0.92
	Selenium (Se)-Total (mg/L)		0.00204	0.000553	0.000800	0.00119
	Silicon (Si)-Total (mg/L)		11.6	12.4	5.89	17.8
	Silver (Ag)-Total (mg/L)		0.000171	0.000045	0.000012	0.000129
	Sodium (Na)-Total (mg/L)		2.28	2.52	4.19	2.18
	Strontium (Sr)-Total (mg/L)		0.235	0.213	0.125	0.144

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1803696-26				
	Description	Water				
	Sampled Date	24-JUL-16				
	Sampled Time	08:50				
	Client ID	SL				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1600				
	Hardness (as CaCO3) (mg/L)	1020				
	pH (pH)	8.37				
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	<0.0050				
	Nitrate (as N) (mg/L)	<0.010 DLDS				
	Nitrite (as N) (mg/L)	<0.0020 DLDS				
	Phosphorus (P)-Total (mg/L)	0.0023				
	Sulfate (SO4) (mg/L)	735				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	8.56				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0439				
	Antimony (Sb)-Total (mg/L)	0.00284				
	Arsenic (As)-Total (mg/L)	0.0151				
	Barium (Ba)-Total (mg/L)	0.0289				
	Beryllium (Be)-Total (mg/L)	<0.000020				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.044				
	Cadmium (Cd)-Total (mg/L)	0.0000270				
	Calcium (Ca)-Total (mg/L)	227				
	Chromium (Cr)-Total (mg/L)	0.00221				
	Cobalt (Co)-Total (mg/L)	0.00019				
	Copper (Cu)-Total (mg/L)	0.00120				
	Iron (Fe)-Total (mg/L)	0.084				
	Lead (Pb)-Total (mg/L)	0.000053				
	Lithium (Li)-Total (mg/L)	0.0104				
	Magnesium (Mg)-Total (mg/L)	108				
	Manganese (Mn)-Total (mg/L)	0.00465				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	0.00202				
	Nickel (Ni)-Total (mg/L)	0.0195				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	1.47				
	Selenium (Se)-Total (mg/L)	0.0160				
	Silicon (Si)-Total (mg/L)	3.72				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	2.65				
	Strontium (Sr)-Total (mg/L)	0.988				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1803696-1	L1803696-2	L1803696-3	L1803696-4	L1803696-5
Description	Water	Water	Water	Water	Water
Sampled Date	22-JUL-16	24-JUL-16	22-JUL-16	24-JUL-16	
Sampled Time	10:10	11:50	10:45	11:10	
Client ID	E1	E1	E1 (H)	E1 (H)	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Total Metals Sulfur (S)-Total (mg/L)	53.9		54.6		<0.50
Thallium (Tl)-Total (mg/L)	0.000013		<0.000010		<0.000010
Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		<0.00010
Titanium (Ti)-Total (mg/L)	0.00215		0.00160		<0.00030
Uranium (U)-Total (mg/L)	0.00192		0.00198		<0.000010
Vanadium (V)-Total (mg/L)	0.00074		0.00070		<0.00050
Zinc (Zn)-Total (mg/L)	<0.0030		<0.0030		<0.0030
Zirconium (Zr)-Total (mg/L)	0.00077		0.00079		<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD		FIELD		
Dissolved Metals Filtration Location	FIELD		FIELD		
Aluminum (Al)-Dissolved (mg/L)	0.0319		0.0385		
Antimony (Sb)-Dissolved (mg/L)	0.00028		0.00029		
Arsenic (As)-Dissolved (mg/L)	0.00080		0.00075		
Barium (Ba)-Dissolved (mg/L)	0.0586		0.0587		
Beryllium (Be)-Dissolved (mg/L)	<0.000020		<0.000020		
Bismuth (Bi)-Dissolved (mg/L)	<0.000050		<0.000050		
Boron (B)-Dissolved (mg/L)	<0.010		<0.010		
Cadmium (Cd)-Dissolved (mg/L)	0.0000319		0.0000322		
Calcium (Ca)-Dissolved (mg/L)	63.4		64.0		
Chromium (Cr)-Dissolved (mg/L)	0.00036		0.00035		
Cobalt (Co)-Dissolved (mg/L)	0.00031		0.00040		
Copper (Cu)-Dissolved (mg/L)	0.00265		0.00272		
Iron (Fe)-Dissolved (mg/L)	0.137		0.169		
Lead (Pb)-Dissolved (mg/L)	0.000051		0.000063		
Lithium (Li)-Dissolved (mg/L)	0.0026		0.0029		
Magnesium (Mg)-Dissolved (mg/L)	31.7		31.5		
Manganese (Mn)-Dissolved (mg/L)	0.0904		0.149		
Mercury (Hg)-Dissolved (mg/L)	<0.0000050		<0.0000050		
Molybdenum (Mo)-Dissolved (mg/L)	0.00110		0.00111		
Nickel (Ni)-Dissolved (mg/L)	0.00472		0.00393		
Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050		
Potassium (K)-Dissolved (mg/L)	0.58		0.59		
Selenium (Se)-Dissolved (mg/L)	0.00187		0.00176		
Silicon (Si)-Dissolved (mg/L)	4.03		4.14		
Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		
Sodium (Na)-Dissolved (mg/L)	2.82		2.76		
Strontium (Sr)-Dissolved (mg/L)	0.287		0.288		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-6 Water 21-JUL-16 17:15 E2	L1803696-7 Water 24-JUL-16 12:10 E2	L1803696-8 Water 21-JUL-16 15:15 E4	L1803696-9 Water 24-JUL-16 12:40 E4	L1803696-10 Water 22-JUL-16 15:15 E7
WATER						
Total Metals	Sulfur (S)-Total (mg/L)	81.0		85.3		77.8
	Thallium (Tl)-Total (mg/L)	0.000024		0.000018		0.000048
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		<0.00010
	Titanium (Ti)-Total (mg/L)	0.00063		0.00147		0.0770
	Uranium (U)-Total (mg/L)	0.00211		0.00229		0.00246
	Vanadium (V)-Total (mg/L)	<0.00050		0.00051		0.00828
	Zinc (Zn)-Total (mg/L)	<0.0030		<0.0030		0.0322
	Zirconium (Zr)-Total (mg/L)	0.00063		0.00073		0.00088
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD		FIELD		FIELD
	Dissolved Metals Filtration Location	FIELD		FIELD		FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0248		0.0168		0.0268
	Antimony (Sb)-Dissolved (mg/L)	0.00038		0.00047		0.00038
	Arsenic (As)-Dissolved (mg/L)	0.00100		0.00110		0.00099
	Barium (Ba)-Dissolved (mg/L)	0.0538		0.0526		0.0638
	Beryllium (Be)-Dissolved (mg/L)	<0.000020		<0.000020		<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050		<0.000050		<0.000050
	Boron (B)-Dissolved (mg/L)	0.028		0.043		0.034
	Cadmium (Cd)-Dissolved (mg/L)	0.0000506		0.0000353		0.0000382
	Calcium (Ca)-Dissolved (mg/L)	75.7		78.7		76.1
	Chromium (Cr)-Dissolved (mg/L)	0.00040		0.00047		0.00049
	Cobalt (Co)-Dissolved (mg/L)	0.00052		0.00047		0.00063
	Copper (Cu)-Dissolved (mg/L)	0.00221		0.00193		0.00222
	Iron (Fe)-Dissolved (mg/L)	0.188		0.185		0.182
	Lead (Pb)-Dissolved (mg/L)	<0.000050		<0.000050		0.000079
	Lithium (Li)-Dissolved (mg/L)	0.0067		0.0094		0.0082
	Magnesium (Mg)-Dissolved (mg/L)	48.5		56.4		54.1
	Manganese (Mn)-Dissolved (mg/L)	0.0915		0.0942		0.203
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050		<0.0000050		<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.00143		0.00148		0.00132
	Nickel (Ni)-Dissolved (mg/L)	0.0124		0.0142		0.0104
	Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050		<0.050
	Potassium (K)-Dissolved (mg/L)	0.80		0.92		0.95
	Selenium (Se)-Dissolved (mg/L)	0.00157		0.00137		0.00114
	Silicon (Si)-Dissolved (mg/L)	4.32		4.53		4.62
	Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)	3.52		4.29		3.93
	Strontium (Sr)-Dissolved (mg/L)	0.398		0.450		0.411

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-11 Water 24-JUL-16 13:10 E7	L1803696-12 Water 22-JUL-16 17:10 E8	L1803696-13 Water 24-JUL-16 13:00 E8	L1803696-14 Water 21-JUL-16 13:45 R4	L1803696-15 Water 24-JUL-16 12:45 R4
Sample ID / **Description** / **Sampled Date** / **Sampled Time** / **Client ID**						
WATER						
Total Metals	Sulfur (S)-Total (mg/L)		9.60		65.5	
	Thallium (Tl)-Total (mg/L)		0.000028		0.000030	
	Tin (Sn)-Total (mg/L)		<0.00010		<0.00010	
	Titanium (Ti)-Total (mg/L)		0.0890		0.0374	
	Uranium (U)-Total (mg/L)		0.000827		0.00466	
	Vanadium (V)-Total (mg/L)		0.00767		0.00508	
	Zinc (Zn)-Total (mg/L)		0.0186		0.0130	
	Zirconium (Zr)-Total (mg/L)		0.00071		0.00095	
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	
	Dissolved Metals Filtration Location		FIELD		FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0995		0.0146	
	Antimony (Sb)-Dissolved (mg/L)		0.00011		0.00035	
	Arsenic (As)-Dissolved (mg/L)		0.00063		0.00234	
	Barium (Ba)-Dissolved (mg/L)		0.0369		0.0694	
	Beryllium (Be)-Dissolved (mg/L)		0.000021		<0.000020	
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050		<0.000050	
	Boron (B)-Dissolved (mg/L)		<0.010		<0.010	
	Cadmium (Cd)-Dissolved (mg/L)		0.0000083		0.0000511	
	Calcium (Ca)-Dissolved (mg/L)		20.9		85.3	
	Chromium (Cr)-Dissolved (mg/L)		0.00037		0.00030	
	Cobalt (Co)-Dissolved (mg/L)		0.00028		0.00089	
	Copper (Cu)-Dissolved (mg/L)		0.00274		0.00175	
	Iron (Fe)-Dissolved (mg/L)		0.279		0.162	
	Lead (Pb)-Dissolved (mg/L)		0.000063		<0.000050	
	Lithium (Li)-Dissolved (mg/L)		0.0023		0.0038	
	Magnesium (Mg)-Dissolved (mg/L)		6.77		44.1	
	Manganese (Mn)-Dissolved (mg/L)		0.0238		0.150	
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050		<0.0000050	
	Molybdenum (Mo)-Dissolved (mg/L)		0.000342		0.00121	
	Nickel (Ni)-Dissolved (mg/L)		0.00225		0.0156	
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	
	Potassium (K)-Dissolved (mg/L)		0.79		0.59	
	Selenium (Se)-Dissolved (mg/L)		0.000173		0.00185	
	Silicon (Si)-Dissolved (mg/L)		5.23		5.23	
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	
	Sodium (Na)-Dissolved (mg/L)		2.79		5.17	
	Strontium (Sr)-Dissolved (mg/L)		0.108		0.460	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1803696-16	L1803696-17	L1803696-18	L1803696-19	L1803696-20
Description	Water	Water	Water	Water	Water
Sampled Date	22-JUL-16	24-JUL-16	22-JUL-16	24-JUL-16	22-JUL-16
Sampled Time	18:20	13:30	08:30	12:00	08:30
Client ID	R6	R6	GWCC-5	GWCC-5	DUP2
Grouping / **Analyte**					
WATER					
Total Metals Sulfur (S)-Total (mg/L)	8.85		111		111
Thallium (Tl)-Total (mg/L)	0.000028		0.000016		0.000015
Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		<0.00010
Titanium (Ti)-Total (mg/L)	0.0870		<0.00030		<0.00030
Uranium (U)-Total (mg/L)	0.000854		0.00247		0.00239
Vanadium (V)-Total (mg/L)	0.00782		<0.00050		<0.00050
Zinc (Zn)-Total (mg/L)	0.0153		<0.0030		<0.0030
Zirconium (Zr)-Total (mg/L)	0.00073		<0.00030		<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD		FIELD		FIELD
Dissolved Metals Filtration Location	FIELD		FIELD		FIELD
Aluminum (Al)-Dissolved (mg/L)	0.112		0.0015		0.0019
Antimony (Sb)-Dissolved (mg/L)	0.00011		0.00076		0.00074
Arsenic (As)-Dissolved (mg/L)	0.00071		0.00069		0.00072
Barium (Ba)-Dissolved (mg/L)	0.0389		0.0536		0.0561
Beryllium (Be)-Dissolved (mg/L)	0.000024		<0.000020		<0.000020
Bismuth (Bi)-Dissolved (mg/L)	<0.000050		<0.000050		<0.000050
Boron (B)-Dissolved (mg/L)	<0.010		0.030		0.030
Cadmium (Cd)-Dissolved (mg/L)	0.0000170		0.000109		0.000115
Calcium (Ca)-Dissolved (mg/L)	19.9		126		124
Chromium (Cr)-Dissolved (mg/L)	0.00040		0.00062		0.00064
Cobalt (Co)-Dissolved (mg/L)	0.00031		<0.00010		<0.00010
Copper (Cu)-Dissolved (mg/L)	0.00305		0.00078		0.00079
Iron (Fe)-Dissolved (mg/L)	0.271		0.038		0.039
Lead (Pb)-Dissolved (mg/L)	0.000065		<0.000050		<0.000050
Lithium (Li)-Dissolved (mg/L)	0.0023		0.0096		0.0098
Magnesium (Mg)-Dissolved (mg/L)	6.11		59.9		59.7
Manganese (Mn)-Dissolved (mg/L)	0.0248		0.00316		0.00312
Mercury (Hg)-Dissolved (mg/L)	<0.0000050		<0.0000050		<0.0000050
Molybdenum (Mo)-Dissolved (mg/L)	0.000316		0.00167		0.00168
Nickel (Ni)-Dissolved (mg/L)	0.00239		0.0193		0.0194
Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050		<0.050
Potassium (K)-Dissolved (mg/L)	0.77		0.79		0.75
Selenium (Se)-Dissolved (mg/L)	0.000182		0.00769		0.00731
Silicon (Si)-Dissolved (mg/L)	5.15		4.52		4.40
Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		<0.000010
Sodium (Na)-Dissolved (mg/L)	2.97		4.02		4.05
Strontium (Sr)-Dissolved (mg/L)	0.106		0.697		0.699

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1803696-21	L1803696-22	L1803696-23	L1803696-24	L1803696-25
Description	Water	Water	Water	Water	Water
Sampled Date	24-JUL-16	23-JUL-16	23-JUL-16	23-JUL-16	23-JUL-16
Sampled Time	12:00	14:05	15:55	17:15	18:15
Client ID	DUP2	R1	R2	R8	R9
Grouping / **Analyte**					
WATER					
Total Metals Sulfur (S)-Total (mg/L)		39.5	35.1	26.8	20.9
Thallium (Tl)-Total (mg/L)		0.000076	0.000044	<0.000010	0.000062
Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	0.00011
Titanium (Ti)-Total (mg/L)		0.115	0.111	0.00454	0.244
Uranium (U)-Total (mg/L)		0.00157	0.00243	0.000086	0.00104
Vanadium (V)-Total (mg/L)		0.0145	0.0141	0.00103	0.0274
Zinc (Zn)-Total (mg/L)		0.0413	0.0201	0.0041	0.0476
Zirconium (Zr)-Total (mg/L)		0.00134	0.00099	0.00067	0.00209
Dissolved Metals Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved (mg/L)		0.0749	0.0941	0.0456	0.198
Antimony (Sb)-Dissolved (mg/L)		0.00026	0.00034	0.00105	0.00023
Arsenic (As)-Dissolved (mg/L)		0.00067	0.00095	0.00043	0.00136
Barium (Ba)-Dissolved (mg/L)		0.0509	0.0630	0.0499	0.0879
Beryllium (Be)-Dissolved (mg/L)		<0.000020	0.000020	<0.000020	0.000034
Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)		0.0000465	0.0000131	0.0000318	0.0000361
Calcium (Ca)-Dissolved (mg/L)		55.1	39.9	33.1	32.2
Chromium (Cr)-Dissolved (mg/L)		0.00053	0.00103	0.00107	0.00145
Cobalt (Co)-Dissolved (mg/L)		0.00038	0.00036	<0.00010	0.00082
Copper (Cu)-Dissolved (mg/L)		0.00322	0.00219	0.00236	0.00521
Iron (Fe)-Dissolved (mg/L)		0.292	0.503	0.083	0.985
Lead (Pb)-Dissolved (mg/L)		0.000100	0.000076	<0.000050	0.000132
Lithium (Li)-Dissolved (mg/L)		0.0018	0.0035	<0.0010	<0.0010
Magnesium (Mg)-Dissolved (mg/L)		19.8	30.4	12.4	10.8
Manganese (Mn)-Dissolved (mg/L)		0.0984	0.0971	0.00821	0.209
Mercury (Hg)-Dissolved (mg/L)		0.0000070	<0.0000050	<0.0000050	0.0000076
Molybdenum (Mo)-Dissolved (mg/L)		0.000831	0.000436	0.000680	0.000676
Nickel (Ni)-Dissolved (mg/L)		0.00328	0.00340	0.00354	0.00426
Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)		0.45	0.51	<0.10	0.29
Selenium (Se)-Dissolved (mg/L)		0.00160	0.000378	0.000790	0.000811
Silicon (Si)-Dissolved (mg/L)		4.50	5.78	5.93	5.05
Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)		1.98	2.30	3.79	1.70
Strontium (Sr)-Dissolved (mg/L)		0.216	0.191	0.128	0.109

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1803696-26
	Description	Water
	Sampled Date	24-JUL-16
	Sampled Time	08:50
	Client ID	SL
Grouping	**Analyte**	
WATER		
Total Metals	Sulfur (S)-Total (mg/L)	256
	Thallium (Tl)-Total (mg/L)	0.000016
	Tin (Sn)-Total (mg/L)	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00103
	Uranium (U)-Total (mg/L)	0.00339
	Vanadium (V)-Total (mg/L)	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD
	Dissolved Metals Filtration Location	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0018
	Antimony (Sb)-Dissolved (mg/L)	0.00281
	Arsenic (As)-Dissolved (mg/L)	0.0144
	Barium (Ba)-Dissolved (mg/L)	0.0279
	Beryllium (Be)-Dissolved (mg/L)	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050
	Boron (B)-Dissolved (mg/L)	0.041
	Cadmium (Cd)-Dissolved (mg/L)	0.0000139
	Calcium (Ca)-Dissolved (mg/L)	230
	Chromium (Cr)-Dissolved (mg/L)	0.00104
	Cobalt (Co)-Dissolved (mg/L)	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00095
	Iron (Fe)-Dissolved (mg/L)	<0.010
	Lead (Pb)-Dissolved (mg/L)	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0102
	Magnesium (Mg)-Dissolved (mg/L)	109
	Manganese (Mn)-Dissolved (mg/L)	0.00165
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.00170
	Nickel (Ni)-Dissolved (mg/L)	0.0170
	Phosphorus (P)-Dissolved (mg/L)	<0.050
	Potassium (K)-Dissolved (mg/L)	1.44
	Selenium (Se)-Dissolved (mg/L)	0.0156
	Silicon (Si)-Dissolved (mg/L)	3.47
	Silver (Ag)-Dissolved (mg/L)	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.52
	Strontium (Sr)-Dissolved (mg/L)	0.907

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1803696-1	L1803696-2	L1803696-3	L1803696-4	L1803696-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	22-JUL-16	24-JUL-16	22-JUL-16	24-JUL-16	
	Sampled Time	10:10	11:50	10:45	11:10	
	Client ID	E1	E1	E1 (H)	E1 (H)	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Dissolved Metals	Sulfur (S)-Dissolved (mg/L)	52.1		51.9		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010		<0.000010		
	Tin (Sn)-Dissolved (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	0.00062		0.00084		
	Uranium (U)-Dissolved (mg/L)	0.00180		0.00185		
	Vanadium (V)-Dissolved (mg/L)	<0.00050		<0.00050		
	Zinc (Zn)-Dissolved (mg/L)	0.0018		0.0013		
	Zirconium (Zr)-Dissolved (mg/L)	0.00068		0.00071		
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)	0.00117				
	Hexavalent Chromium (mg/L)	<0.0010				
	Hexavalent Chromium-Dissolved (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-6 Water 21-JUL-16 17:15 E2	L1803696-7 Water 24-JUL-16 12:10 E2	L1803696-8 Water 21-JUL-16 15:15 E4	L1803696-9 Water 24-JUL-16 12:40 E4	L1803696-10 Water 22-JUL-16 15:15 E7
WATER						
Dissolved Metals	Sulfur (S)-Dissolved (mg/L)	76.0		82.3		79.0
	Thallium (Tl)-Dissolved (mg/L)	0.000023		0.000020		<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010		<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00049		0.00045		0.00069
	Uranium (U)-Dissolved (mg/L)	0.00191		0.00215		0.00220
	Vanadium (V)-Dissolved (mg/L)	<0.00050		<0.00050		<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0031		0.0030		0.0078
	Zirconium (Zr)-Dissolved (mg/L)	0.00059		0.00071		0.00085
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)					0.00779
	Hexavalent Chromium (mg/L)					<0.0010
	Hexavalent Chromium-Dissolved (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-11 Water 24-JUL-16 13:10 E7	L1803696-12 Water 22-JUL-16 17:10 E8	L1803696-13 Water 24-JUL-16 13:00 E8	L1803696-14 Water 21-JUL-16 13:45 R4	L1803696-15 Water 24-JUL-16 12:45 R4
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Sulfur (S)-Dissolved (mg/L)		9.61		64.9	
	Thallium (Tl)-Dissolved (mg/L)		<0.000010		<0.000010	
	Tin (Sn)-Dissolved (mg/L)		<0.00010		<0.00010	
	Titanium (Ti)-Dissolved (mg/L)		0.00147		0.00036	
	Uranium (U)-Dissolved (mg/L)		0.000611		0.00442	
	Vanadium (V)-Dissolved (mg/L)		0.00103		<0.00050	
	Zinc (Zn)-Dissolved (mg/L)		0.0016		0.0019	
	Zirconium (Zr)-Dissolved (mg/L)		0.00073		0.00087	
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)		0.00495		0.00398	
	Hexavalent Chromium (mg/L)		<0.0010		<0.0010	
	Hexavalent Chromium-Dissolved (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1803696-16 Water 22-JUL-16 18:20 R6	L1803696-17 Water 24-JUL-16 13:30 R6	L1803696-18 Water 22-JUL-16 08:30 GWCC-5	L1803696-19 Water 24-JUL-16 12:00 GWCC-5	L1803696-20 Water 22-JUL-16 08:30 DUP2
WATER						
Dissolved Metals	Sulfur (S)-Dissolved (mg/L)	8.67		105		104
	Thallium (Tl)-Dissolved (mg/L)	<0.000010		0.000016		0.000015
	Tin (Sn)-Dissolved (mg/L)	<0.00010		<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00148		<0.00030		<0.00030
	Uranium (U)-Dissolved (mg/L)	0.000574		0.00230		0.00228
	Vanadium (V)-Dissolved (mg/L)	0.00108		<0.00050		<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0030		<0.0010		<0.0010
	Zirconium (Zr)-Dissolved (mg/L)	0.00076		<0.00030		<0.00030
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)	0.00505				
	Hexavalent Chromium (mg/L)	<0.0010				
	Hexavalent Chromium-Dissolved (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1803696-21	L1803696-22	L1803696-23	L1803696-24	L1803696-25
Description	Water	Water	Water	Water	Water
Sampled Date	24-JUL-16	23-JUL-16	23-JUL-16	23-JUL-16	23-JUL-16
Sampled Time	12:00	14:05	15:55	17:15	18:15
Client ID	DUP2	R1	R2	R8	R9
Grouping / **Analyte**					
WATER					
Dissolved Metals					
Sulfur (S)-Dissolved (mg/L)		39.4	34.5	27.3	20.1
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)		0.00160	0.00198	0.00079	0.00395
Uranium (U)-Dissolved (mg/L)		0.00109	0.00193	0.000061	0.000448
Vanadium (V)-Dissolved (mg/L)		<0.00050	0.00117	<0.00050	0.00154
Zinc (Zn)-Dissolved (mg/L)		0.0018	0.0015	0.0019	0.0022
Zirconium (Zr)-Dissolved (mg/L)		0.00120	0.00098	0.00067	0.00162
Speciated Metals					
Chromium (III)-Dissolved (mg/L)			<0.00042	0.00107	0.00045
Chromium (III)-Total (mg/L)		0.0139	0.00993	0.00155	0.0183
Hexavalent Chromium (mg/L)		<0.0010	0.0011	<0.0010	0.0011
Hexavalent Chromium-Dissolved (mg/L)			0.0010	<0.0010	0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1803696-26
	Description	Water
	Sampled Date	24-JUL-16
	Sampled Time	08:50
	Client ID	SL
Grouping	**Analyte**	
WATER		
Dissolved Metals	Sulfur (S)-Dissolved (mg/L)	245
	Thallium (Tl)-Dissolved (mg/L)	0.000015
	Tin (Sn)-Dissolved (mg/L)	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00313
	Vanadium (V)-Dissolved (mg/L)	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	<0.0010
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030
Speciated Metals	Chromium (III)-Dissolved (mg/L)	<0.00042
	Chromium (III)-Total (mg/L)	<0.00076
	Hexavalent Chromium (mg/L)	0.0018
	Hexavalent Chromium-Dissolved (mg/L)	0.0016

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Dissolved Organic Carbon	MS-B	L1803696-1, -10, -14, -18, -20, -26, -3, -6, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Calcium (Ca)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Silicon (Si)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Sulfur (S)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Dissolved Organic Carbon	MS-B	L1803696-12, -16, -22, -23, -24, -25
Matrix Spike	Antimony (Sb)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Arsenic (As)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Boron (B)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Sodium (Na)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Strontium (Sr)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Uranium (U)-Total	MS-B	L1803696-18, -20, -22, -23
Matrix Spike	Antimony (Sb)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Boron (B)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1803696-1, -10, -12, -14, -16, -18, -20, -22, -23, -24, -25, -26, -3, -6, -8
Matrix Spike	Barium (Ba)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Manganese (Mn)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Sodium (Na)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8
Matrix Spike	Strontium (Sr)-Total	MS-B	L1803696-1, -10, -12, -14, -16, -24, -25, -26, -3, -5, -6, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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**

Reference Information

BE-D-L-CCMS-VA Water Diss. Be (low) in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-VA Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310B 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.

CR-CR3-DIS-CALC-ED Water Dissolved Trivalent Chromium in Water CALCULATION

Chromium (III)-Dissolved is calculated as the difference between the dissolved chromium and the dissolved hexavalent chromium (Cr(VI)) results.

CR-CR3-TOT-CALC-ED Water Total Trivalent Chromium in Water CALCULATION

Chromium (III)-Total is calculated as the difference between the total chromium and the hexavalent chromium (Cr(VI)) results.

CR-CR6-ED Water Chromium, Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on an un-filtered, field-preserved sample.

CR6-D-IC-ED Water Chromium, Dissolved Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on a field-filtered, field-preserved sample.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA Water Total Mercury in Water by CVAAS or CVAFS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Reference Information

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 APHA 4500 NH3-NITROGEN (AMMONIA)

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.

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.

NO2-L-IC-N-WR Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WR Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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.

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

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

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

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

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

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

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

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

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

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

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

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-IC-N-WR Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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

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

Laboratory Definition Code	Laboratory Location
	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Reference Information

ED	WR	
		ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA		ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2 3

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.

04-Aug-2016

Brent Mack
ALS Environmental
8081 Lougheed HWY
Suite 100
Burnaby, BC V5A1W9

Tel: (604) 253-4188
Fax:

Re: L1803696 Work Order: **1607863**

Dear Brent,

ALS Environmental received 16 samples on 28-Jul-2016 11:40 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 21.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 04-Aug-16

Client: ALS Environmental
Project: L1803696
Work Order: **1607863**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1607863-01	L1803696-1 E1	Water		7/22/2016	7/28/2016 11:40	☐
1607863-02	L1803696-3 E1 (H)	Water		7/22/2016	7/28/2016 11:40	☐
1607863-03	L1803696-5 TRAVEL BANK	Water		7/25/2016	7/28/2016 11:40	☐
1607863-04	L1803696-6 E2	Water		7/21/2016	7/28/2016 11:40	☐
1607863-05	L1803696-8 E4	Water		7/21/2016	7/28/2016 11:40	☐
1607863-06	L1803696-10 E7	Water		7/22/2016	7/28/2016 11:40	☐
1607863-07	L1803696-12 E8	Water		7/22/2016	7/28/2016 11:40	☐
1607863-08	L1803696-14 R4	Water		7/21/2016	7/28/2016 11:40	☐
1607863-09	L1803696-16 R6	Water		7/22/2016	7/28/2016 11:40	☐
1607863-10	L1803696-18 GWCC-5	Water		7/22/2016	7/28/2016 11:40	☐
1607863-11	L1803696-20 DUP2	Water		7/22/2016	7/28/2016 11:40	☐
1607863-12	L1803696-22 R1	Water		7/23/2016	7/28/2016 11:40	☐
1607863-13	L1803696-23 R2	Water		7/23/2016	7/28/2016 11:40	☐
1607863-14	L1803696-24 R8	Water		7/23/2016	7/28/2016 11:40	☐
1607863-15	L1803696-25 R9	Water		7/23/2016	7/28/2016 11:40	☐
1607863-16	L1803696-26 SL	Water		7/24/2016	7/28/2016 11:40	☐

ALS Environmental

Date: 04-Aug-16

Client: ALS Environmental
Project: L1803696
Work Order: 1607863

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *04-Aug-16*

Client: ALS Environmental
Project: L1803696 **Work Order:** 1607863
Sample ID: L1803696-1 E1 **Lab ID:** 1607863-01
Collection Date: 7/22/2016 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**2.6**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-3 E1 (H)	**Lab ID:**	1607863-02
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.5	mg/L	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client: ALS Environmental
Project: L1803696 **Work Order:** 1607863
Sample ID: L1803696-5 TRAVEL BANK **Lab ID:** 1607863-03
Collection Date: 7/25/2016 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.5	mg/L	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-6 E2	**Lab ID:**	1607863-04
Collection Date:	7/21/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.5	mg/L	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-8 E4	**Lab ID:**	1607863-05
Collection Date:	7/21/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**2.8**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-10 E7	**Lab ID:**	1607863-06
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**92**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-12 E8	**Lab ID:**	1607863-07
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**96**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-14 R4	**Lab ID:**	1607863-08
Collection Date:	7/21/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**67**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-16 R6	**Lab ID:**	1607863-09
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**100**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-18 GWCC-5	**Lab ID:**	1607863-10
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.5	mg/L	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-20 DUP2	**Lab ID:**	1607863-11
Collection Date:	7/22/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	ND		2.5	mg/L	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-22 R1	**Lab ID:**	1607863-12
Collection Date:	7/23/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**280**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client: ALS Environmental
Project: L1803696 **Work Order:** 1607863
Sample ID: L1803696-23 R2 **Lab ID:** 1607863-13
Collection Date: 7/23/2016 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**150**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client: ALS Environmental
Project: L1803696 **Work Order:** 1607863
Sample ID: L1803696-24 R8 **Lab ID:** 1607863-14
Collection Date: 7/23/2016 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**6.3**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-25 R9	**Lab ID:**	1607863-15
Collection Date:	7/23/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**400**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: *04-Aug-16*

Client:	ALS Environmental		
Project:	L1803696	**Work Order:**	1607863
Sample ID:	L1803696-26 SL	**Lab ID:**	1607863-16
Collection Date:	7/24/2016	**Matrix:**	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**6.4**		**2.5**	**mg/L**	1	7/29/2016

Note:

ALS Environmental

Date: 04-Aug-16

Client: ALS Environmental
Project: L1803696
WorkOrder: **1607863**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
%	
mg/L	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-VANCOUVER** Date/Time Received: **28-Jul-16 11:40**

Work Order: **1607863** Received by: **RDN**

Checklist completed by: L eeanna F ischer 28-Jul-16 Reviewed by: S hawn S mythe 01-Aug-16

eSignature | Date | eSignature | Date

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	8.4		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Contact: Brent Mack
Company: ALS Environmental
Address: 8081 Lougheed HWY, Suite 100
Burnaby, BC V5A1W9

REFERENCE DATA

Project / Location: L1803696
PO Number: L1803696
ALS Work Order: 1607863

TEM Water Narrative: Analysis performed on FEI Tecnai TEM with integrated EDXA capabilities. Morphology, EDXA, and SAED measurements used to determine fiber species. Representative EDXA spectra of each asbestos type detected included. Compliance samples must be received and filtered within 48 hours of collection. Collection is performed outside ALS and is the responsibility of the client. Samples disposed after 60 days. TEM grids archived 3 years. Results apply only to portions analyzed.

TEM Water Methods: "EPA 100.2" refers to drinking water samples filtered on 47mm, 0.22µm pore MCE filters. "EPA 100.1" refers to drinking water samples filtered on 47mm, 0.1µm pore Polycarbonate filters. No standard method for asbestos in nonpotable water exists. All TEM waters (potable and nonpotable) analyzed at >10,000x magnification for asbestos fibers >10µm long. Whenever possible, sufficient volume is analyzed to yield an AS of <0.20 MFL based on the detection of 1 confirmed asbestos fiber in the total area analyzed. However, the volume analyzed is dependent upon a filter loading of <25% particulate. Samples containing excessive suspended solids may not reach the recommended AS of <0.20 MFL. In any case, a minimum of 4 and a maximum of 10 openings are analyzed regardless of the AS reached or asbestos concentration detected. ALS will report results directly to state of origin only when;

a) the Chain of Custody clearly states "drinking water for state compliance",
b) the appropriate state drinking water form is submitted with the samples,
c) the state form is completely filled out by the client prior to submittal, and
d) the address to which the form is to be sent is provided.

NOTES: *NA=Not Applicable, ND=None Detected, AS=Analytical Sensitivity, MFL=Millions of Fibers per Liter. † Act-Tremolite concentrations include Actinolite as well as the Libby Amphiboles; Tremolite, Winchite, & Richterite.*

OH Lab ID: #4077, Ohio Analysts; P. Johnson #2268, A. Sohn #3431

PA Lab ID: #68-01320, Cert. #003

NELAC accredited through New York ELAP, LAB #11371

TEM ANALYSIS DATA

EDXA Resolution (eV): <175
Accelerating Voltage (keV): 100
Prep Start Date: 7/29/2016
Calibration Constant (µm/cm): 0.74
Camera Constant (mm-Å): 129.25
Analysis Start Date: 8/1/2016

Pamela Johnson
ALS TEM Analyst

Shawn Smythe
ALS Project Manager

IDENTIFICATION

Client Sample ID:	L1803696-6 E2	L1803696-22 R1
ALS Sample ID:	1607863-04	1607863-12
Method:	EPA 100.2	EPA 100.2
Date of Collection:	7/21/2016	7/23/2016
Time of Collection:	11:40	11:40

FILTRATION & ANALYSIS

Date of Filtration:	7/29/2016	7/29/2016
Time of Filtration:	10:00	10:00
Volume Filtered (L):	0.02	0.001
Openings Analyzed:	10	10
Avg. Opening Area (mm^2):	0.0108	0.0108
AS (MFL):	0.50	9.95

ASBESTOS COUNT

Chrysotile:	2	0
Amosite:	0	0
Crocidolite:	0	0
Act-Tremolite†:	0	0
Anthophyllite:	0	0
Total Asbestos:	2	0

ASBESTOS CONCENTRATION (MFL)

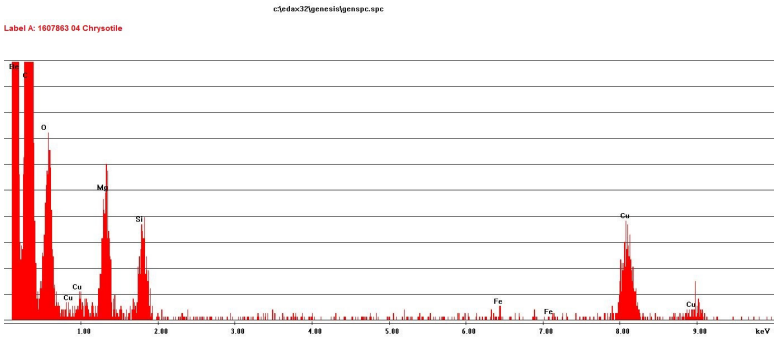
Chrysotile:	1.00	<AS
Amosite:	<AS	<AS
Crocidolite:	<AS	<AS
Act-Tremolite†:	<AS	<AS
Anthophyllite:	<AS	<AS
Total Asbestos:	**1.00**	**<AS**

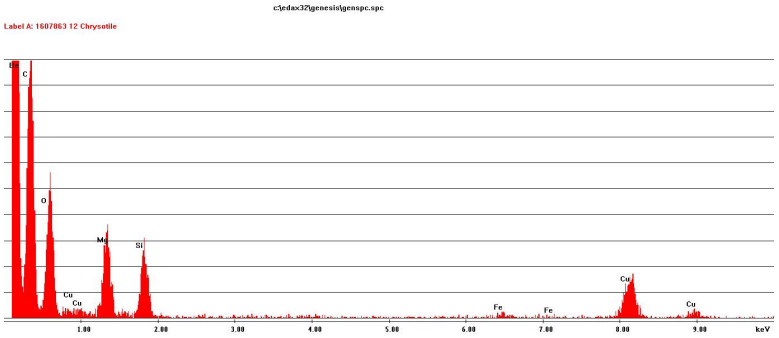
NOTES

Both samples contained an extremely high concentration of suspended solids, primarily organic material, which prohibited filtration of sufficient volume to reach the method recommended AS of <0.20 MFL. In addition, both samples contained chrysotile asbestos fibers that were too short to be counted by this method.

EDXA SPECTRA

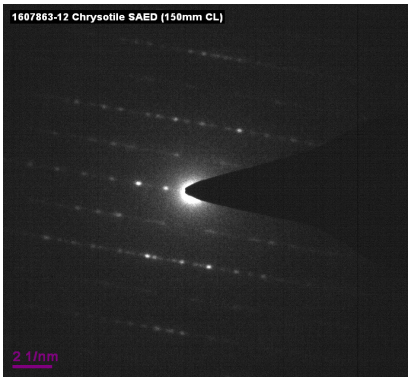
NOTE: Spurious peaks may originate from low background sample holder, column pole pieces, TEM grids, prep solutions or matrix materials.





PHOTOMICROGRAPHS

Collected using Gatan Digital Micrograph.



ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1803696-COFC

Report To	
Company:	Hemmera Environchem Inc.
Contact:	Natasha Sandys
Address:	230 - 2237 2nd Avenue Whitehorse, YT
Phone:	867-456-4865

Report Format / D

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ Yes ☐ No

☐ Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax nsandys@hemmera.com

Email 2 chris@elr.ca

sh Turnaround Time (TAT) is not available for all tests)

R ☑ Regular (Standard TAT if received by 3 pm - business days)

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

E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT

E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge

Specify Date Required for E2,E or P:

Invoice To	
Same as Report To	☑ Yes ☐ No
Copy of Invoice with Report	☐ Yes ☑ No
Company:	Hemmera Environchem Inc.
Contact:	Natasha Sandys

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX

Email 1 or Fax nsandys@hemmera.com

Email 2 chris@elr.ca

Project Information

ALS Quote #:	Q56044
Job #:	1343-005.17
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

Approver ID:	Cost Center:
GL Account:	Routing Code:
Activity Code:	
Location:	

ALS Lab Work Order # (lab use only)

ALS Contact: **Sampler:** AN/CH

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Diss. Met (incl. Hg) and Hardness	Low Level Tot. Met (incl. Hg) and Hardness	Chromium Speciation (III/VI) - Total	Chromium Speciation (III/VI) - Dissolved	Ammonia - N	Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity	Asbestos-TEM-AD	Total Suspended solids	Number of Containers
					F/P	P	P	F/P	P	F/P								
	E1	22-Jul-16	10:10	Water	R	R			R	R							R	9
	E1	24-Jul-16	11;50	Water							R	R	R	R	R			1
	E1(H)	22-Jul-16	10:45	Water	R	R			R	R							R	9
	E1(H)	24-Jul-16	11:10	Water							R	R	R	R	R			1
	Travel Blank			Water		R			R	R	R	R	R	R	R		R	7
	E2	21-Jul-16	17:15	Water	R	R			R	R						R	R	10
	E2	24-Jul-16	12:10	Water							R	R	R	R	R			1
	E4	21-Jul-16	15:15	Water	R	R			R	R							R	9
	E4	24-Jul-16	12:40	Water							R	R	R	R	R			1
	E7	22-Jul-16	15:15	Water	R	R			R	R							R	9
	E7	24-Jul-16	13:10	Water							R	R	R	R	R			1
	E8	22-Jul-16	17:10	Water	R	R			R	R							R	9

Short Holding Time

Rush Processing

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ Yes ☑ No

Are samples for human drinking water use?
☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐		SIF Observations	Yes ☐ No ☐
Ice packs Yes ☑	No ☐	Custody seal intact	Yes ☐ No ☐
Cooling Initiated ☑			

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C
1.0	1.0	3.0	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date: 26-Jul-16	Time: 10:15	Received by: Sarah	Date: July 27	Time: 11:35

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

8/4°C

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1803696-COFC

COC Number: 1

Report To		Report Format		(Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.18	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F/P Low Level Diss. Met (incl. Hg) and Hardness	P Low Level Tot. Met (incl. Hg) and Hardness	P Chromium Speciation (III/VI) - Total	F/P Chromium Speciation (III/VI) - Dissolved	P Ammonia - N	F/P Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids	Asbestos-TEM-AD	Total Suspended Solids (TSS)	Number of Containers
	E8	24-Jul-16	13:00	Water							R	R	R	R	R			1
	R4	21-Jul-16	13:45	Water	R	R			R	R							R	9
	R4	24-Jul-16	12:45	Water							R	R	R	R	R			1
	R6	22-Jul-16	18:20	Water	R	R			R	R							R	9
	R6	24-Jul-16	13:30	Water							R	R	R	R	R			1
	GWCC-5	22-Jul-16	8:30	Water	R	R			R	R							R	9
	GWCC-5	24-Jul-16	12:00	Water							R	R	R	R	R			1
	Dup 2	22-Jul-16	8:30	Water	R	R			R	R							R	9
	Dup 2	24-Jul-16	12:00	Water							R	R	R	R	R			1
	R1	23-Jul-16	14:05	Water	R	R			R	R	R	R	R	R	R	R	R	11
	R2	23-Jul-16	15:55	Water	R	R			R	R	R	R	R	R	R		R	10
	R8	23-Jul-16	17:15	Water	R	R			R	R	R	R	R	R	R		R	10

Short Holding Time
Rush Processing

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐
Ice packs	Yes ☑	No ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☐			

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				27	11:35			

8/4°C

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.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1803696-COFC

COC Number: 1

Page 3 of 3

Report To		Report Format / Distribution		Rush Turnaround Time (TAT) is not available for all tests
Company:	Hemmera Environchem Inc.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.18	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F/P Low Level Diss. Met (incl. Hg) and Hardness	P Low Level Tot. Met (incl. Hg) and Hardness	P Chromium Speciation (III/VI) - Total	F/P Chromium Speciation (III/VI) - Dissolved	P Ammonia - N	F/P Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids	Asbestos-TEM-AD	Total Suspended Solids (TSS)	Number of Containers
	R9	23-Jul-16	18:15	Water	R	R			R	R	R	R	R	R	R		R	10
	SL	24-Jul-16	8:50	Water	R	R			R	R	R	R	R	R	R		R	10
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

Short Holding Time
Rush Processing

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				July 27	11:35			

8/4°C

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.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

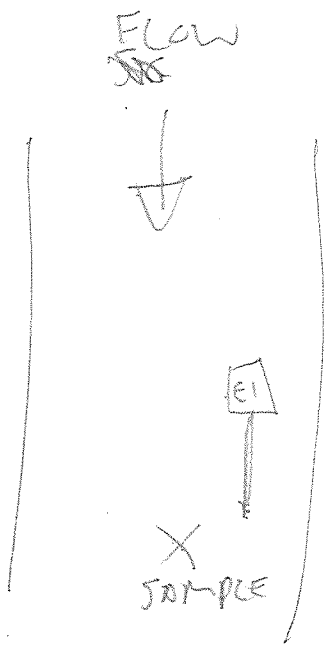
APPENDIX 2
Water Quality Field Forms

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E1	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2016
UTM Coordinates	Z 7 E 0513649 N 7147109	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GPSMAP Name E1	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~15°C RAIN. 100% cloud
Photos	Cam GPSMAP Nos. 6867 - 6869				
Sample Time (24h)	~~10:10~~ 10-10				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD.
Sample Depth (m)	0.1
Temperature (°C)	14.4
pH (pH Units)	8.3
Cond. (µs/cm)	398.4
Specific Cond. (µs/cm)	499.8
Redox (mV)	156.4
DO (mg/L)	8.86
DO (%)	86.9
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	SLIGHTLY TURBID NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 10-10 *
Sample Time	(hh:mm) 10-10
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

* HAD TO RESET DATE + TIME ON YSI

Sample Site (Con't): E1

Sample Date (Con't): JULY 22 2016

Sample Time (Con't): 10-10

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 24/7/2016 @ 1150
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

RAINING!

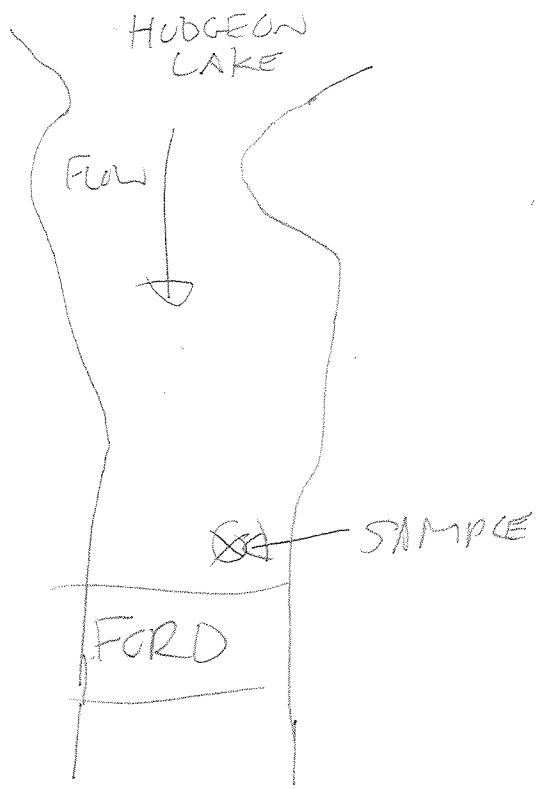
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E1(H)	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2016
UTM Coordinates	Z 7W E 0512851 N 7147433	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name E1H	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~11°C RAIN. 100% CLOUD.
Photos	Cam GMR Nos. 6870-6875				
Sample Time (24h)	10-45				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD (RAINING)
Sample Depth (m)	0.1
Temperature (°C)	14.3
pH (pH Units)	8.04
Cond. (µs/cm)	399.0
Specific Cond. (µs/cm)	501.4
Redox (mV)	158.6
DO (mg/L)	8.51
DO (%)	83.6
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	V. SLIGHTLY TURBID. NO ODOUR

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1042
Sample Time	(hh:mm) 10-45
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Site Sketch



Sample Site (Con't): E1(H)

Sample Date (Con't): JULY 22 2016

Sample Time (Con't): 10-45.

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 24 2016 1110
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 22 10-45
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒		
				Total:	9 10	

General Notes:

RAINING. GEN CHEM TO BE COLLECTED. ✓

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E2	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 21 2016
UTM Coordinates	Z 07W E 0514165 N 7147076	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS Garmin Name E2	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~14°C OVERCAST.
Photos	Cam GARMIN Nos. 6856-6856				
Sample Time (24h)	1715				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

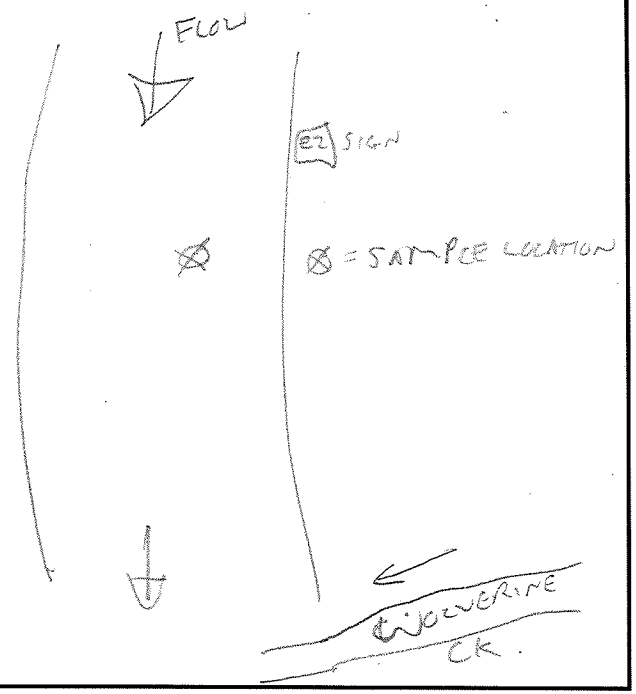
Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD.
Sample Depth (m)	0.1
Temperature (°C)	14.4
pH (pH Units)	6.9 (PEN) YSI 8.11
Cond. (µs/cm)	501
Specific Cond. (µs/cm)	629
Redox (mV)	146.0
DO (mg/L)	8.13
DO (%)	79.2
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR. NO ODOUR.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1716
Sample Time	(hh:mm) 1715
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

pH.

Site Sketch

NOTE: HAS BEEN RAINING MOST OF THE DAY. STOPPED AROUND 1545.



Sample Site (Con't): E2

Sample Date (Con't): JULY 21 2016

Sample Time (Con't): 1715

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 24/7/2016 1210
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☒	1	
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

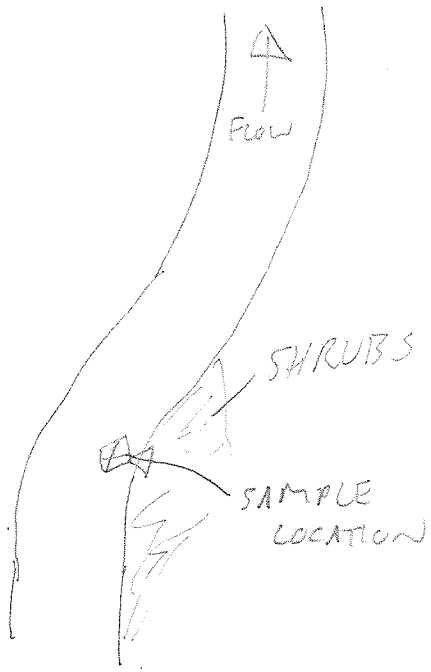
General Notes: GEN CHEM TO BE COLLECTED. ✓

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E3	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z 7W E 0514078 N 7147190	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GRR Name E3	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	LIGHT RAIN. ~15°C
Photos	Cam GRR Nos. 6809 - 6811				
Sample Time (24h)	0805.				
Field Blank Collected:	☒ Yes ☐ No Name FB1 No asbestos	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD.
Sample Depth (m)	0.1.
Temperature (°C)	8.2
pH (pH Units)	8.14
Cond. (µs/cm)	557
Specific Cond. (µs/cm)	825
Redox (mV)	364.4
DO (mg/L)	10.92
DO (%)	93.2
Turbidity (NTU)	SLIGHTLY TURBID
Appearance & Odour (Clear, Silty, HC odours, etc.)	↓

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 0813
Sample Time	(hh:mm) 0805
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): EB.

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 0805

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 20 0805
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☒	1	
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	11	

General Notes:

INCLUDES FB1 WITH NO ASBESTOS. ~~SAMPLE~~ ~~FB~~.

SURFACE WATER SAMPLE COLLECTION SHEET

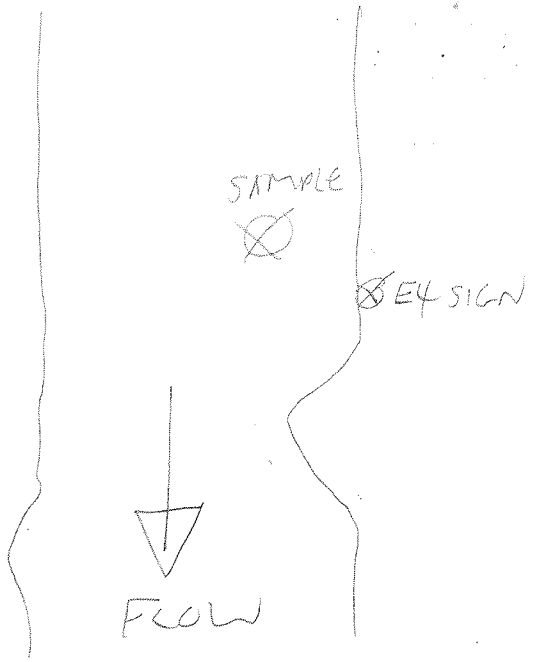
Sample Site:	E4	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 21 2016
UTM Coordinates	Z 07W E 0515945 N 7145287	**Client:**	Yukon Government (AAM)	**Samplers:**	GMK + NB
Waypoint	GPS GMK Name E4	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	LIGHT RAIN 14°C
Photos	Cam GMK Nos. 6851-6855				
Sample Time (24h)	1515				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.1
Temperature (°C)	13.0
pH (pH Units)	6.8
Cond. (µs/cm)	532
Specific Cond. (µs/cm)	690
Redox (mV)	146.2
DO (mg/L)	9.17
DO (%)	87.2
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1517
Sample Time	(hh:mm) 1515
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

PH

Site Sketch



Sample Site (Con't): E4

Sample Date (Con't): JULY 21 2016

Sample Time (Con't): 1515

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 21/7/2016 1240 *
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

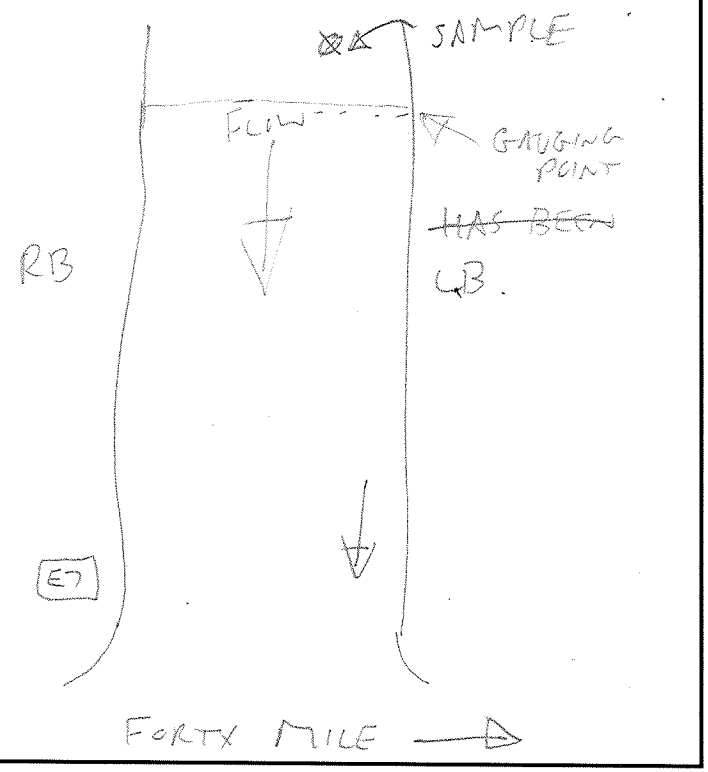
GEN CHEM TO BE COLLECTED ✓

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E7	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2016
UTM Coordinates	Z 07W E 0519362 N 7142041	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~ 14°C LIGHT RAIN! (VARIABLE RAIN)
Photos	Cam GMR Nos. 6893 - 6898				
Sample Time (24h)	1515.				
Field Blank Collected:	☐ Yes ☒ No Name	**Duplicate Collected:**	☐ Yes ☒ No Name		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD BUT CREEK FLOODED BANK TO BANK AND TURBID VISIBLE SILT.
Sample Depth (m)	0-1
Temperature (°C)	11.7
pH (pH Units)	8.06
Cond. (µs/cm)	496.1
Specific Cond. (µs/cm)	671
Redox (mV)	134.7
DO (mg/L)	9.40
DO (%)	87.5
Turbidity (NTU)	TURBID.
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWN! NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1530.
Sample Time	(hh:mm) 1515.
Unit Used	☒ Pro Plus ☐ Pen Unit Other

Sample Site (Con't): E7

Sample Date (Con't): JULY 22 2016

Sample Time (Con't): 1515

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 24/7/2016 1310
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 22 2016
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~		☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	9 10	

General Notes:

SAMPLE COLLECTED ~ 25 m UPSTREAM OF E7 SIGN. RIVER/CK FLOWED BANK TO BANK. WANTED TO AVOID INFLUENCE OF 40 MILE RIVER & SOFT SUBSTRATE WHERE CREEK USED TO BE (STABILITY/SAFETY). HAS BEEN RAINING EVERY DAY WHILE ON SITE.

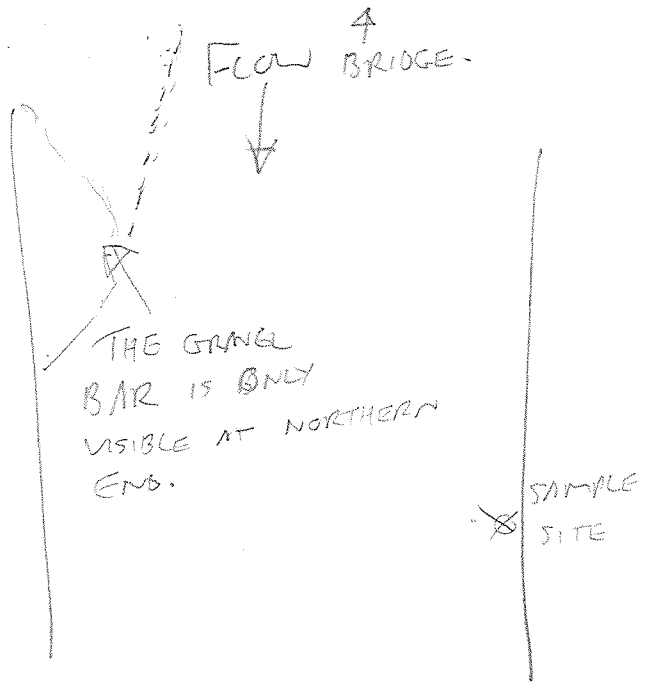
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E8	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2016
UTM Coordinates	Z 07W E 0519457 N 7142789	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GNNR Name E8	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	16°C. CLOUDY OCCASIONAL RAIN
Photos	Cam GNNR Nos. 6900 - 6902				
Sample Time (24h)	1710				
Field Blank Collected:	☐ Yes ☒ No Name	**Duplicate Collected:**	☐ Yes ☒ No Name		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. 40 MILE IS HIGH!
Sample Depth (m)	0.1
Temperature (°C)	10.5
pH (pH Units)	7.89
Cond. (µs/cm)	118.5
Specific Cond. (µs/cm)	163.8
Redox (mV)	96.7
DO (mg/L)	10.31
DO (%)	92.5
Turbidity (NTU)	TURBID.
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWN RIVER NO ODOUR

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1709
Sample Time	(hh:mm) 1710
Unit Used	☒ Pro Plus ☐ Pen Unit Other

Site Sketch



Sample Site (Con't): E8

Sample Date (Con't): JULY 22 2016

Sample Time (Con't): 1710

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 24/7/2016 1300
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 22 2016
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

GEN CHEM TO BE COLLECTED. ✓

LOTS OF RAIN OVER LAST FOUR DAYS (AT LEAST). RIVERS ARE HIGH. LOWER CC + FORTY MILE ARE BROWN (TURBID)

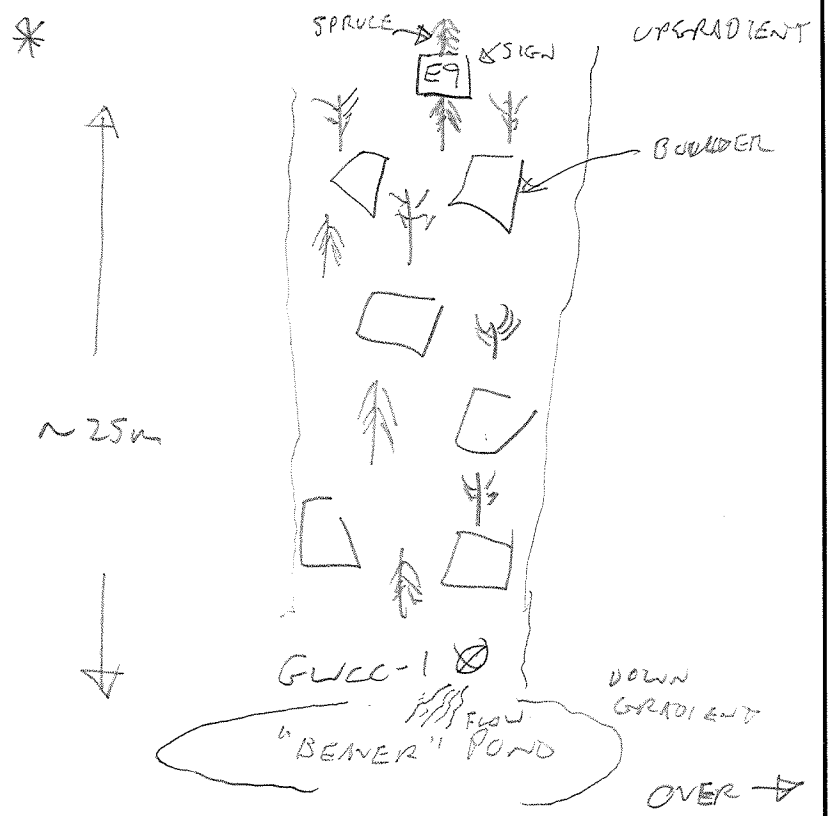
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E9	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 26 2016
UTM Coordinates	Z 07W E 0513893 N 7146931	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name E9	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~18°C SOME CLOUD NO PRECIP.
Photos	Cam GMR Nos.				
Sample Time (24h)	DRY *				
Field Blank Collected:	☐ Yes ☒ No Name	**Duplicate Collected:**	☐ Yes ☒ No Name		

Field Parameter Measurements (note units if different than those stated)	
Station Status	DRY *
Sample Depth (m)	
Temperature (°C)	
pH (pH Units)	
Cond. (µs/cm)	
Specific Cond. (µs/cm)	
Redox (mV)	
DO (mg/L)	
DO (%)	
Turbidity (NTU)	
Appearance & Odour (Clear, Silty, HC odours, etc.)	

Field Measurements Log	
YSI Logged?	☐ Yes ☒ No
Time Logged on YSI	(hh:mm) N/A
Sample Time	(hh:mm) N/A
Unit Used	☐ Pro Plus ☐ Pen Unit Other

Site Sketch



Sample Site (Con't): EQ

Sample Date (Con't): JULY 24 2016 @ 1210

Sample Time (Con't): \ DRY

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☐		Date/Time:
125 ml (plastic)	Total Metals	-	☐ Nitric Acid	☐		Date/Time:
125 ml (plastic)	Dissolved Metals	☐ Field Filtered	☐ Nitric Acid	☐		
40 ml (glass)	Total Mercury		☐ Hydrochloric Acid	☐		
40 ml (glass)	Dissolved Mercury	☐ Field Filtered	☐ Hydrochloric Acid	☐		
125 ml (amber)	Ammonia (NH3)		☐ Sulfuric Acid	☐		DRY
125 ml (amber)	Dissolved Organic Carbon (DOC)	☐ Field Filtered	☐ Sulfuric Acid	☐		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☐ NaOH	☐		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☐ Field Filtered	☐ NaOH	☐		
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☐		
				Total:		

General Notes:

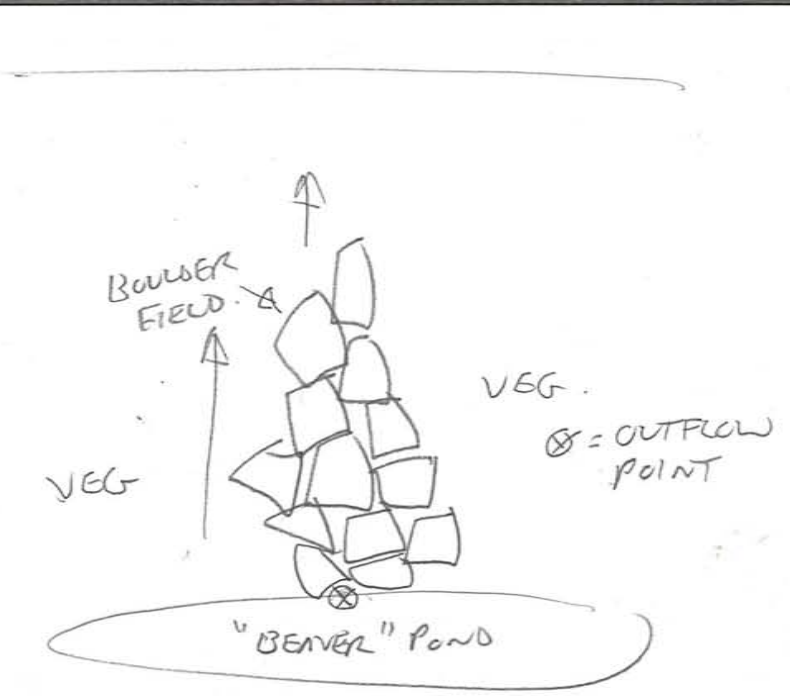
EQ appears to be a constructed rock/French drain which now has a lot of vegetation growing through it and on it. No surface water observed. Given the flow downgradient at GWCC-1 there is likely ~~then~~ ~~is~~ gw flow at EQ. GW connection between EQ and SL is very likely.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-1	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z 7W E 0513903 N 7146956	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name GWCC1	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~17°C OVERCAST Some BLUE SKY
Photos	Cam GMR Nos. 6836 - 6839				
Sample Time (24h)	1715				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	~~0.2~~ FROM OUTFLOW ~0.1
Temperature (°C)	4.2
pH (pH Units)	7.40
Cond. (µs/cm)	1374
Specific Cond. (µs/cm)	2282
Redox (mV)	241
DO (mg/L)	4.29
DO (%)	33.1
Turbidity (NTU)	CLEAR
Appearance & Odour (Clear, Silty, HC odours, etc.)	SLIGHT SULPHUR SMELL FROM GENERAL SITE BUT NOT FROM THE WATER.

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1714
Sample Time	(hh:mm) 1715
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

COND. 2.17 M/S
USE YSI READING. PEN NOT CALIBRATED.

Sample Site (Con't): GWCC-1

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 1715

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 20 2016
125 ml (plastic)	Total Metals	-	☐ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☐ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☐ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☐ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☐ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☐ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☐ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☐ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	~~-~~	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes: WADERS FOR THIS SITE. USEFUL - DEEP NEARBY.

SURFACE WATER SAMPLE COLLECTION SHEET

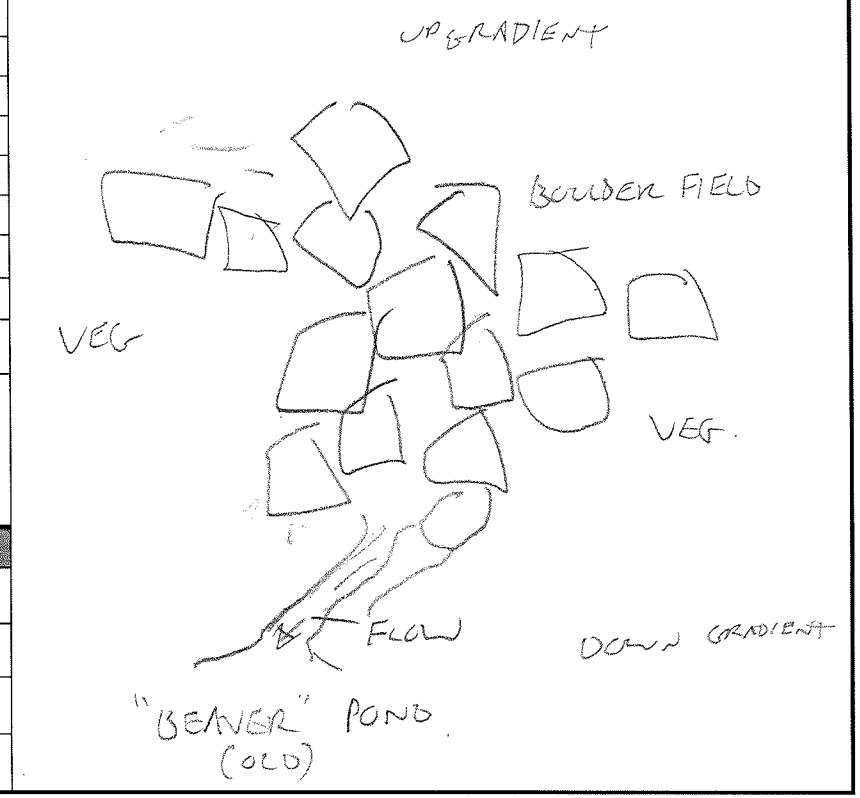
Sample Site:	GWCC-2	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z 7 E 0513901 N 7146968	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name GWCC-2	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~17°C
Photos	Cam GMR Nos. 6831-1835				
Sample Time (24h)	1650				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	FROM DAYLIGHTING WATER
Temperature (°C)	7.6
pH (pH Units)	7.62
Cond. (µs/cm)	1045 (1848 µS PEN)
Specific Cond. (µs/cm)	1564
Redox (mV)	198.8
DO (mg/L)	7.26
DO (%)	61.0
Turbidity (NTU)	CLEAR
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR. NO ODOUR

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1659
Sample Time	(hh:mm) 1650
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

COND. USE YSI READING. PEN NOT CALIBRATED.

Site Sketch



Sample Site (Con't): GWCC-2

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 1650

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 20 1650
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☐	1	
				Total:	10	

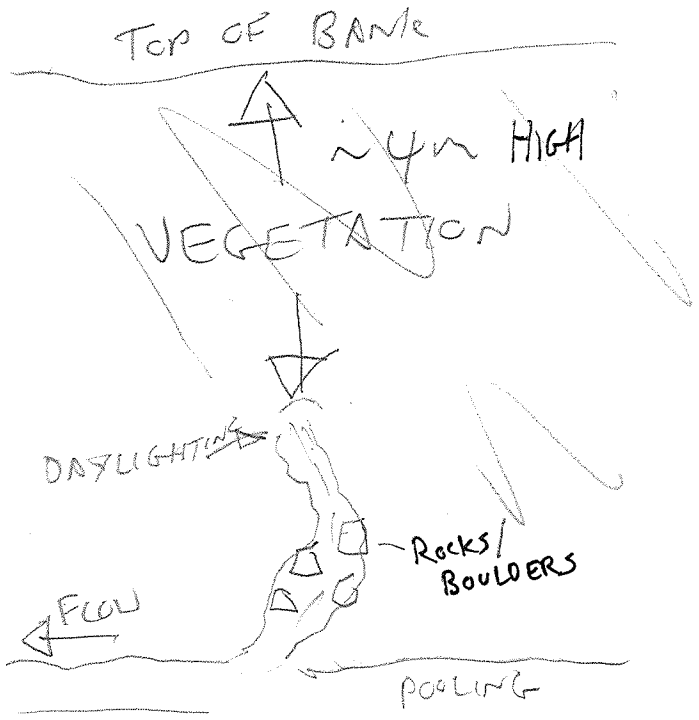
General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-3	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z 07W E 0513882 N 7147038	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GPSR Name ~~DUP1~~ GWCC3	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~17°C OVERCAST
Photos	Cam GPSR Nos. 6826 - 6830				
Sample Time (24h)	1615				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☒ Yes ☐ No Name DUP 1		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	FLOW FLOWING SEEP
Temperature (°C)	10.9
pH (pH Units)	7.48
Cond. (µs/cm)	690 (1123µS PEN)
Specific Cond. (µs/cm)	945
Redox (mV)	155.9
DO (mg/L)	4.24
DO (%)	38.5
Turbidity (NTU)	CLEAR
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR, NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1625
Sample Time	(hh:mm) 1615
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

COND. USE YSI READING. PEN NOT CALIBRATED.

Sample Site (Con't): GWCC-3

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 1615

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: DUP 1 BOTTLES 1
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: 1
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☐ Nitric Acid	☒	1	1
40 ml (glass)	Total Mercury		☐ Hydrochloric Acid	☒	1	1
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☐ Hydrochloric Acid	☒	1	1
125 ml (amber)	Ammonia (NH3)		☐ Sulfuric Acid	☒	1	1
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☐ Sulfuric Acid	☒	1	1
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☐ NaOH	☒	1	1
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☐ NaOH	☒	1	1
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☒		
500 ml (plastic)	TSS	-	-	☒	1	1
				Total:	10	10

General Notes:

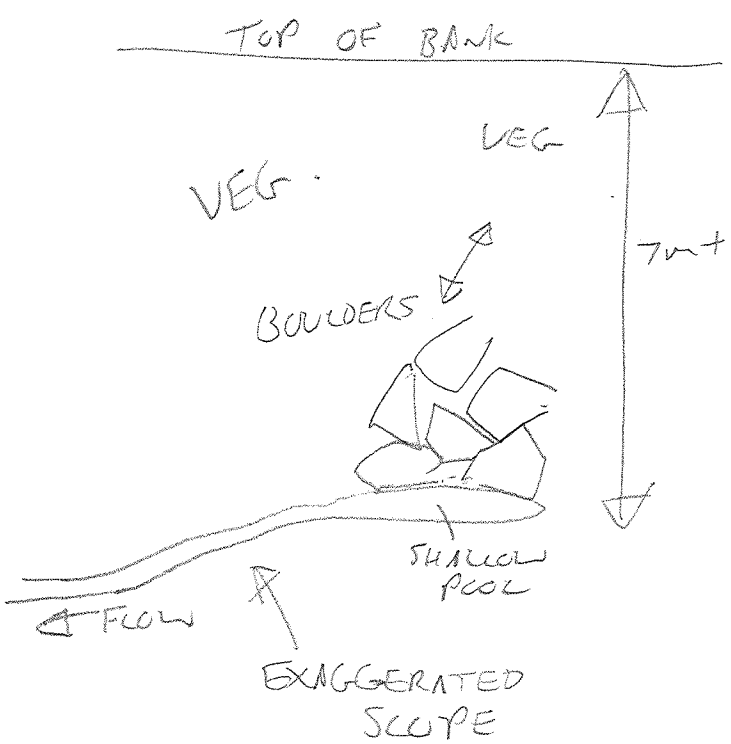
SAMPLE COLLECTED FROM WATER FLOWING FROM BANK, NOT FROM BELOW THE SEEP.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-4	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z 07W E 0513874 N 7147058	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS Garmin Name GWCC4	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~17°C OVERCAST SOME BLUE SKY.
Photos	Cam Garmin Nos. 6840 - 6843				
Sample Time (24h)	1745				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	OK. WATER IS LOW
Sample Depth (m)	0.05
Temperature (°C)	11.6
pH (pH Units)	7.49
Cond. (µs/cm)	559 / PEN = 885 uS
Specific Cond. (µs/cm)	751
Redox (mV)	200.8
DO (mg/L)	2.20
DO (%)	20.3
Turbidity (NTU)	CLEAR
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR. NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1745
Sample Time	(hh:mm) 1745
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

COND. USE YSI READINGS. PEN NOT CALIBRATED.

Sample Site (Con't): GW CC-4

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 1745

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 20 2016
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~		☐		
500 ml (plastic)	TSS	-	-	☒	~~10~~ 1	
				Total:	10	

General Notes:

POOL FOR SAMPLING IS V. SHALLOW ~5-8cm DEEP.

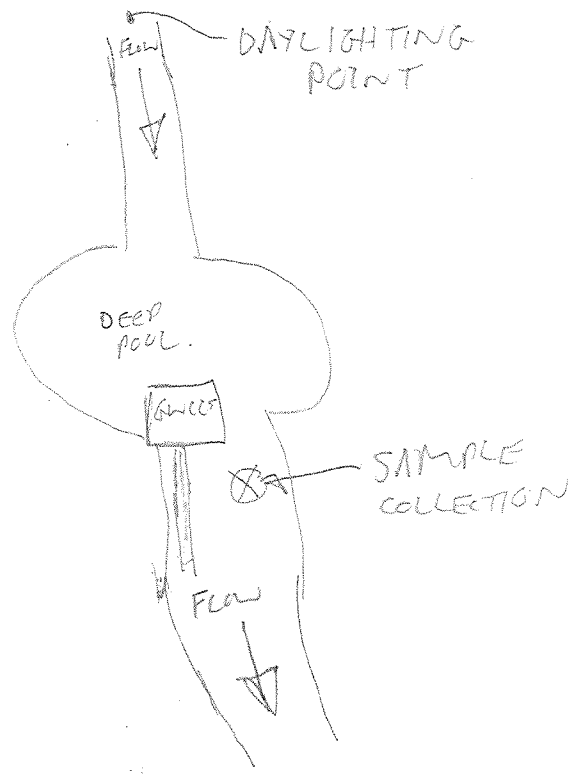
WATER IS NOT GUSHING FROM THE ROCKS.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-5	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2014
UTM Coordinates	Z 07W E 0513983 N 7147127	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name GWCC5	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~13°C
Photos	Cam GMR Nos. 6861 - 6864				RAIN.
Sample Time (24h)	0830				~~OVER~~ 100% CLOUD
Field Blank Collected:	☐ Yes ☒ No Name	**Duplicate Collected:**	☒ Yes ☐ No Name DUP 2		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD LOTS OF ALGAL GROWTH.
Sample Depth (m)	0-05 SHALLOW WATER
Temperature (°C)	9.1
pH (pH Units)	7.51
Cond. (µs/cm)	629
Specific Cond. (µs/cm)	903
Redox (mV)	111.3
DO (mg/L)	3.93
DO (%)	34.2
Turbidity (NTU)	~
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR.

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 0837
Sample Time	(hh:mm) 0830
Unit Used	☒ Pro Plus ☐ Pen Unit Other

Sample Site (Con't): GWCC-5

Sample Date (Con't): JULY 22 2015

Sample Time (Con't): 0830

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒ X	1	Date/Time: 24/7/2016 1200
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 22 2016 0830
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	DUP2 10 BOTTLES. ✱
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	~~-~~	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

GEN CHEM OF SAMPLE AND DUPLICATE TO BE COLLECTED. ✓

✱ GEN CHEM OF DUP 2 COLLECTED 24/7/2016 @ 1200

~~10 TOTAL~~ 10 BOTTLES TOTAL FOR DUP 2.

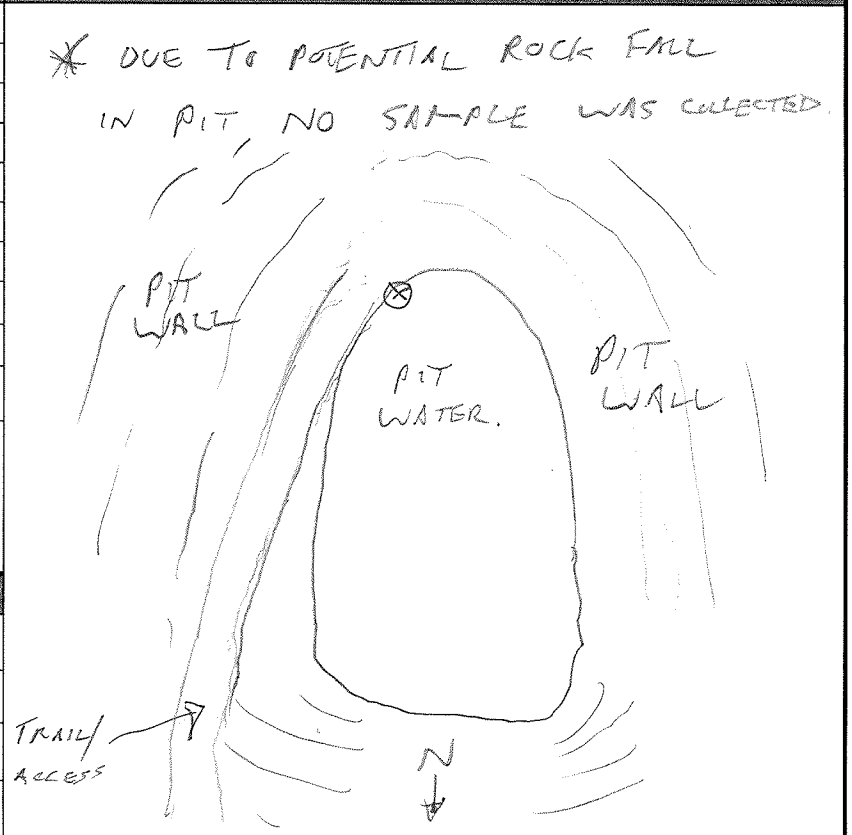
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	PL *	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 24 2016
UTM Coordinates	Z __ E _____ N _____	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS _____ Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	N 18°C PART CLOUDY NO PRECIP.
Photos	Cam _____ Nos. _____				
Sample Time (24h)	N/A *				
Field Blank Collected:	☐ Yes ☐ No Name _____	**Duplicate Collected:**	☐ Yes ☐ No Name N/A		

Field Parameter Measurements (note units if different than those stated)	
Station Status	
Sample Depth (m)	
Temperature (°C)	
pH (pH Units)	
Cond. (µs/cm)	
Specific Cond. (µs/cm)	
Redox (mV)	
DO (mg/L)	
DO (%)	
Turbidity (NTU)	
Appearance & Odour (Clear, Silty, HC odours, etc.)	

Field Measurements Log	
YSI Logged?	☐ Yes ☐ No
Time Logged on YSI	(hh:mm) _____
Sample Time	(hh:mm) _____
Unit Used	☐ Pro Plus ☐ Pen Unit Other _____

Site Sketch



⊗ = EASIEST ACCESS POINT TO WATER BUT ALSO VERY HAZARDOUS.

Sample Site (Con't): JULY 24 2016 *

Sample Date (Con't): PL

Sample Time (Con't): N/A *

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☐		Date/Time:
125 ml (plastic)	Total Metals	-	☐ Nitric Acid	☐		Date/Time:
125 ml (plastic)	Dissolved Metals	☐ Field Filtered	☐ Nitric Acid	☐		
40 ml (glass)	Total Mercury		☐ Hydrochloric Acid	☐		
40 ml (glass)	Dissolved Mercury	☐ Field Filtered	☐ Hydrochloric Acid	☐		
125 ml (amber)	Ammonia (NH3)		☐ Sulfuric Acid	☐		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☐ Field Filtered	☐ Sulfuric Acid	☐		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☐ NaOH	☐		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☐ Field Filtered	☐ NaOH	☐		
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☐		
				Total:		

General Notes:

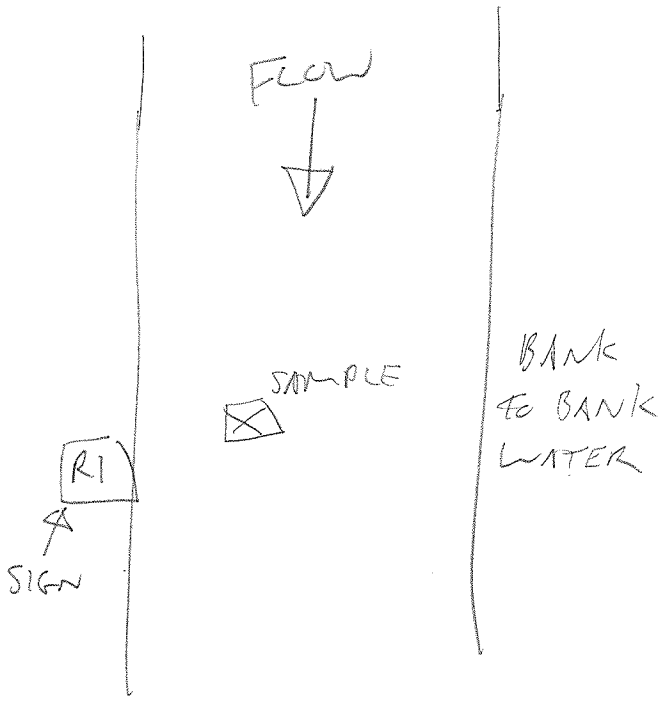
* UNSAFE TO ACCESS BECAUSE OF POTENTIAL ROCK FALL.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R1	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 23 2016.
UTM Coordinates	Z 7TV E 0510597 N 7147500	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GRMR Name R1	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~19°C PART CLOUD.
Photos	Cam GRMR Nos. 6915 - 6919.				
Sample Time (24h)	1405				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. VERY HIGH WATER
Sample Depth (m)	0.1
Temperature (°C)	6.0
pH (pH Units)	7.88
Cond. (µs/cm)	243.1
Specific Cond. (µs/cm)	380.9
Redox (mV)	53.6
DO (mg/L)	11.40
DO (%)	91.8.
Turbidity (NTU)	TURBID BROWN
Appearance & Odour (Clear, Silty, HC odours, etc.)	NO ODOUR.

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1404
Sample Time	(hh:mm) 1405
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): R1

Sample Date (Con't): JULY 23 2016

Sample Time (Con't): 14-05

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 23 2016
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☒	1	
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	11	

General Notes:

WATER. IS TURBID - BROWN.

A LOT OF RAIN OVER PREVIOUS 4 DAYS!

FULL SAMPLE TODAY. INCL GEN CHEM.

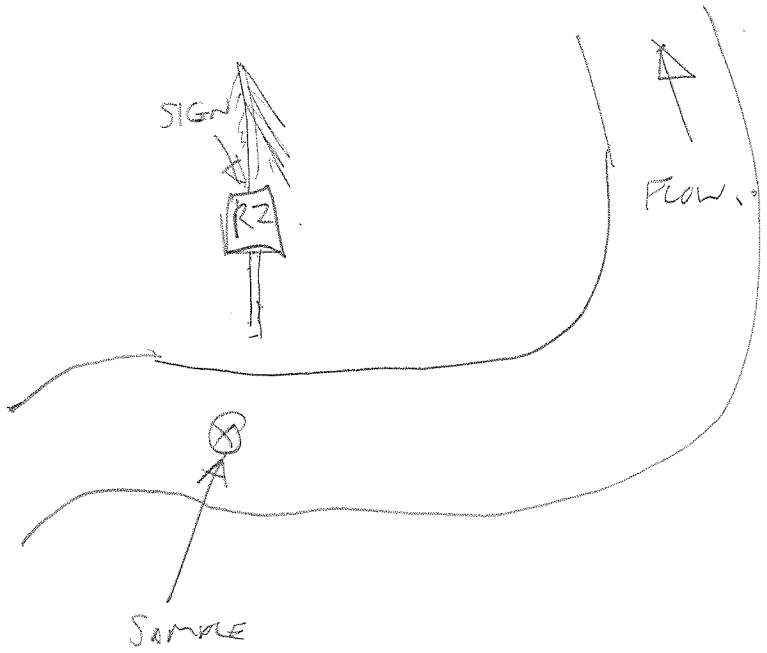
SURFACE WATER SAMPLE COLLECTION SHEET

1343-005.19

Sample Site:	RZ	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	July 23 2016
UTM Coordinates	Z 07W E 0517033 N 7148063	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name RZ	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	19°C PART CLOUD. NO PRECIP
Photos	Cam GMR Nos. 6920 - 6923				
Sample Time (24h)	1555				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. WATER TURBID
Sample Depth (m)	0.1
Temperature (°C)	8.2
pH (pH Units)	7.99
Cond. (µs/cm)	265.7
Specific Cond. (µs/cm)	391.2
Redox (mV)	44.3
DO (mg/L)	10.93
DO (%)	92.9
Turbidity (NTU)	TURBID. BROWN
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWN. CAN'T SEE BOTTOM

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1559
Sample Time	(hh:mm) 1555
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): R2

Sample Date (Con't): JULY 23 2016

Sample Time (Con't): 1555

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 23
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

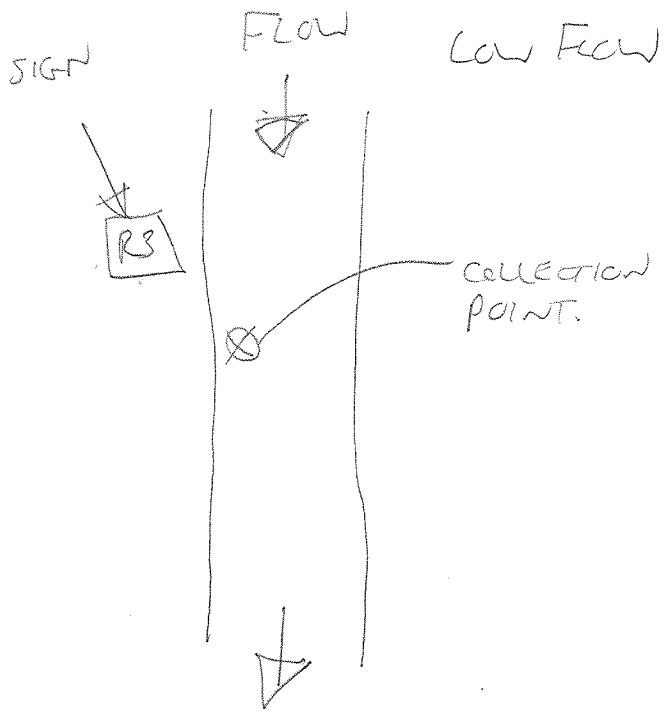
FULL SAMPLE. WATER V. BROWN (TURBID) RECENT RAIN FOR FOUR DAYS! WATER LEVEL IS HIGH.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R3	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 19 2016
UTM Coordinates	Z 7W E 0513950 N 7148678	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GPSR Name R3	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~16°C OVERCAST
Photos	Cam GPSR Nos. 6802-6805				
Sample Time (24h)	16:50				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. SOME TURBIDITY
Sample Depth (m)	0.1
Temperature (°C)	7.7°C
pH (pH Units)	8.28
Cond. (µs/cm)	546
Specific Cond. (µs/cm)	814
Redox (mV)	176.5
DO (mg/L)	12.36
DO (%)	103.9 (?) ↕ HIGH?
Turbidity (NTU)	SLIGHTY TURBID.
Appearance & Odour (Clear, Silty, HC odours, etc.)	NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1710
Sample Time	(hh:mm) 1650
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

6802 - 6805

Sample Site (Con't): R3

Sample Date (Con't): JULY 19 2016

Sample Time (Con't): 1650

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 19 1650
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 19 1650
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☒	1	
500 ml (plastic)	TSS	-	-	☒	1	
				Total:		

General Notes:

WATER SLIGHTY TURBID.

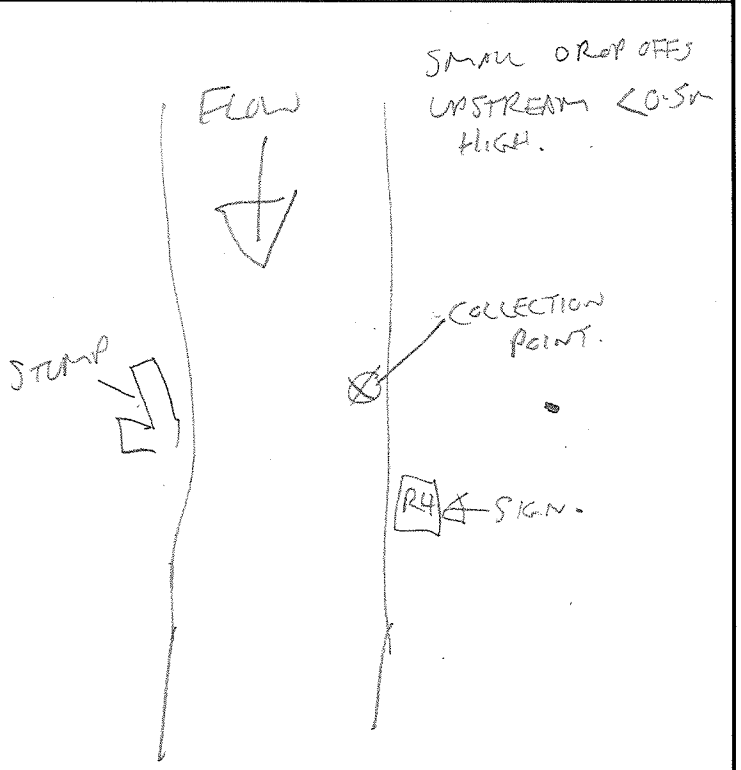
DO READINGS ARE HIGH. DO NOT USE.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R4	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 21 2016
UTM Coordinates	Z 7 E 0515980 N 7145552	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GARMIN Name R4	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~10°C V. LIGHT RAIN. OVERCAST
Photos	Cam GARMIN Nos. 6845-6845 50				
Sample Time (24h)	1345				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	0.08
Temperature (°C)	4.9
pH (pH Units)	PEN =
Cond. (µs/cm)	389.4
Specific Cond. (µs/cm)	631.9
Redox (mV)	132.5
DO (mg/L)	11.79
DO (%)	92.2
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR, NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1347
Sample Time	(hh:mm) 1345
Unit Used	☒ Pro Plus ☒ Pen Unit Other _____

PH

Sample Site (Con't): R4

Sample Date (Con't): JULY 21 2016

Sample Time (Con't): 1345

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: 24/7/2016 1245
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 21 1345
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes: GEN CHEM - DELAYED COLLECTION - DONE 24/7/2016

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R6*	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 22 2014
UTM Coordinates	Z__ E _____ N _____*	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NTB
Waypoint	GPS GMAP Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	RAIN ~16°C 100% CLOUD
Photos	Cam GMAP Nos. 6903 - 6904				
Sample Time (24h)	1820				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	* GOOD
Sample Depth (m)	0.1
Temperature (°C)	10.6
pH (pH Units)	7.87
Cond. (µs/cm)	112.8
Specific Cond. (µs/cm)	155.8
Redox (mV)	126.4
DO (mg/L)	10.03
DO (%)	90.5
Turbidity (NTU)	TURBID
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWN - TURBID.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1826 (CCTC)
Sample Time	(hh:mm) 1820
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Site Sketch

* NOTES.
FORTY MILE RIVER VERY HIGH DUE TO RAIN. THIS SAMPLE WAS COLLECTED AT THE CLINTON CREEK TOWN SITE (HOMESTEAD) UPSTREAM OF THE ~~ORIGINAL~~ USUAL R6 LOCATION, ~~R5~~ AND STILL CONSIDERED TO BE A REFERENCE SITE ON THE FORTY MILE.
USUAL R6 LOCATION WAS NOT SAFE TO ACCESS DUE TO HIGH WATER

Sample Site (Con't): R6 *

Sample Date (Con't): JULY 22 2016

Sample Time (Con't): 1820

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 24 2016 1330
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: JULY 22
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
1 L (plastic)	Asbestos	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

SEE OVER

GEN CHEM TO COLLECT. ✓

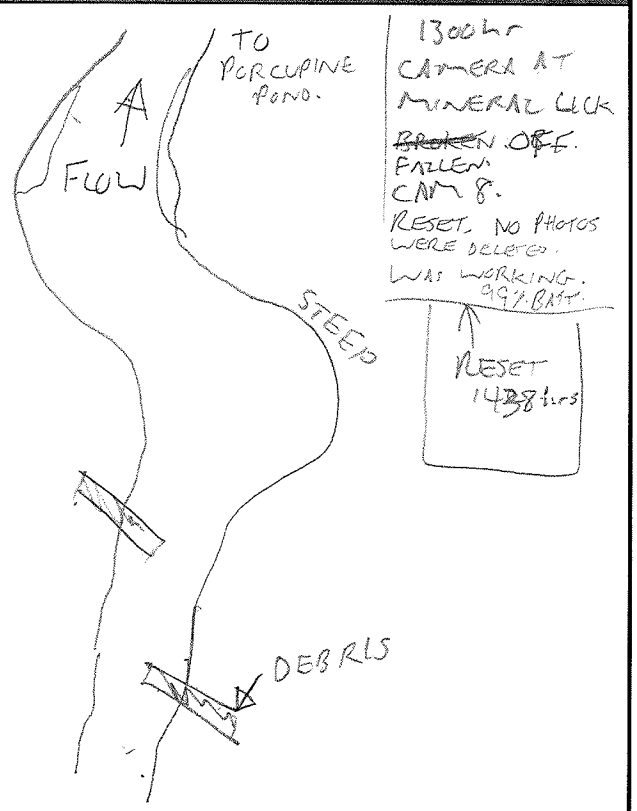
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R7	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 20 2016
UTM Coordinates	Z__ E 0513003 N 7145659	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name R7	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~15°C PARTIAL CLOUD
Photos	Cam GMR Nos. 6814 - 6816				
Sample Time (24h)	1320				
Field Blank Collected:	☐ Yes ☒ No Name ____	**Duplicate Collected:**	☐ Yes ☒ No Name ____		

Field Parameter Measurements (note units if different than those stated)

Station Status	OK. BEAVERS AFFECTING DOWNSTREAM FLOW OK FOR THIS OCCASION.
Sample Depth (m)	0-10
Temperature (°C)	5.3
pH (pH Units)	7.42
Cond. (µs/cm)	167.5
Specific Cond. (µs/cm)	268.7
Redox (mV)	51.1
DO (mg/L)	10.65
DO (%)	84.1
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWNISH. SLIGHTLY TURBID.

Site Sketch



Field Measurements Log

YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1319
Sample Time	(hh:mm) 1320
Unit Used	☒ Pro Plus ~~☒ Pen Unit~~ Other PEN USED.

COND. ~~PEN NOT REQUIRED.~~ COND. = 334 µs/ TWICE THAT OF YSI (CHECK UNITS) USE YSI READING. PEN ~~HAD~~ NOT BEEN CALIBRATED.

Sample Site (Con't): R7

Sample Date (Con't): JULY 20 2016

Sample Time (Con't): 1320

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 20 2016 1320
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	Wrapped tightly in foil	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

SLIGHTLY TURBID.

LOW FLOW, NARROW CREEK (<1m IN MANY LOCATIONS)

THIS SITE IS LIKELY AFFECTED BY BEAVER ACTIVITY.

SITE WAS MOVED UPSTREAM BUT BEAVER ACTIVITY IS EXTENSIVE DOWNSTREAM

NAME TAG WAS NOT MOVED (MOVE IN AUGUST). NEW FLAGGING INSTALLED ON ACCESS TRAIL

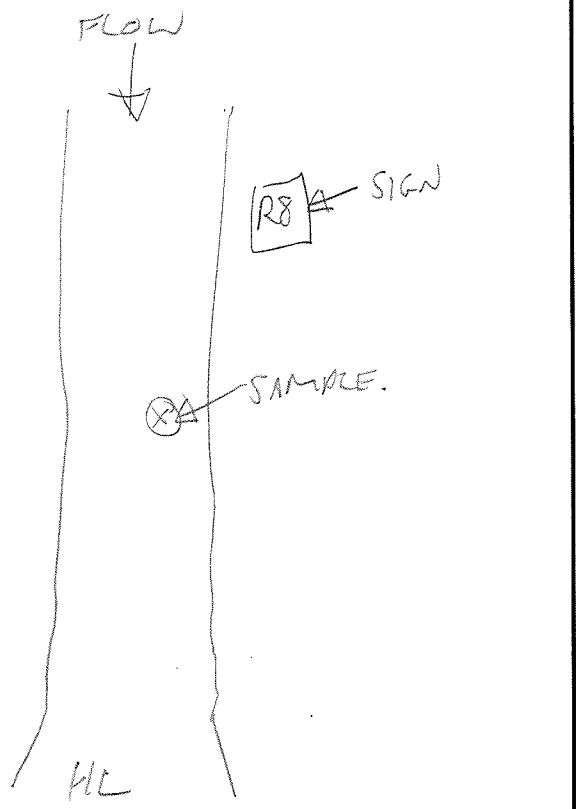
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R8	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 23 2016
UTM Coordinates	Z 9W E 0511895 N 7147900	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name R8	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~20°C Some Cloud No PRECIP.
Photos	Cam GMR Nos. 6928 – 6932				
Sample Time (24h)	1715				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. WATER IS CLEAR (MOSTLY)
Sample Depth (m)	0.05
Temperature (°C)	6.6
pH (pH Units)	7.72
Cond. (µs/cm)	172.2
Specific Cond. (µs/cm)	265.4
Redox (mV)	51.2
DO (mg/L)	10.92
DO (%)	89.1
Turbidity (NTU)	V. SLIGHTY TURBID. COMES THROUGH FOREST.
Appearance & Odour (Clear, Silty, HC odours, etc.)	NO ODOUR.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1712
Sample Time	(hh:mm) 1715
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Site Sketch



Sample Site (Con't): R8

Sample Date (Con't): JULY 23 2016

Sample Time (Con't): 1715

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 23
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

THIS CREEK HAS CLEARER WATER THAN R1 + R2.
SOME BANK VEGETATION AFFECTED BY HIGH WATER BUT ~~AS~~ NOT AS MUCH AS OTHER SITES.

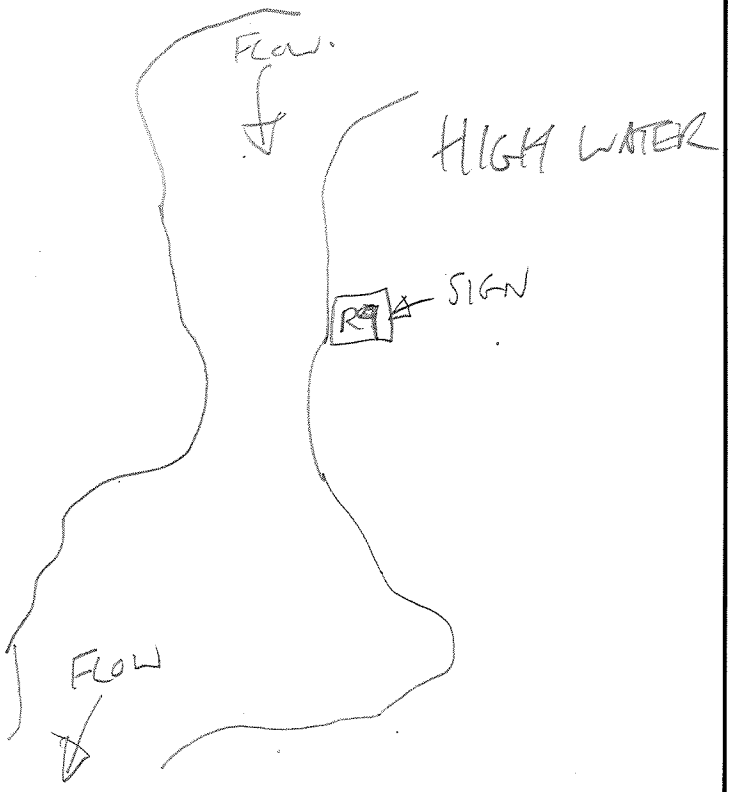
SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R9	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 23 2016
UTM Coordinates	Z 07W E 0512340 N 7146752	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + ~~NB~~ NB
Waypoint	GPS GMR Name R9	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~17°C BF. 1-2 HIGH CLOUD.
Photos	Cam GMR Nos. 6933-6937				
Sample Time (24h)	1815				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD. TURBID (BROWN WATER
Sample Depth (m)	0.1
Temperature (°C)	6.6
pH (pH Units)	7.64
Cond. (µs/cm)	143.8
Specific Cond. (µs/cm)	225.6
Redox (mV)	48.2
DO (mg/L)	11.48
DO (%)	92.1
Turbidity (NTU)	TURBID.
Appearance & Odour (Clear, Silty, HC odours, etc.)	BROWN. NO ODOUR.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1811
Sample Time	(hh:mm) 1815
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Site Sketch



Sample Site (Con't): R9

Sample Date (Con't): JULY 23 2016

Sample Time (Con't): 1815

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 23 2016
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

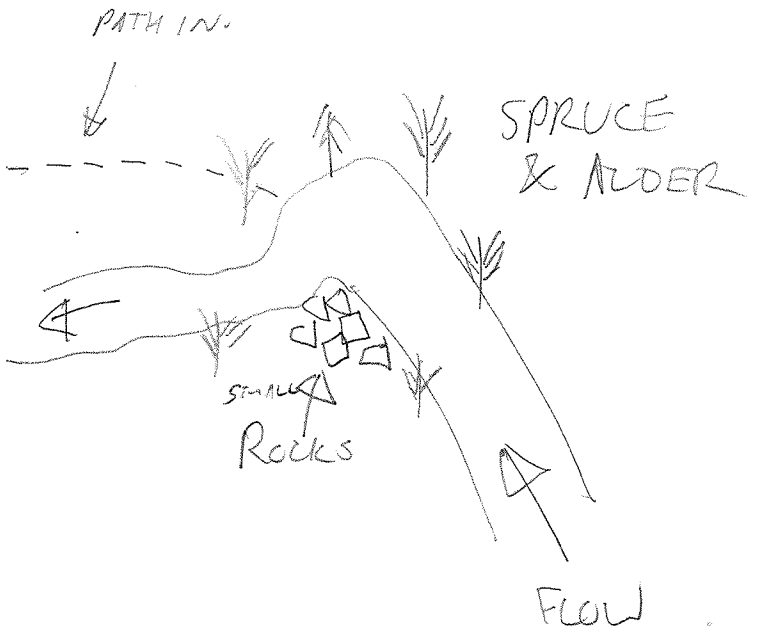
TURBID (BROWN WATER)
RECENT RAIN HAS AFFECTED FLOWS AND TURBIDITY AT ALL SITES VISITED TO DATE. DURING THIS SAMPLING EVENT.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R11	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 19 2016
UTM Coordinates	Z __ E 0514777 N 7147828	**Client:**	Yukon Government (AAM)	**Samplers:**	GMR + NB
Waypoint	GPS GMR Name R11	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	~16°C LIGHT RAIN OCCASIONALLY, OVERCAST
Photos	Cam GMR Nos. 6794 6797				
Sample Time (24h)	1430				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD, WATER CLEAR
Sample Depth (m)	~~0.10~~ 0.10
Temperature (°C)	5.7
pH (pH Units)	8.11
Cond. (µs/cm)	~~482.1~~ 303.9
Specific Cond. (µs/cm)	481.9
Redox (mV)	168.8
DO (mg/L)	14.05 HIGH?
DO (%)	112.1 (?)
Turbidity (NTU)	←
Appearance & Odour (Clear, Silty, HC odours, etc.)	CLEAR, NO ODOUR

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 1434
Sample Time	(hh:mm) 1430
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): R11

Sample Date (Con't): JULY 19 2016

Sample Time (Con't): 1430

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: JULY 19, 2016.
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: 〃 〃
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	~~MAY NOT BE~~ PRESERVED. @ 2130
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~		☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

SOME BUSH ~~LACKING~~ WHACKING REQUIRED TO GET TO SITE.

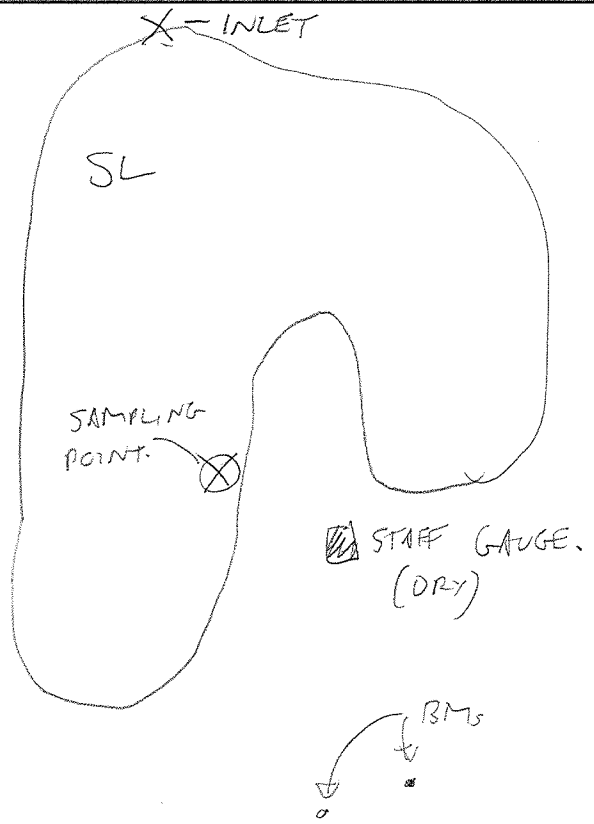
DO READINGS ARE HIGH. DO NOT USE.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	SL	**Project Number:**	16-240.3 Clinton Creek Water Program	**Date:**	JULY 24 2016
UTM Coordinates	Z 07V E 0513825 N 7146706	**Client:**	Yukon Government (AAM)	**Samplers:**	GR + NB
Waypoint	GPS GMR Name SL	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	9°C BLUE SKIES Ø WIND
Photos	Cam GMR Nos. 6938 - 6944				
Sample Time (24h)	0850				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD.
Sample Depth (m)	0.1
Temperature (°C)	14.6
pH (pH Units)	8.50
Cond. (µs/cm)	1215
Specific Cond. (µs/cm)	1518
Redox (mV)	73.4
DO (mg/L)	9.56
DO (%)	93.3
Turbidity (~~NTU~~)	V. SLIGHTY TURBID.
Appearance & Odour (Clear, Silty, HC odours, etc.)	

Site Sketch



Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 0853
Sample Time	(hh:mm) 0850
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): SL

Sample Date (Con't): JULY 24 2016

Sample Time (Con't): 0850

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time:
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)	-	☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
~~1 L (plastic)~~	~~Asbestos~~	~~Wrapped tightly in foil~~	-	☐		
500 ml (plastic)	TSS	-	-	☒	1	
				Total:	10	

General Notes:

FULL SET.

APPENDIX 3

Hudgeon Lake *In-Situ* Profile Data

Appendix 3: Hudgeon Lake In-Situ Profile Data

Site	Depth (m)	Date/Time	Conductivity (uS/cm)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (pH Units)	Temperature (C)
HL1	0	23/07/2016 12:38	405.8	500	8.94	25.4	8.14	15.1
HL1	1	23/07/2016 12:43	410.3	532	8.58	25.4	8.03	13
HL1	2	23/07/2016 12:46	333.7	454.3	9.47	28.9	7.92	11.1
HL1	3	23/07/2016 12:48	320.6	449	9.97	38	7.9	10
HL1	4	23/07/2016 12:51	390.3	580	5.1	56.2	7.42	7.9
HL1	5	23/07/2016 12:53	448.1	735	1.32	63.1	7.28	4.6
HL1	6	23/07/2016 12:55	451.5	759	0.5	62.7	7.28	3.8
HL1	7	23/07/2016 12:58	452.9	764	0.4	61.3	7.27	3.7
HL1	8	23/07/2016 13:01	456.2	781	0.11	59.2	7.28	3.2
HL1	9	23/07/2016 13:09	516	908	0.07	-32.5	7.3	2.4
HL1	10	23/07/2016 13:11	574	1024	0.06	-66	7.33	2
HL1	10.5	23/07/2016 13:19	579	1033	0.08	-88.3	7.32	2
HL2	0	23/07/2016 11:09	409.1	501	8.34	33.2	8.13	15.4
HL2	1	23/07/2016 11:12	395.3	509	8.95	45.6	8.04	13.3
HL2	2	23/07/2016 11:15	398.7	535	7.97	56.5	7.86	11.6
HL2	3	23/07/2016 11:19	376.5	531	6.86	72.7	7.58	9.7
HL2	4	23/07/2016 11:24	407.5	622	3.92	83.2	7.34	6.9
HL2	5	23/07/2016 11:26	445.1	750	0.85	84.1	7.27	3.7
HL2	6	23/07/2016 11:28	447.6	764	0.6	82.7	7.27	3.3
HL2	7	23/07/2016 11:30	450.3	779	0.19	81	7.27	2.9
HL2	8	23/07/2016 11:33	457.3	799	0.08	78.6	7.27	2.6
HL2	9	23/07/2016 11:43	519	920	0.09	-77.8	7.27	2.2
HL2	10	23/07/2016 11:47	577	1030	0.1	-98.9	7.26	2
HL2	11	23/07/2016 11:52	597	1072	0.13	-108.8	7.25	1.8
HL2	12	23/07/2016 11:54	604	1086	0.16	-110.6	7.25	1.8
HL2	13	23/07/2016 11:57	612	1102	0.15	-113.6	7.24	1.7
HL2	14	23/07/2016 11:59	618	1115	0.15	-115.1	7.24	1.6
HL2	15	23/07/2016 12:01	624	1131	0.15	-114.1	7.24	1.6
HL2	16	23/07/2016 12:04	667	1215	0.17	-119.3	7.25	1.4
HL2	17	23/07/2016 12:06	677	1237	0.17	-122.1	7.25	1.3
HL2	18	23/07/2016 12:08	722	1327	0.15	-124.3	7.25	1.1
HL2	19	23/07/2016 12:10	733	1352	0.16	-125.3	7.25	1
HL2	20	23/07/2016 12:13	734	1355	0.18	-130.3	7.27	1
HL3	0	23/07/2016 8:57	404.8	504	8.12	150.2	8.09	14.7
HL3	1	23/07/2016 9:00	405.9	508	8.17	150.1	8.13	14.5
HL3	2	23/07/2016 9:03	380.9	504	7.71	154.3	7.78	12.2
HL3	3	23/07/2016 9:07	378.6	524	6.9	157	7.62	10.5
HL3	4	23/07/2016 9:10	439.7	704	2.04	165.9	7.26	5.3
HL3	5	23/07/2016 9:13	446.9	761	0.75	167.8	7.23	3.4
HL3	6	23/07/2016 9:19	448.9	773	0.37	166.2	7.22	3
HL3	7	23/07/2016 9:22	450.3	784	0.12	165.8	7.22	2.7
HL3	8	23/07/2016 9:31	460.1	807	0.11	159.7	7.22	2.5
HL3	9	23/07/2016 9:45	512	905	0.1	-68.1	7.25	2.2
HL3	10	23/07/2016 9:55	568	1009	0.13	-111.4	7.24	2.1
HL3	11	23/07/2016 10:00	593	1060	0.14	-117	7.23	1.9
HL3	12	23/07/2016 10:04	603	1081	0.14	-121.5	7.22	1.8
HL3	13	23/07/2016 10:06	610	1097	0.13	-122.5	7.22	1.7
HL3	14	23/07/2016 10:09	616	1109	0.15	-121.8	7.21	1.7
HL3	15	23/07/2016 10:13	627	1135	0.17	-124.9	7.21	1.6
HL3	16	23/07/2016 10:16	670	1222	0.19	-129.8	7.23	1.4
HL3	17	23/07/2016 10:20	678	1241	0.2	-132.6	7.23	1.3
HL3	18	23/07/2016 10:21	719	1322	0.23	-133.4	7.22	1.1
HL3	19	23/07/2016 10:23	733	1349	0.21	-134.9	7.22	1.1
HL3	20	23/07/2016 10:27	821	1517	0.23	-137	7.21	1
HL3	21	23/07/2016 10:29	901	1672	0.26	-138.1	7.2	0.9
HL3	22	23/07/2016 10:48	1027	1919	0.3	-133.9	7.24	0.7
HL3	23	23/07/2016 10:52	1113	2094	0.35	-137	7.23	0.5
HL3	24	23/07/2016 10:54	1182	2237	0.37	-138.2	7.22	0.3
HL3	24.9	23/07/2016 10:57	1239	2358	0.4	-140.2	7.21	0.2

APPENDIX 4

Tabulated Stream Gauging Data

Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E1(H)
Date and Time:	Jul.22/2016, 11:57
Staff:	GR,NB
UTM Coordinates:	512800. 7147438
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.3/~11
Crossing Number	1

Ecological Logistics & Research Ltd.

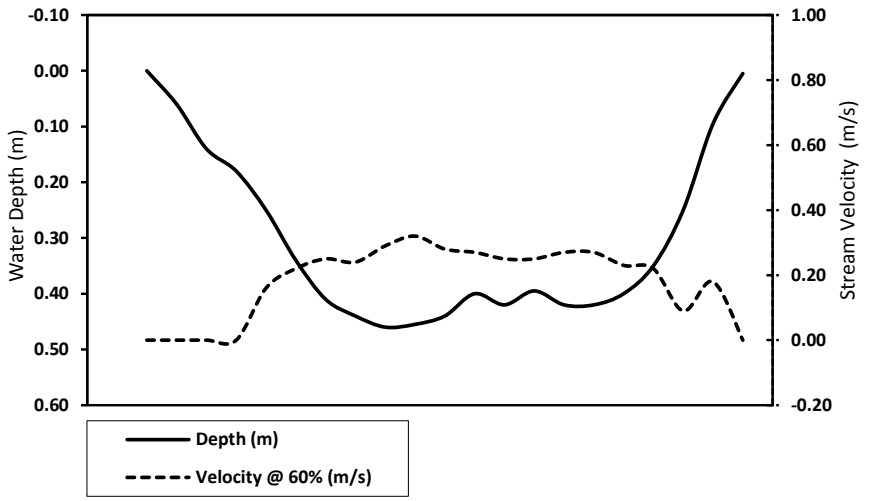
Left Bank	11.83
Right Bank	0.77
Wet.Width	11.06

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.77	0.275	0.00	0.00	0.000	0.0000
1	1.32	0.550	0.06	0.00	0.033	0.0000
2	1.87	0.550	0.14	0.00	0.077	0.0000
3	2.42	0.550	0.18	0.00	0.099	0.0000
4	2.97	0.555	0.25	0.16	0.139	0.0222
5	3.53	0.555	0.34	0.22	0.189	0.0415
6	4.08	0.550	0.41	0.25	0.226	0.0564
7	4.63	0.550	0.44	0.24	0.242	0.0581
8	5.18	0.550	0.46	0.29	0.253	0.0734
9	5.73	0.550	0.46	0.32	0.250	0.0801
10	6.28	0.555	0.44	0.28	0.244	0.0684
11	6.84	0.555	0.40	0.27	0.222	0.0599
12	7.39	0.555	0.42	0.25	0.233	0.0583
13	7.95	0.550	0.40	0.25	0.217	0.0543
14	8.49	0.550	0.42	0.27	0.231	0.0624
15	9.05	0.555	0.42	0.27	0.233	0.0629
16	9.60	0.550	0.40	0.23	0.220	0.0506
17	10.15	0.475	0.35	0.22	0.166	0.0366
18	10.55	0.545	0.25	0.09	0.136	0.0123
19	11.24	0.640	0.10	0.18	0.061	0.0109
20	11.83	0.295	0.01	0.00	0.001	0.0000
end	11.83					

Mean Depth (m)	0.30
Mean Velocity (m/s)	0.18

Discharge (m^3/s)	0.8082

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E1(H)
Date and Time:	Jul.22/2016, 11:57
Staff:	GR,NB
UTM Coordinates:	512800. 7147438
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.3/~11
Crossing Number	2

Ecological Logistics & Research Ltd.

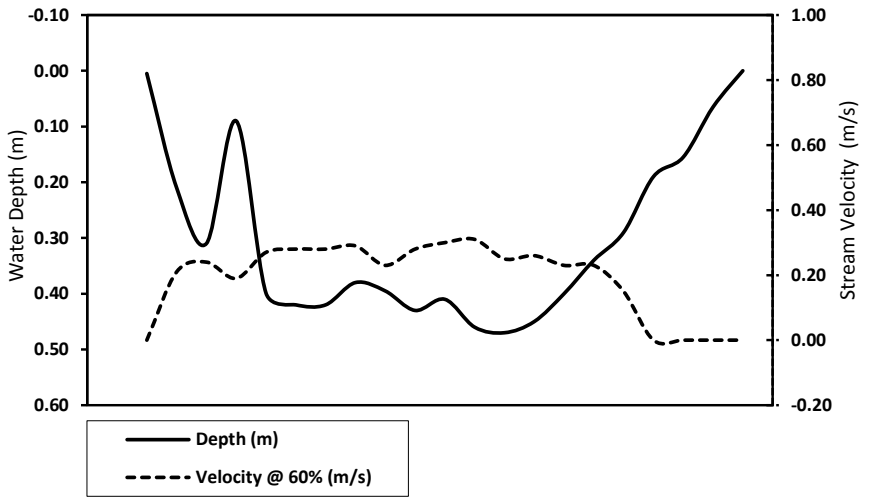
Left Bank	11.83
Right Bank	0.77
Wet.Width	11.06

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	11.83	0.015	0.01	0.00	0.000	0.0000
1	11.80	0.285	0.21	0.21	0.060	0.0126
2	11.26	0.300	0.31	0.24	0.093	0.0223
3	11.20	0.770	0.09	0.19	0.069	0.0132
4	9.72	1.025	0.40	0.27	0.409	0.1104
5	9.15	0.555	0.42	0.28	0.233	0.0653
6	8.61	0.550	0.42	0.28	0.231	0.0647
7	8.05	0.550	0.38	0.29	0.209	0.0606
8	7.51	0.550	0.40	0.23	0.217	0.0500
9	6.95	0.560	0.43	0.28	0.241	0.0674
10	6.39	0.550	0.41	0.30	0.226	0.0677
11	5.85	0.555	0.46	0.31	0.255	0.0791
12	5.28	0.540	0.47	0.25	0.254	0.0635
13	4.77	0.540	0.45	0.26	0.243	0.0632
14	4.20	0.560	0.40	0.23	0.224	0.0515
15	3.65	0.550	0.34	0.23	0.187	0.0430
16	3.10	0.550	0.29	0.15	0.160	0.0239
17	2.55	0.550	0.19	0.00	0.105	0.0000
18	2.00	0.565	0.16	0.00	0.088	0.0000
19	1.42	0.615	0.07	0.00	0.040	0.0000
20	0.77	0.325	0.00	0.00	0.000	0.0000
end	0.77					

Mean Depth (m)	0.30
Mean Velocity (m/s)	0.19

Discharge (m^3/s)	0.8583

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E2
Date and Time:	Jul.21/2016, 18:19
Staff:	GR,NB
UTM Coordinates:	514149. 7147189
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.4/~14
Crossing Number	1

Ecological Logistics & Research Ltd.

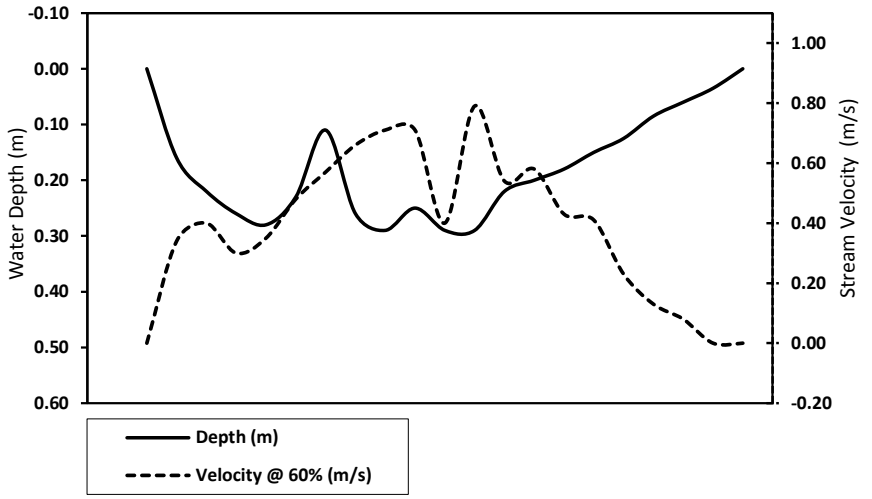
Left Bank	7.53
Right Bank	0.86
Wet.Width	6.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.86	0.165	0.00	0.00	0.000	0.0000
1	1.19	0.330	0.16	0.34	0.053	0.0180
2	1.52	0.330	0.22	0.40	0.073	0.0290
3	1.85	0.320	0.26	0.30	0.083	0.0250
4	2.16	0.320	0.28	0.35	0.090	0.0314
5	2.49	0.340	0.23	0.48	0.078	0.0375
6	2.84	0.340	0.11	0.57	0.037	0.0213
7	3.17	0.330	0.26	0.66	0.086	0.0566
8	3.50	0.355	0.29	0.71	0.103	0.0731
9	3.88	0.355	0.25	0.71	0.089	0.0630
10	4.21	0.330	0.29	0.40	0.096	0.0383
11	4.54	0.330	0.29	0.79	0.096	0.0756
12	4.87	0.330	0.22	0.54	0.073	0.0392
13	5.20	0.330	0.20	0.58	0.066	0.0383
14	5.53	0.330	0.18	0.43	0.059	0.0255
15	5.86	0.330	0.15	0.41	0.050	0.0203
16	6.19	0.330	0.13	0.23	0.041	0.0095
17	6.52	0.330	0.09	0.13	0.028	0.0036
18	6.85	0.305	0.06	0.08	0.018	0.0015
19	7.13	0.340	0.04	0.00	0.012	0.0000
20	7.53	0.200	0.00	0.00	0.000	0.0000
end	7.53					

Mean Depth (m)	0.18
Mean Velocity (m/s)	0.39

Discharge (m^3/s)	0.6067

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E2
Date and Time:	Jul.21/2016, 18:19
Staff:	GR,NB
UTM Coordinates:	514149. 7147189
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.4/~14
Crossing Number	2

Ecological Logistics & Research Ltd.

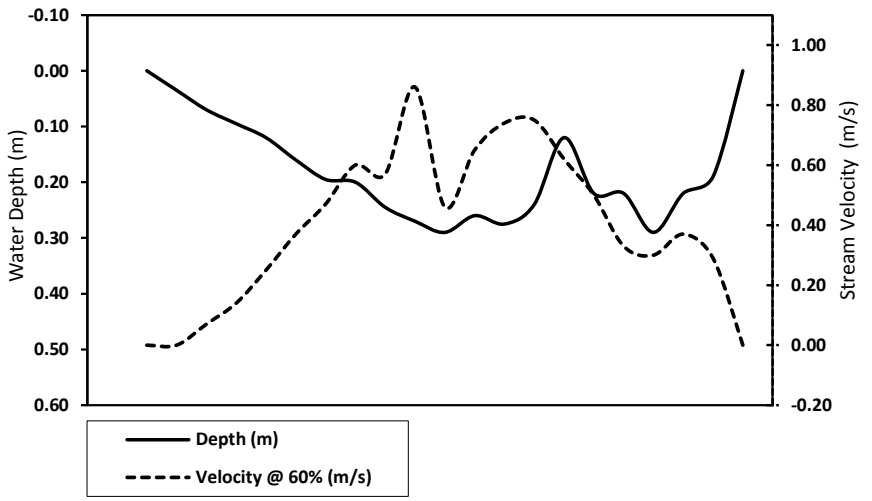
Left Bank	7.53
Right Bank	0.86
Wet.Width	6.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	7.53	0.200	0.00	0.00	0.000	0.0000
1	7.13	0.345	0.04	0.00	0.012	0.0000
2	6.84	0.310	0.07	0.07	0.022	0.0015
3	6.51	0.330	0.10	0.14	0.031	0.0044
4	6.18	0.335	0.12	0.25	0.040	0.0101
5	5.84	0.335	0.16	0.37	0.054	0.0198
6	5.51	0.325	0.20	0.47	0.063	0.0298
7	5.19	0.325	0.20	0.60	0.065	0.0390
8	4.86	0.325	0.25	0.57	0.080	0.0454
9	4.54	0.320	0.27	0.86	0.086	0.0743
10	4.22	0.335	0.29	0.46	0.097	0.0447
11	3.87	0.340	0.26	0.65	0.088	0.0575
12	3.54	0.325	0.28	0.74	0.089	0.0661
13	3.22	0.345	0.24	0.75	0.083	0.0621
14	2.85	0.360	0.12	0.62	0.043	0.0268
15	2.50	0.340	0.22	0.50	0.075	0.0374
16	2.17	0.330	0.22	0.33	0.073	0.0240
17	1.84	0.330	0.29	0.30	0.096	0.0287
18	1.51	0.330	0.22	0.37	0.073	0.0269
19	1.18	0.325	0.19	0.29	0.062	0.0179
20	0.86	0.160	0.00	0.00	0.000	0.0000
end	0.86					

Mean Depth (m)	0.18
Mean Velocity (m/s)	0.40

Discharge (m^3/s)	0.6163

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	E3(H)
Date and Time:	Jul.19/2016, 11:43
Staff:	GR,NB
UTM Coordinates:	514170. 7147608
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	8.2/~15
Crossing Number	1

Ecological Logistics & Research Ltd.

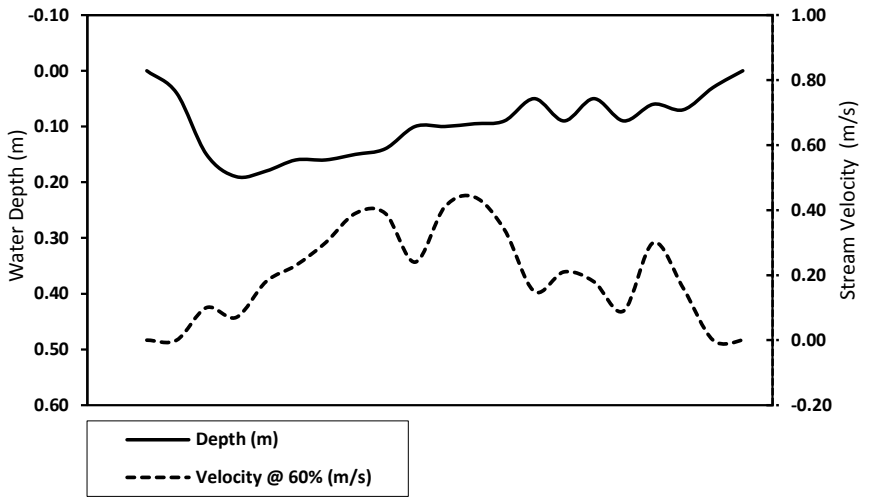
Left Bank	4.38
Right Bank	0.7
Wet.Width	3.68

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.70	0.100	0.00	0.00	0.000	0.0000
1	0.90	0.185	0.04	0.00	0.007	0.0000
2	1.07	0.170	0.15	0.10	0.026	0.0026
3	1.24	0.175	0.19	0.07	0.033	0.0023
4	1.42	0.180	0.18	0.18	0.032	0.0058
5	1.60	0.190	0.16	0.23	0.030	0.0070
6	1.80	0.175	0.16	0.30	0.028	0.0084
7	1.95	0.165	0.15	0.39	0.025	0.0097
8	2.13	0.170	0.14	0.39	0.024	0.0093
9	2.29	0.170	0.10	0.24	0.017	0.0041
10	2.47	0.115	0.10	0.41	0.012	0.0047
11	2.52	0.105	0.10	0.44	0.010	0.0044
12	2.68	0.175	0.09	0.34	0.016	0.0054
13	2.87	0.185	0.05	0.15	0.009	0.0014
14	3.05	0.175	0.09	0.21	0.016	0.0033
15	3.22	0.165	0.05	0.18	0.008	0.0015
16	3.38	0.180	0.09	0.09	0.016	0.0015
17	3.58	0.195	0.06	0.30	0.012	0.0035
18	3.77	0.255	0.07	0.16	0.018	0.0029
19	4.09	0.305	0.03	0.00	0.009	0.0000
20	4.38	0.145	0.00	0.00	0.000	0.0000
end	4.38					

Mean Depth (m)	0.10
Mean Velocity (m/s)	0.20

Discharge (m^3/s)	0.0776

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	E3(H)
Date and Time:	Jul.19/2016, 11:43
Staff:	GR,NB
UTM Coordinates:	514170. 7147608
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	8.2/~15
Crossing Number	2

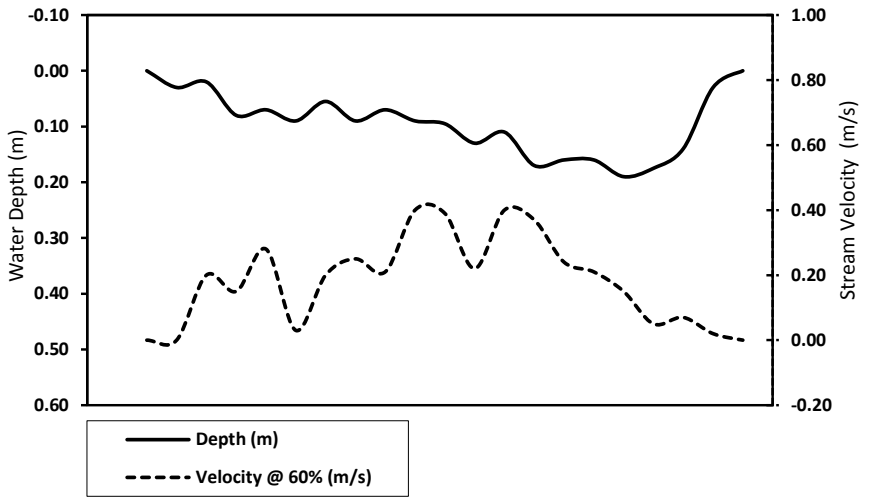
Left Bank	4.38
Right Bank	0.7
Wet.Width	3.68

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	4.38	0.125	0.00	0.00	0.000	0.0000
1	4.13	0.225	0.03	0.00	0.007	0.0000
2	3.93	0.190	0.02	0.20	0.004	0.0008
3	3.75	0.175	0.08	0.15	0.014	0.0021
4	3.58	0.180	0.07	0.28	0.013	0.0035
5	3.39	0.190	0.09	0.03	0.017	0.0005
6	3.20	0.185	0.06	0.20	0.010	0.0020
7	3.02	0.180	0.09	0.25	0.016	0.0041
8	2.84	0.185	0.07	0.21	0.013	0.0027
9	2.65	0.190	0.09	0.40	0.017	0.0068
10	2.46	0.185	0.10	0.39	0.018	0.0069
11	2.28	0.175	0.13	0.22	0.023	0.0050
12	2.11	0.170	0.11	0.40	0.019	0.0075
13	1.94	0.180	0.17	0.37	0.031	0.0113
14	1.75	0.180	0.16	0.24	0.029	0.0069
15	1.58	0.175	0.16	0.21	0.028	0.0059
16	1.40	0.170	0.19	0.15	0.032	0.0048
17	1.24	0.140	0.18	0.05	0.025	0.0012
18	1.12	0.170	0.14	0.07	0.024	0.0017
19	0.90	0.210	0.03	0.02	0.006	0.0001
20	0.70	0.100	0.00	0.00	0.000	0.0000
end	0.70					

Mean Depth (m)	0.09
Mean Velocity (m/s)	0.18

Discharge (m^3/s)	0.0739

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E4
Date and Time:	Jul.24/2016, 16:25
Staff:	GR,NB
UTM Coordinates:	515950. 7145287
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.0/~14
Crossing Number	1

Ecological Logistics & Research Ltd.

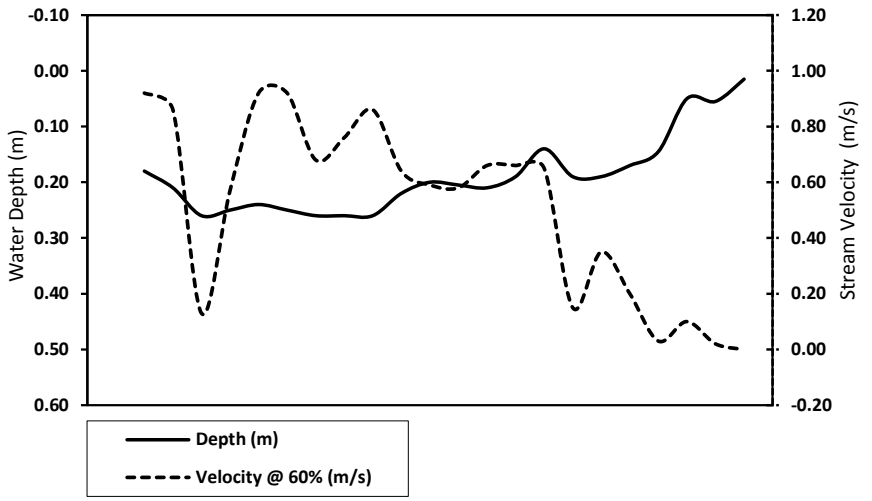
Left Bank	7.38
Right Bank	1.03
Wet.Width	6.35

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	7.38	0.155	0.18	0.92	0.028	0.0257
1	7.07	0.305	0.21	0.86	0.064	0.0551
2	6.77	0.305	0.26	0.13	0.079	0.0103
3	6.46	0.310	0.25	0.57	0.077	0.0442
4	6.15	0.315	0.24	0.92	0.076	0.0696
5	5.83	0.315	0.25	0.92	0.079	0.0725
6	5.52	0.305	0.26	0.68	0.079	0.0539
7	5.22	0.310	0.26	0.76	0.081	0.0613
8	4.90	0.315	0.26	0.86	0.082	0.0704
9	4.59	0.310	0.22	0.64	0.068	0.0436
10	4.28	0.310	0.20	0.59	0.062	0.0366
11	3.97	0.310	0.21	0.58	0.064	0.0369
12	3.66	0.310	0.21	0.66	0.065	0.0430
13	3.35	0.310	0.19	0.66	0.059	0.0389
14	3.04	0.310	0.14	0.65	0.043	0.0282
15	2.73	0.300	0.19	0.15	0.057	0.0086
16	2.44	0.300	0.19	0.35	0.057	0.0200
17	2.13	0.305	0.17	0.20	0.052	0.0104
18	1.83	0.315	0.15	0.03	0.046	0.0014
19	1.50	0.315	0.05	0.10	0.016	0.0016
20	1.20	0.235	0.06	0.02	0.013	0.0003
21	1.03	0.085	0.02	0.00	0.001	0.0000
end	1.03					

Mean Depth (m)	0.19
Mean Velocity (m/s)	0.51

Discharge (m^3/s)	0.7321

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E4
Date and Time:	Jul.24/2016, 16:25
Staff:	GR,NB
UTM Coordinates:	515950. 7145287
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.0/~14
Crossing Number	2

Ecological Logistics & Research Ltd.

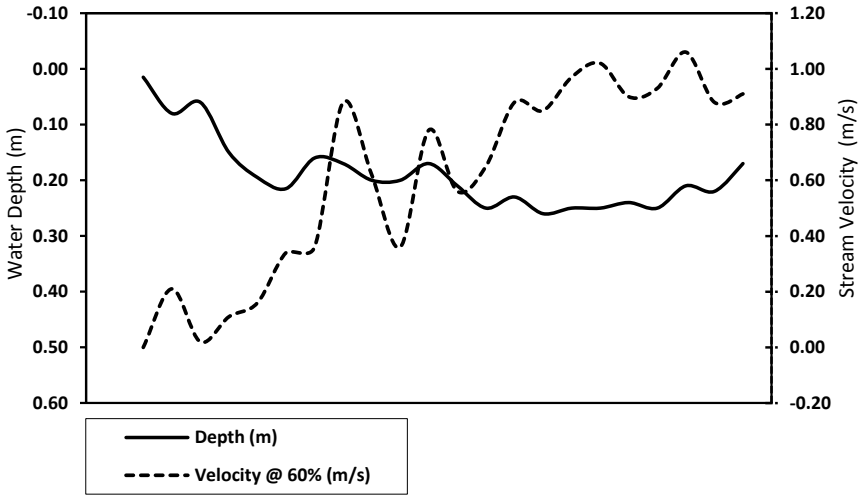
Left Bank	7.38
Right Bank	1.03
Wet.Width	6.35

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.03	0.155	0.02	0.00	0.002	0.0000
1	1.34	0.310	0.08	0.21	0.025	0.0052
2	1.65	0.310	0.06	0.02	0.019	0.0004
3	1.96	0.315	0.15	0.11	0.047	0.0052
4	2.28	0.310	0.20	0.16	0.060	0.0097
5	2.58	0.305	0.22	0.34	0.066	0.0223
6	2.89	0.310	0.16	0.36	0.050	0.0179
7	3.20	0.310	0.17	0.88	0.053	0.0464
8	3.51	0.310	0.20	0.62	0.062	0.0384
9	3.82	0.305	0.20	0.36	0.061	0.0220
10	4.12	0.310	0.17	0.78	0.053	0.0411
11	4.44	0.315	0.21	0.56	0.066	0.0370
12	4.75	0.310	0.25	0.65	0.077	0.0504
13	5.06	0.310	0.23	0.88	0.071	0.0627
14	5.37	0.310	0.26	0.85	0.081	0.0685
15	5.68	0.310	0.25	0.97	0.078	0.0752
16	5.99	0.310	0.25	1.02	0.078	0.0791
17	6.30	0.310	0.24	0.90	0.074	0.0670
18	6.61	0.305	0.25	0.93	0.076	0.0709
19	6.91	0.295	0.21	1.06	0.062	0.0657
20	7.20	0.235	0.22	0.88	0.052	0.0455
21	7.38	0.090	0.17	0.91	0.015	0.0139
end	7.38					

Mean Depth (m)	0.19
Mean Velocity (m/s)	0.61

Discharge (m^3/s)	0.8443

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E7
Date and Time:	Jul.22/2016, 16:32
Staff:	GR,NB
UTM Coordinates:	519400. 7142042
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	11.7/~14
Crossing Number	1

Ecological Logistics & Research Ltd.

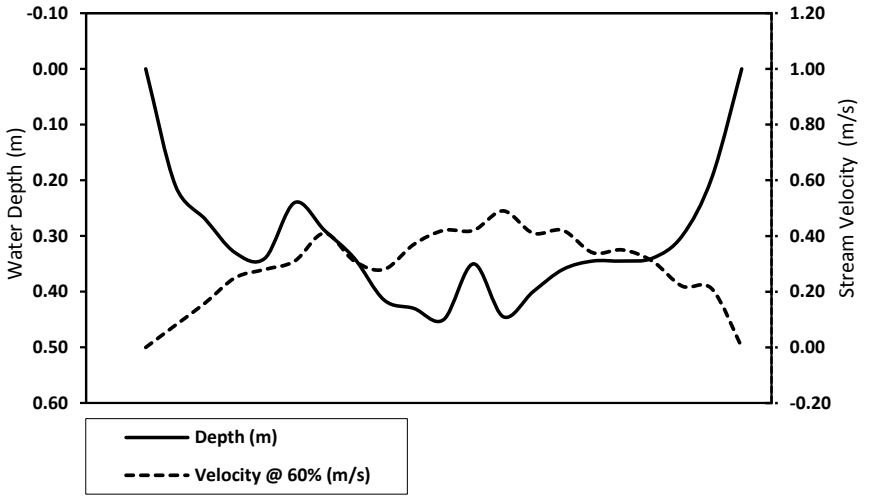
Left Bank	13.94
Right Bank	1.2
Wet.Width	12.74

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.20	0.315	0.00	0.00	0.000	0.0000
1	1.83	0.635	0.21	0.08	0.133	0.0107
2	2.47	0.635	0.27	0.16	0.171	0.0274
3	3.10	0.630	0.33	0.25	0.208	0.0520
4	3.73	0.640	0.34	0.28	0.218	0.0609
5	4.38	0.650	0.24	0.31	0.156	0.0484
6	5.03	0.640	0.29	0.41	0.186	0.0761
7	5.66	0.630	0.34	0.31	0.214	0.0664
8	6.29	0.620	0.42	0.28	0.257	0.0720
9	6.90	0.625	0.43	0.37	0.269	0.0994
10	7.54	0.640	0.45	0.42	0.288	0.1210
11	8.18	0.630	0.35	0.42	0.221	0.0926
12	8.80	0.630	0.45	0.49	0.280	0.1374
13	9.44	0.635	0.40	0.41	0.254	0.1041
14	10.07	0.630	0.36	0.42	0.227	0.0953
15	10.70	0.630	0.35	0.34	0.217	0.0739
16	11.33	0.630	0.35	0.35	0.217	0.0761
17	11.96	0.625	0.34	0.31	0.213	0.0659
18	12.58	0.620	0.30	0.22	0.186	0.0409
19	13.20	0.680	0.20	0.21	0.133	0.0278
20	13.94	0.370	0.00	0.00	0.000	0.0000
end	13.94					

Mean Depth (m)	0.30
Mean Velocity (m/s)	0.29

Discharge (m^3/s)	1.3483

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

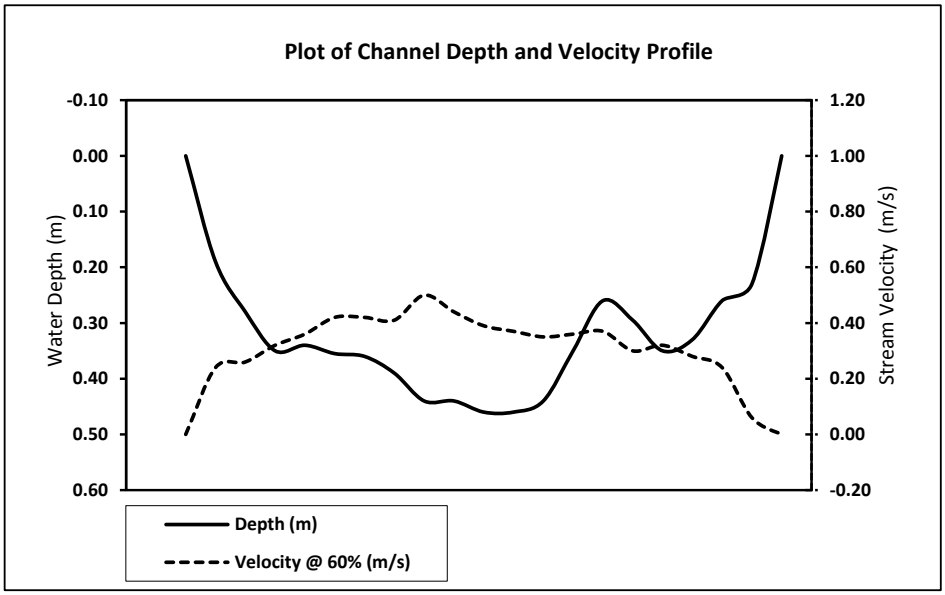
ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E7
Date and Time:	Jul.22/2016, 16:32
Staff:	GR,NB
UTM Coordinates:	519400. 7142042
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	11.7/~14
Crossing Number	2

Left Bank	13.94
Right Bank	1.2
Wet.Width	12.74

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	13.94	0.315	0.00	0.00	0.000	0.0000
1	13.31	0.630	0.19	0.24	0.120	0.0287
2	12.68	0.635	0.28	0.26	0.178	0.0462
3	12.04	0.635	0.35	0.32	0.222	0.0711
4	11.41	0.630	0.34	0.36	0.214	0.0771
5	10.78	0.630	0.36	0.42	0.224	0.0939
6	10.15	0.630	0.36	0.42	0.227	0.0953
7	9.52	0.640	0.39	0.41	0.250	0.1023
8	8.87	0.635	0.44	0.50	0.279	0.1397
9	8.25	0.625	0.44	0.44	0.275	0.1210
10	7.62	0.630	0.46	0.39	0.290	0.1130
11	6.99	0.630	0.46	0.37	0.290	0.1072
12	6.36	0.630	0.44	0.35	0.277	0.0970
13	5.73	0.635	0.35	0.36	0.222	0.0800
14	5.09	0.635	0.26	0.37	0.165	0.0611
15	4.46	0.630	0.30	0.30	0.186	0.0558
16	3.83	0.630	0.35	0.32	0.221	0.0706
17	3.20	0.630	0.33	0.28	0.208	0.0582
18	2.57	0.630	0.26	0.24	0.164	0.0393
19	1.94	0.685	0.23	0.06	0.158	0.0095
20	1.20	0.370	0.00	0.00	0.000	0.0000
end	1.20					

Mean Depth (m)	0.31
Mean Velocity (m/s)	0.31

Discharge (m^3/s)	1.4671



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Groundwater Seep
Station Name:	GWCC-5
Date and Time:	Jul.22/2016, 9:32
Staff:	GR,NB
UTM Coordinates:	513984. 7147127
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.1/~13
Crossing Number	1

Ecological Logistics & Research Ltd.

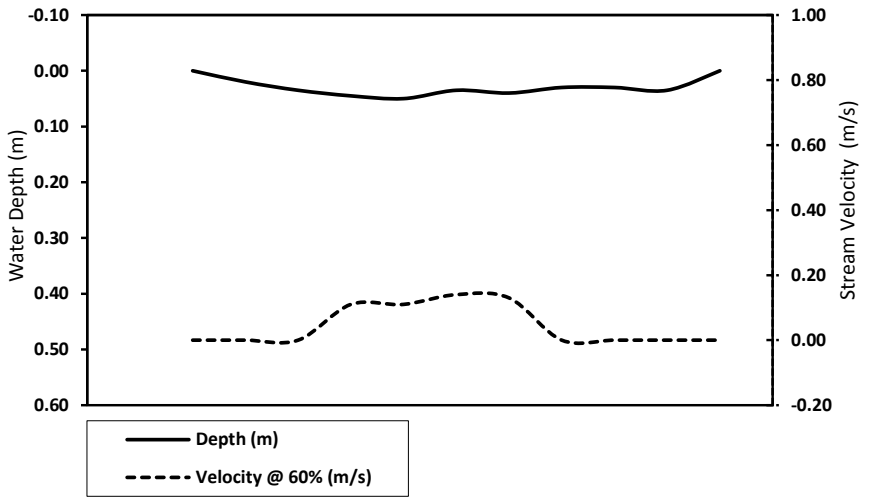
Left Bank	2.9
Right Bank	1.06
Wet.Width	1.84

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.06	0.060	0.00	0.00	0.000	0.0000
1	1.18	0.120	0.02	0.00	0.002	0.0000
2	1.30	0.180	0.04	0.00	0.006	0.0000
3	1.54	0.190	0.05	0.11	0.009	0.0009
4	1.68	0.190	0.05	0.11	0.010	0.0010
5	1.92	0.195	0.04	0.14	0.007	0.0010
6	2.07	0.220	0.04	0.13	0.009	0.0011
7	2.36	0.200	0.03	0.00	0.006	0.0000
8	2.47	0.170	0.03	0.00	0.005	0.0000
9	2.70	0.215	0.04	0.00	0.008	0.0000
10	2.90	0.100	0.00	0.00	0.000	0.0000
end	2.90					

Mean Depth (m)	0.03
Mean Velocity (m/s)	0.04

Discharge (m^3/s)	0.0041

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Groundwater Seep
Station Name:	GWCC-5
Date and Time:	Jul.22/2016, 9:32
Staff:	GR,NB
UTM Coordinates:	513984. 7147127
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.1/~13
Crossing Number	2

Ecological Logistics & Research Ltd.

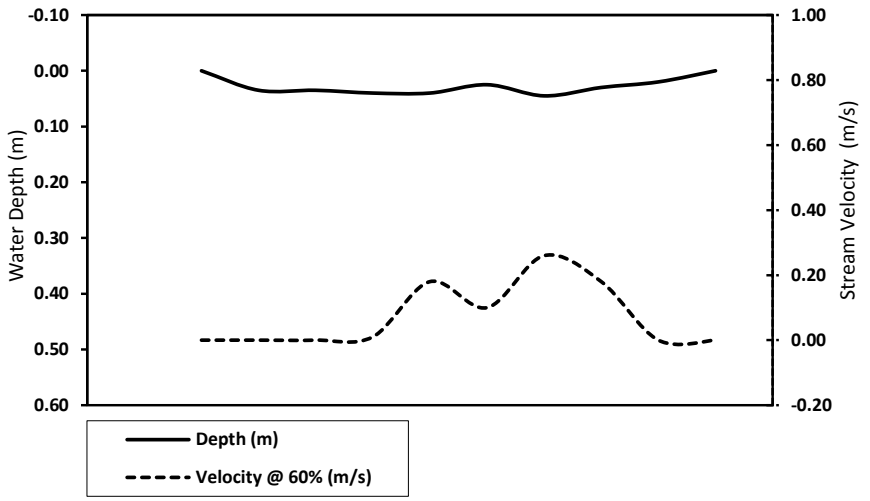
Left Bank	2.9
Right Bank	1.06
Wet.Width	1.84

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.90	0.095	0.00	0.00	0.000	0.0000
1	2.71	0.200	0.04	0.00	0.007	0.0000
2	2.50	0.150	0.04	0.00	0.005	0.0000
3	2.41	0.200	0.04	0.01	0.008	0.0001
4	2.10	0.295	0.04	0.18	0.012	0.0021
5	1.82	0.210	0.03	0.10	0.005	0.0005
6	1.68	0.130	0.05	0.26	0.006	0.0015
7	1.56	0.185	0.03	0.18	0.006	0.0010
8	1.31	0.250	0.02	0.00	0.005	0.0000
9	1.06	0.125	0.00	0.00	0.000	0.0000
end	1.06					

Mean Depth (m)	0.03
Mean Velocity (m/s)	0.07

Discharge (m^3/s)	0.0052

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Upper Clinton Creek
Station Name:	R1
Date and Time:	Jul.23/2016, 15:15
Staff:	GR,NB
UTM Coordinates:	510718. 7147525
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.0/~19
Crossing Number	1

Ecological Logistics & Research Ltd.

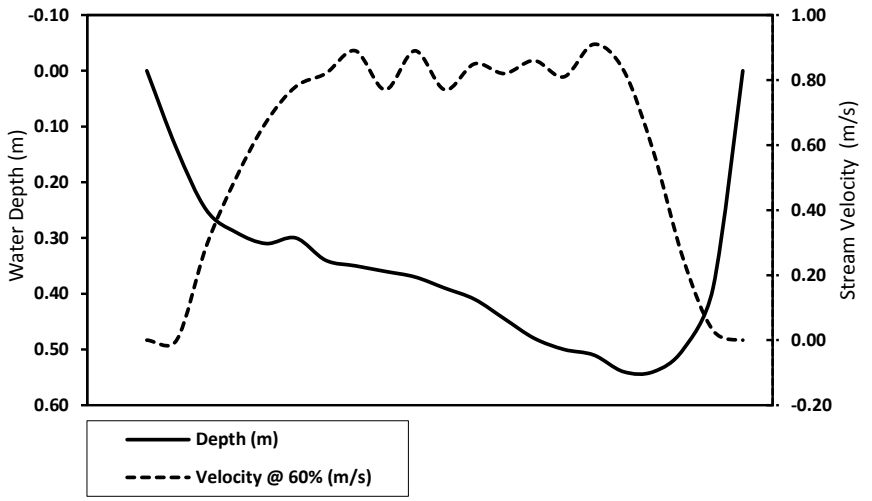
Left Bank	8.4
Right Bank	0.6
Wet.Width	7.8

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.60	0.195	0.00	0.00	0.000	0.0000
1	0.99	0.385	0.14	0.00	0.054	0.0000
2	1.37	0.380	0.25	0.29	0.095	0.0276
3	1.75	0.385	0.29	0.50	0.112	0.0558
4	2.14	0.390	0.31	0.67	0.121	0.0810
5	2.53	0.390	0.30	0.78	0.117	0.0913
6	2.92	0.385	0.34	0.82	0.131	0.1073
7	3.30	0.385	0.35	0.89	0.135	0.1199
8	3.69	0.390	0.36	0.77	0.140	0.1081
9	4.08	0.385	0.37	0.89	0.142	0.1268
10	4.46	0.380	0.39	0.77	0.148	0.1141
11	4.84	0.380	0.41	0.85	0.156	0.1324
12	5.22	0.380	0.45	0.82	0.169	0.1387
13	5.60	0.380	0.48	0.86	0.182	0.1569
14	5.98	0.385	0.50	0.81	0.193	0.1559
15	6.37	0.385	0.51	0.91	0.196	0.1787
16	6.75	0.380	0.54	0.83	0.205	0.1703
17	7.13	0.380	0.54	0.58	0.205	0.1190
18	7.51	0.365	0.50	0.25	0.183	0.0456
19	7.86	0.445	0.39	0.03	0.174	0.0052
20	8.40	0.270	0.00	0.00	0.000	0.0000
end	8.40					

Mean Depth (m)	0.35
Mean Velocity (m/s)	0.59

Discharge (m^3/s)	1.9346

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Upper Clinton Creek
Station Name:	R1
Date and Time:	Jul.23/2016, 15:15
Staff:	GR,NB
UTM Coordinates:	510718. 7147525
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.0/~19
Crossing Number	2

Ecological Logistics & Research Ltd.

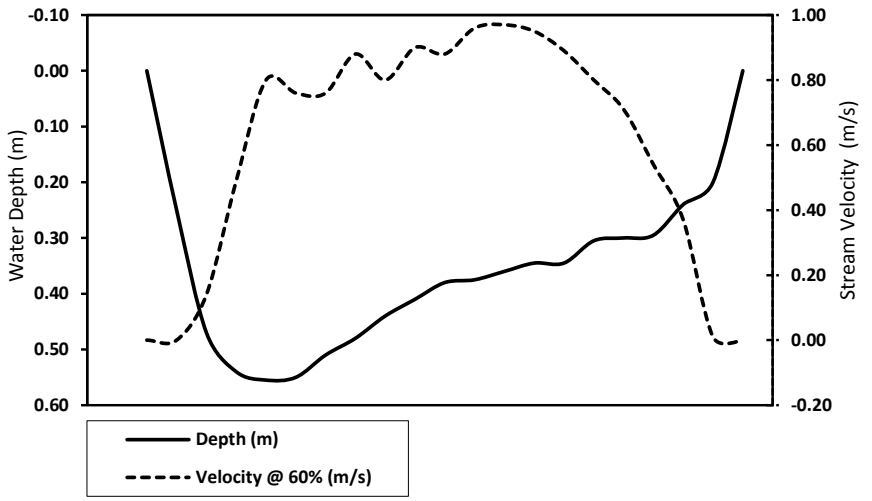
Left Bank	8.4
Right Bank	0.6
Wet.Width	7.8

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	8.40	0.120	0.00	0.00	0.000	0.0000
1	8.16	0.400	0.25	0.00	0.100	0.0000
2	7.60	0.470	0.47	0.14	0.221	0.0309
3	7.22	0.380	0.54	0.49	0.205	0.1005
4	6.84	0.380	0.56	0.80	0.211	0.1687
5	6.46	0.380	0.55	0.76	0.209	0.1588
6	6.08	0.380	0.51	0.76	0.194	0.1473
7	5.70	0.385	0.48	0.88	0.185	0.1626
8	5.31	0.390	0.44	0.80	0.172	0.1373
9	4.92	0.385	0.41	0.90	0.158	0.1421
10	4.54	0.380	0.38	0.88	0.144	0.1271
11	4.16	0.385	0.38	0.96	0.144	0.1386
12	3.77	0.390	0.36	0.97	0.140	0.1362
13	3.38	0.385	0.35	0.95	0.133	0.1262
14	3.00	0.380	0.35	0.89	0.131	0.1167
15	2.62	0.380	0.31	0.80	0.116	0.0927
16	2.24	0.380	0.30	0.71	0.114	0.0809
17	1.86	0.380	0.30	0.54	0.112	0.0605
18	1.48	0.380	0.24	0.37	0.091	0.0337
19	1.10	0.440	0.20	0.01	0.088	0.0009
20	0.60	0.250	0.00	0.00	0.000	0.0000
end	0.60					

Mean Depth (m)	0.35
Mean Velocity (m/s)	0.60

Discharge (m^3/s)	1.9618

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Easter Creek
Station Name:	R2
Date and Time:	Jul.23/2016, 16:46
Staff:	GR,NB
UTM Coordinates:	512023. 7148061
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	8.2/~19
Crossing Number	1

Ecological Logistics & Research Ltd.

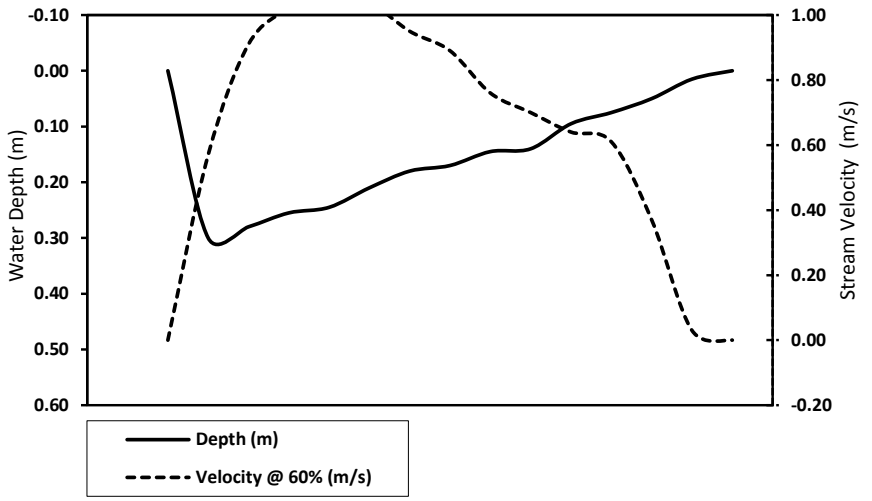
Left Bank	2.97
Right Bank	0.54
Wet.Width	2.43

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.97	0.095	0.00	0.00	0.000	0.0000
1	2.78	0.170	0.30	0.57	0.051	0.0291
2	2.63	0.160	0.28	0.91	0.045	0.0408
3	2.46	0.170	0.26	1.02	0.043	0.0442
4	2.29	0.170	0.25	1.08	0.042	0.0450
5	2.12	0.170	0.21	1.04	0.036	0.0371
6	1.95	0.170	0.18	0.95	0.031	0.0291
7	1.78	0.170	0.17	0.89	0.029	0.0257
8	1.61	0.175	0.15	0.76	0.025	0.0193
9	1.43	0.175	0.14	0.70	0.025	0.0172
10	1.26	0.170	0.10	0.64	0.016	0.0103
11	1.09	0.170	0.08	0.61	0.013	0.0078
12	0.92	0.170	0.05	0.37	0.009	0.0031
13	0.75	0.190	0.02	0.03	0.003	0.0001
14	0.54	0.105	0.00	0.00	0.000	0.0000
end	0.54					

Mean Depth (m)	0.14
Mean Velocity (m/s)	0.64

Discharge (m^3/s)	0.3087

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Easter Creek
Station Name:	R2
Date and Time:	Jul.23/2016, 16:46
Staff:	GR,NB
UTM Coordinates:	512023. 7148061
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	8.2/~19
Crossing Number	2

Ecological Logistics & Research Ltd.

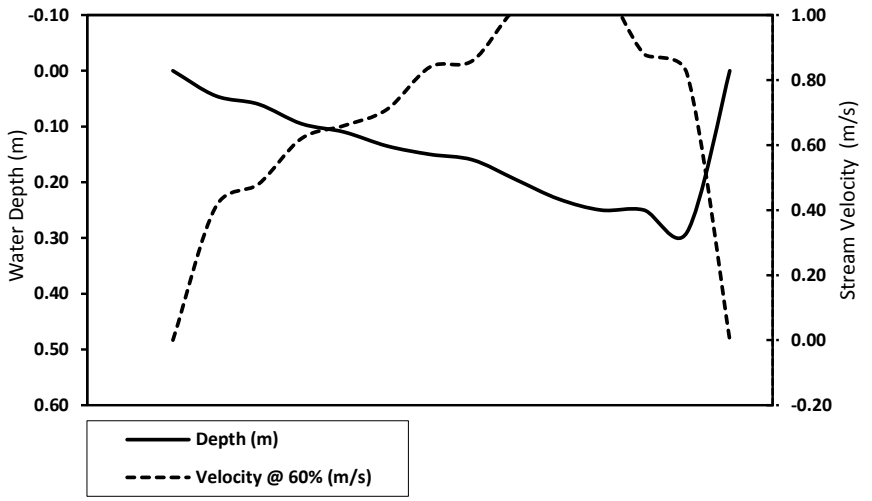
Left Bank	2.97
Right Bank	0.54
Wet.Width	2.43

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.54	0.160	0.00	0.00	0.000	0.0000
1	0.86	0.245	0.05	0.41	0.011	0.0045
2	1.03	0.170	0.06	0.48	0.010	0.0049
3	1.20	0.170	0.10	0.62	0.016	0.0100
4	1.37	0.170	0.11	0.66	0.019	0.0123
5	1.54	0.170	0.14	0.71	0.023	0.0163
6	1.71	0.170	0.15	0.84	0.026	0.0214
7	1.88	0.170	0.16	0.86	0.027	0.0234
8	2.05	0.170	0.20	1.02	0.033	0.0338
9	2.22	0.155	0.23	1.08	0.036	0.0385
10	2.36	0.155	0.25	1.09	0.039	0.0422
11	2.53	0.165	0.25	0.88	0.041	0.0363
12	2.69	0.220	0.29	0.82	0.064	0.0523
13	2.97	0.140	0.00	0.00	0.000	0.0000
end	2.97					

Mean Depth (m)	0.14
Mean Velocity (m/s)	0.68

Discharge (m^3/s)	0.2960

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	R3
Date and Time:	Jul.19/2016, 17:47
Staff:	GR,NB
UTM Coordinates:	513952. 7148677
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	7.7/~16
Crossing Number	1

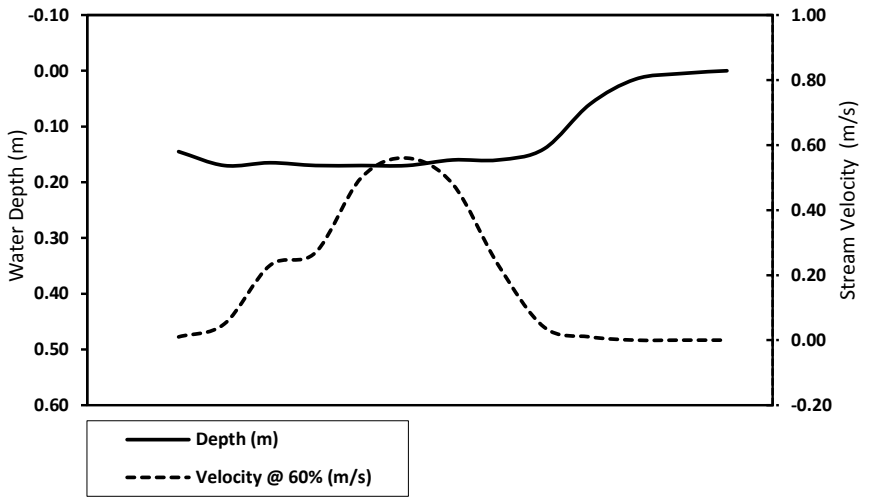
Left Bank	5.05
Right Bank	3.22
Wet.Width	1.83

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	3.22	0.055	0.15	0.01	0.008	0.0001
1	3.33	0.125	0.17	0.05	0.021	0.0011
2	3.47	0.145	0.17	0.23	0.024	0.0055
3	3.62	0.150	0.17	0.27	0.026	0.0069
4	3.77	0.155	0.17	0.50	0.026	0.0132
5	3.93	0.155	0.17	0.56	0.026	0.0148
6	4.08	0.160	0.16	0.48	0.026	0.0123
7	4.25	0.160	0.16	0.23	0.026	0.0059
8	4.40	0.150	0.14	0.04	0.021	0.0008
9	4.55	0.150	0.06	0.01	0.009	0.0001
10	4.70	0.160	0.02	0.00	0.002	0.0000
11	4.87	0.175	0.01	0.00	0.001	0.0000
12	5.05	0.090	0.00	0.00	0.000	0.0000
end	5.05					

Mean Depth (m)	0.12
Mean Velocity (m/s)	0.18

Discharge (m^3/s)	0.0606

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	R3
Date and Time:	Jul.19/2016, 17:47
Staff:	GR,NB
UTM Coordinates:	513952. 7148677
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	7.7/~16
Crossing Number	2

Ecological Logistics & Research Ltd.

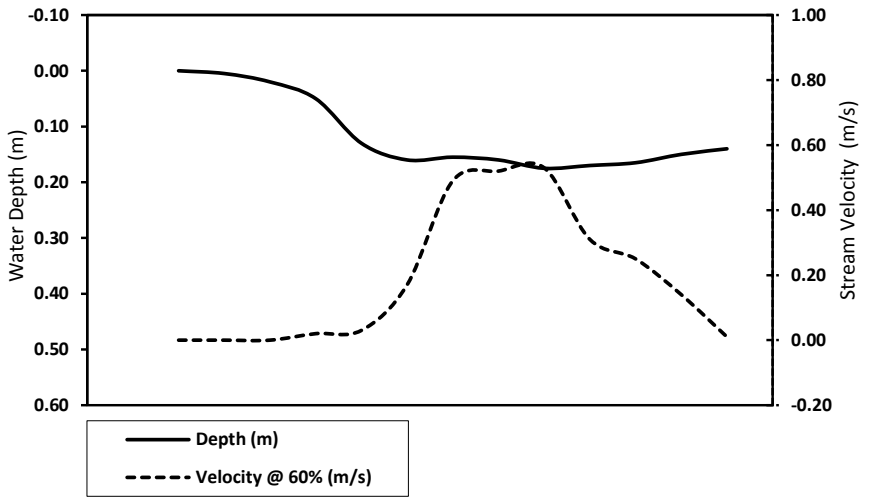
Left Bank	5.05
Right Bank	3.22
Wet.Width	1.83

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	5.05	0.085	0.00	0.00	0.000	0.0000
1	4.88	0.160	0.01	0.00	0.001	0.0000
2	4.73	0.155	0.02	0.00	0.003	0.0000
3	4.57	0.155	0.05	0.02	0.008	0.0002
4	4.42	0.155	0.13	0.03	0.020	0.0006
5	4.26	0.150	0.16	0.17	0.024	0.0041
6	4.12	0.145	0.16	0.49	0.022	0.0110
7	3.97	0.150	0.16	0.52	0.024	0.0125
8	3.82	0.150	0.18	0.53	0.026	0.0139
9	3.67	0.150	0.17	0.31	0.026	0.0079
10	3.52	0.150	0.17	0.25	0.025	0.0062
11	3.37	0.150	0.15	0.14	0.023	0.0032
12	3.22	0.075	0.14	0.01	0.011	0.0001
end	3.22					

Mean Depth (m)	0.11
Mean Velocity (m/s)	0.19

Discharge (m^3/s)	0.0596

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Eagle Creek
Station Name:	R4
Date and Time:	Jul.21/2016, 14:47
Staff:	GR,NB
UTM Coordinates:	515981. 7145344
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	4.9/~10
Crossing Number	1

Ecological Logistics & Research Ltd.

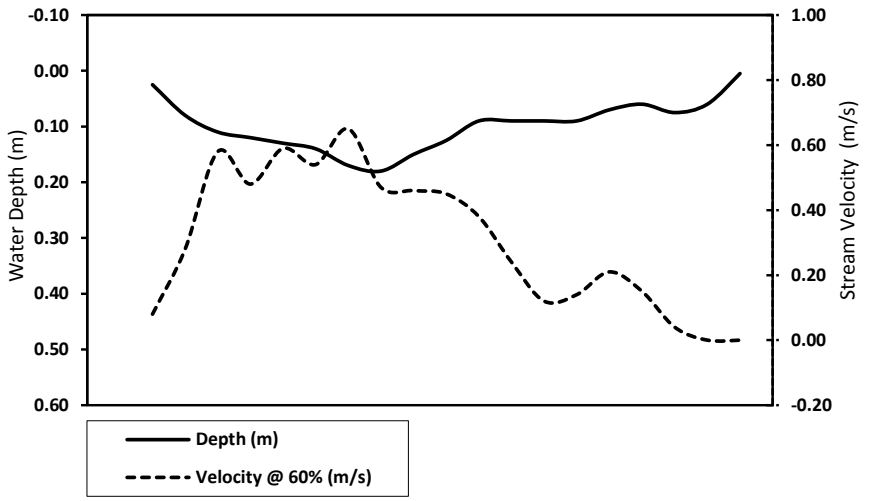
Left Bank	2.33
Right Bank	0.41
Wet.Width	1.92

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.41	0.050	0.03	0.08	0.001	0.0001
1	0.51	0.105	0.08	0.28	0.008	0.0024
2	0.62	0.105	0.11	0.58	0.012	0.0067
3	0.72	0.105	0.12	0.48	0.013	0.0060
4	0.83	0.110	0.13	0.59	0.014	0.0084
5	0.94	0.105	0.14	0.54	0.015	0.0079
6	1.04	0.105	0.17	0.65	0.018	0.0116
7	1.15	0.110	0.18	0.47	0.020	0.0093
8	1.26	0.105	0.15	0.46	0.016	0.0072
9	1.36	0.105	0.13	0.45	0.013	0.0059
10	1.47	0.105	0.09	0.38	0.009	0.0036
11	1.57	0.100	0.09	0.24	0.009	0.0022
12	1.67	0.105	0.09	0.12	0.009	0.0011
13	1.78	0.110	0.09	0.14	0.010	0.0014
14	1.89	0.105	0.07	0.21	0.007	0.0015
15	1.99	0.105	0.06	0.15	0.006	0.0009
16	2.10	0.110	0.08	0.04	0.008	0.0003
17	2.21	0.115	0.06	0.00	0.007	0.0000
18	2.33	0.060	0.01	0.00	0.000	0.0000
end	2.33					

Mean Depth (m)	0.10
Mean Velocity (m/s)	0.31

Discharge (m^3/s)	0.0767

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Eagle Creek
Station Name:	R4
Date and Time:	Jul.21/2016, 14:47
Staff:	GR,NB
UTM Coordinates:	515981. 7145344
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	4.9/~10
Crossing Number	2

Ecological Logistics & Research Ltd.

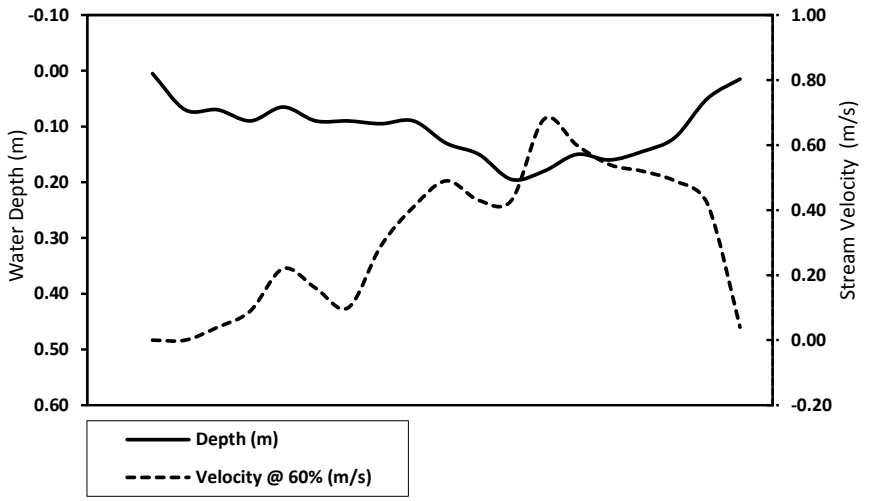
Left Bank	2.33
Right Bank	0.42
Wet.Width	1.91

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.33	0.055	0.01	0.00	0.000	0.0000
1	2.22	0.110	0.07	0.00	0.008	0.0000
2	2.11	0.105	0.07	0.04	0.007	0.0003
3	2.01	0.105	0.09	0.09	0.009	0.0009
4	1.90	0.110	0.07	0.22	0.007	0.0016
5	1.79	0.105	0.09	0.16	0.009	0.0015
6	1.69	0.105	0.09	0.10	0.009	0.0009
7	1.58	0.105	0.10	0.29	0.010	0.0029
8	1.48	0.105	0.09	0.41	0.009	0.0039
9	1.37	0.105	0.13	0.49	0.014	0.0067
10	1.27	0.105	0.15	0.43	0.016	0.0068
11	1.16	0.110	0.20	0.43	0.021	0.0092
12	1.05	0.105	0.18	0.68	0.019	0.0129
13	0.95	0.100	0.15	0.60	0.015	0.0090
14	0.85	0.105	0.16	0.54	0.017	0.0091
15	0.74	0.100	0.15	0.52	0.015	0.0075
16	0.65	0.100	0.12	0.49	0.012	0.0059
17	0.54	0.115	0.05	0.42	0.006	0.0024
18	0.42	0.060	0.02	0.04	0.001	0.0000
end	0.42					

Mean Depth (m)	0.10
Mean Velocity (m/s)	0.31

Discharge (m^3/s)	0.0814

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Porcupine Creek
Station Name:	R7
Date and Time:	Jul.20/2016, 14:08
Staff:	GR,NB
UTM Coordinates:	513026. 7145669
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.3/~15
Crossing Number	1

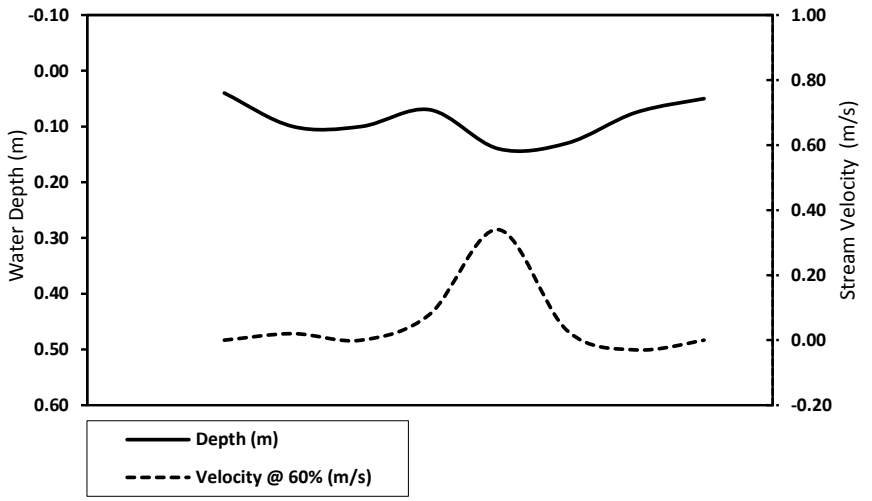
Left Bank	1.92
Right Bank	1.3
Wet.Width	0.62

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.30	0.045	0.04	0.00	0.002	0.0000
1	1.39	0.085	0.10	0.02	0.009	0.0002
2	1.47	0.085	0.10	0.00	0.009	0.0000
3	1.56	0.090	0.07	0.08	0.006	0.0005
4	1.65	0.090	0.14	0.34	0.013	0.0043
5	1.74	0.090	0.13	0.03	0.012	0.0004
6	1.83	0.090	0.08	-0.03	0.007	-0.0002
7	1.92	0.045	0.05	0.00	0.002	0.0000
end	1.92					

Mean Depth (m)	0.09
Mean Velocity (m/s)	0.06

Discharge (m^3/s)	0.0051

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Porcupine Creek
Station Name:	R7
Date and Time:	Jul.20/2016, 14:08
Staff:	GR,NB
UTM Coordinates:	513026. 7145669
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.3/~15
Crossing Number	1

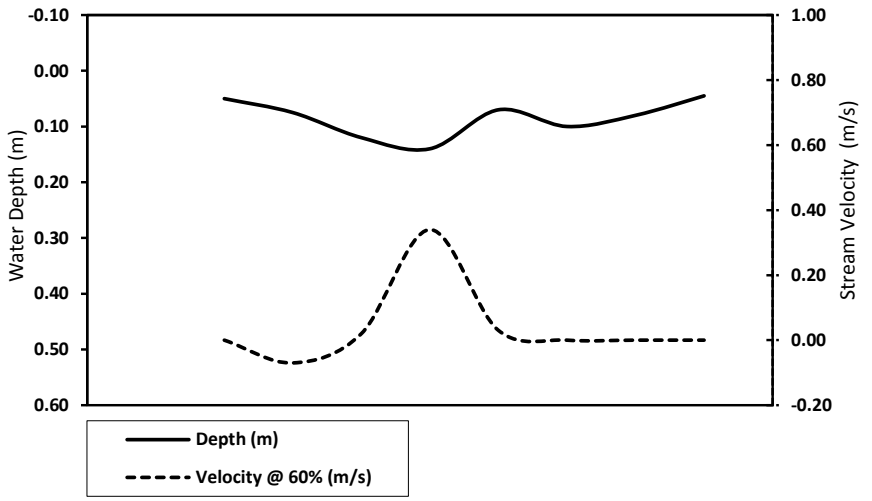
Left Bank	1.93
Right Bank	1.28
Wet.Width	0.65

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.93	0.050	0.05	0.00	0.003	0.0000
1	1.83	0.090	0.08	-0.07	0.007	-0.0005
2	1.75	0.090	0.12	0.02	0.011	0.0002
3	1.65	0.105	0.14	0.34	0.015	0.0050
4	1.54	0.095	0.07	0.03	0.007	0.0002
5	1.46	0.085	0.10	0.00	0.009	0.0000
6	1.37	0.090	0.08	0.00	0.007	0.0000
7	1.28	0.045	0.05	0.00	0.002	0.0000
end	1.28					

Mean Depth (m)	0.09
Mean Velocity (m/s)	0.04

Discharge (m^3/s)	0.0049

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R8
Date and Time:	Jul.23/2016, 17:47
Staff:	GR,NB
UTM Coordinates:	511885. 7147805
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.6/~20
Crossing Number	1

Ecological Logistics & Research Ltd.

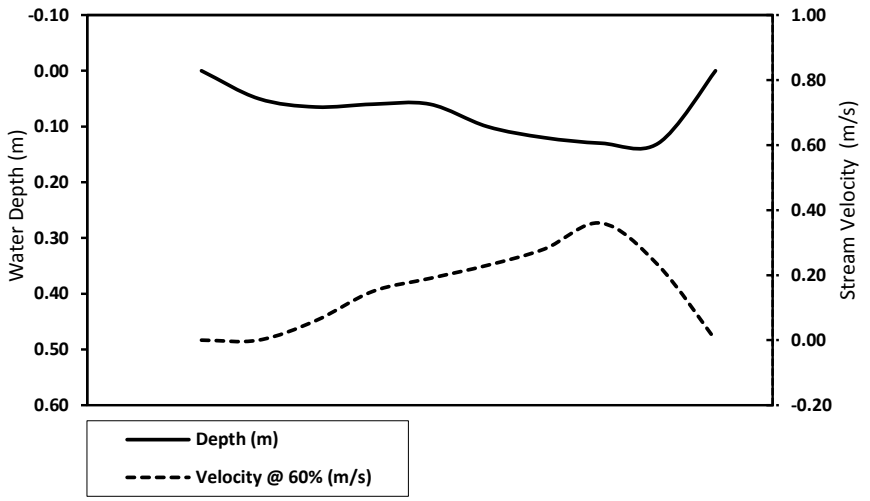
Left Bank	1.9
Right Bank	1.02
Wet.Width	0.88

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.02	0.080	0.00	0.00	0.000	0.0000
1	1.18	0.130	0.05	0.00	0.007	0.0000
2	1.28	0.090	0.07	0.06	0.006	0.0004
3	1.36	0.085	0.06	0.15	0.005	0.0008
4	1.45	0.100	0.06	0.19	0.006	0.0011
5	1.56	0.115	0.10	0.23	0.012	0.0026
6	1.68	0.105	0.12	0.28	0.013	0.0035
7	1.77	0.090	0.13	0.36	0.012	0.0042
8	1.86	0.065	0.13	0.23	0.008	0.0019
9	1.90	0.020	0.00	0.00	0.000	0.0000
end	1.90					

Mean Depth (m)	0.07
Mean Velocity (m/s)	0.15

Discharge (m^3/s)	0.0146

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R8
Date and Time:	Jul.23/2016, 17:47
Staff:	GR,NB
UTM Coordinates:	511885. 7147805
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.6/~20
Crossing Number	2

Ecological Logistics & Research Ltd.

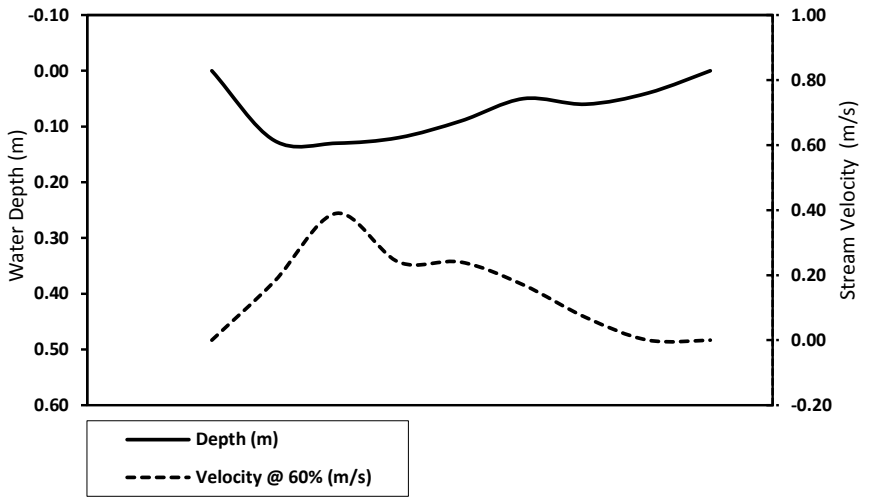
Left Bank	1.9
Right Bank	1.02
Wet.Width	0.88

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.90	0.025	0.00	0.00	0.000	0.0000
1	1.85	0.070	0.13	0.18	0.009	0.0016
2	1.76	0.110	0.13	0.39	0.014	0.0056
3	1.63	0.120	0.12	0.24	0.014	0.0035
4	1.52	0.110	0.09	0.24	0.010	0.0024
5	1.41	0.110	0.05	0.17	0.006	0.0009
6	1.30	0.110	0.06	0.07	0.007	0.0005
7	1.19	0.140	0.04	0.00	0.006	0.0000
8	1.02	0.085	0.00	0.00	0.000	0.0000
end	1.02					

Mean Depth (m)	0.07
Mean Velocity (m/s)	0.14

Discharge (m^3/s)	0.0144

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R9
Date and Time:	Jul.23/2016, 18:50
Staff:	GR,NB
UTM Coordinates:	512343. 7146753
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.0/~17
Crossing Number	1

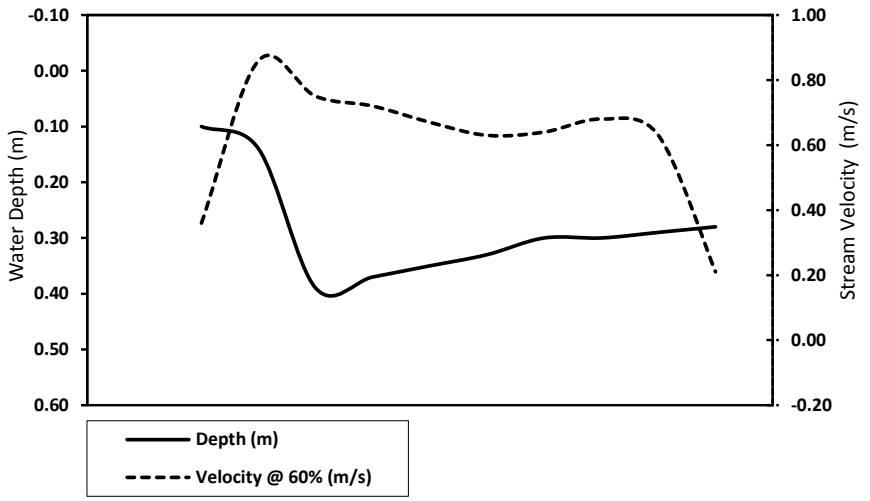
Left Bank	0.42
Right Bank	1.01
Wet.Width	0.59

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.42	0.030	0.10	0.36	0.003	0.0011
1	0.48	0.060	0.14	0.86	0.008	0.0072
2	0.54	0.060	0.39	0.75	0.023	0.0176
3	0.60	0.060	0.37	0.72	0.022	0.0160
4	0.66	0.070	0.35	0.67	0.025	0.0164
5	0.74	0.070	0.33	0.63	0.023	0.0146
6	0.80	0.060	0.30	0.64	0.018	0.0115
7	0.86	0.060	0.30	0.68	0.018	0.0122
8	0.92	0.075	0.29	0.63	0.022	0.0137
9	1.01	0.045	0.28	0.21	0.013	0.0026
end	1.01					

Mean Depth (m)	0.29
Mean Velocity (m/s)	0.62

Discharge (m^3/s)	0.1129

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R9
Date and Time:	Jul.23/2016, 18:50
Staff:	GR,NB
UTM Coordinates:	512343. 7146753
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.0/~17
Crossing Number	2

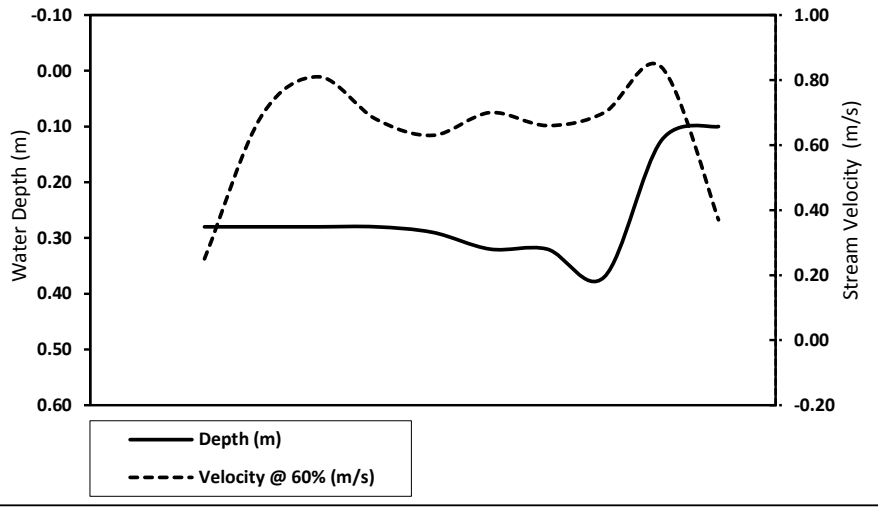
Left Bank	0.42
Right Bank	1.01
Wet.Width	0.59

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.01	0.035	0.28	0.25	0.010	0.0025
1	0.94	0.065	0.28	0.69	0.018	0.0126
2	0.88	0.060	0.28	0.81	0.017	0.0136
3	0.82	0.060	0.28	0.68	0.017	0.0114
4	0.76	0.060	0.29	0.63	0.017	0.0110
5	0.70	0.065	0.32	0.70	0.021	0.0146
6	0.63	0.070	0.32	0.66	0.022	0.0148
7	0.56	0.085	0.37	0.70	0.031	0.0220
8	0.46	0.070	0.13	0.84	0.009	0.0074
9	0.42	0.020	0.10	0.37	0.002	0.0007
end	0.42					

Mean Depth (m)	0.26
Mean Velocity (m/s)	0.63

Discharge (m^3/s)	0.1105

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R11
Date and Time:	Jul.19/2016, 15:55
Staff:	GR,NB
UTM Coordinates:	514165. 7147732
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.7/~16
Crossing Number	1

Ecological Logistics & Research Ltd.

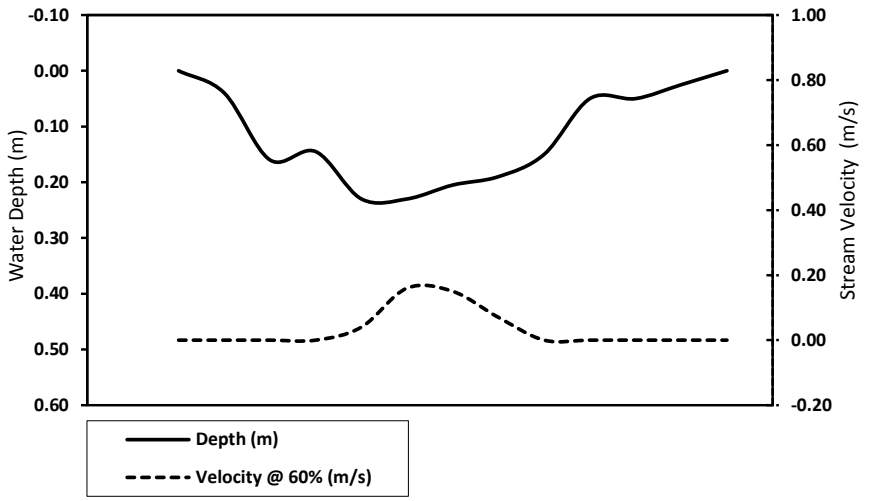
Left Bank	2.49
Right Bank	0.7
Wet.Width	1.79

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.70	0.075	0.00	0.00	0.000	0.0000
1	0.85	0.155	0.04	0.00	0.006	0.0000
2	1.01	0.145	0.16	0.00	0.023	0.0000
3	1.14	0.140	0.15	0.00	0.020	0.0000
4	1.29	0.150	0.23	0.04	0.035	0.0014
5	1.44	0.150	0.23	0.16	0.035	0.0055
6	1.59	0.150	0.21	0.15	0.031	0.0046
7	1.74	0.150	0.19	0.07	0.029	0.0020
8	1.89	0.150	0.15	0.00	0.023	0.0000
9	2.04	0.150	0.05	0.00	0.008	0.0000
10	2.19	0.140	0.05	0.00	0.007	0.0000
11	2.32	0.150	0.03	0.00	0.004	0.0000
12	2.49	0.085	0.00	0.00	0.000	0.0000
end	2.49					

Mean Depth (m)	0.11
Mean Velocity (m/s)	0.03

Discharge (m^3/s)	0.0135

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.3
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R11
Date and Time:	Jul.19/2016, 15:55
Staff:	GR,NB
UTM Coordinates:	514165. 7147732
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.7/~16
Crossing Number	2

Ecological Logistics & Research Ltd.

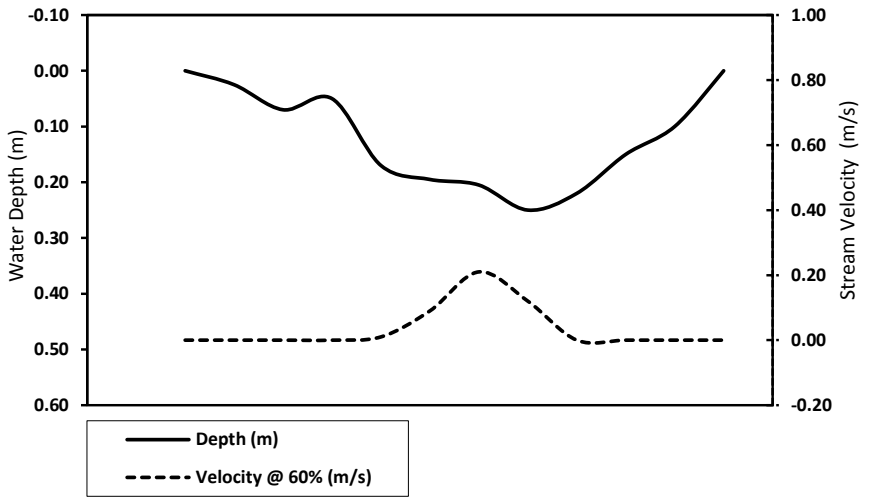
Left Bank	2.48
Right Bank	0.7
Wet.Width	1.78

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.48	0.090	0.00	0.00	0.000	0.0000
1	2.30	0.165	0.03	0.00	0.004	0.0000
2	2.15	0.150	0.07	0.00	0.011	0.0000
3	2.00	0.145	0.05	0.00	0.007	0.0000
4	1.86	0.150	0.17	0.01	0.026	0.0003
5	1.70	0.150	0.20	0.09	0.029	0.0026
6	1.56	0.145	0.21	0.21	0.030	0.0062
7	1.41	0.150	0.25	0.12	0.038	0.0045
8	1.26	0.145	0.22	0.00	0.032	0.0000
9	1.12	0.165	0.15	0.00	0.025	0.0000
10	0.93	0.210	0.10	0.00	0.021	0.0000
11	0.70	0.115	0.00	0.00	0.000	0.0000
end	0.70					

Mean Depth (m)	0.12
Mean Velocity (m/s)	0.04

Discharge (m^3/s)	0.0136

Plot of Channel Depth and Velocity Profile



APPENDIX 5
Survey Data

Hudgeon Lake Instruments

	Jul-15			Sep-15			Jan-16			Jun-16			Jul-16		
	m			m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	3.222	3.221	3.222	3.082	3.080	3.081	2.971	2.970	2.971	2.765	2.763	2.764	3.147	3.148	3.148
BM 2	2.659	2.658	2.659	2.519	2.520	2.520	2.408	2.407	2.408	2.119	2.119	2.119	2.502	2.502	2.502
BM3													2.058	2.058	2.058
Staff Gauge (SG)	4.130	4.129	4.130	3.994	4.000	3.997	4.011	4.012	4.012	3.478	3.479	3.479	3.864	3.864	3.864
Station Casing (SC)	3.616	3.616	3.616	1.316	1.316	1.316	3.419	3.418	3.419	3.188	3.188	3.188	3.569	3.569	3.569
BM1-BM2 difference			0.563			0.562			0.563			0.645			0.646
BM1-BM3 difference			-			-			-			-			1.090
BM2-BM3 difference			-			-			-			-			0.444
SG-BM1 difference			0.908			0.916			1.041			0.715			0.717
SG-BM2 difference			1.471			1.478			1.604			1.360			1.362
SG-BM3 difference			-			-			-			-			1.806
SC-BM1 difference			0.395			1.765			0.448			0.424			0.422
SC-BM2 difference			0.958			1.204			1.011			1.069			1.067
SC-BM3 difference			-			-			-			-			1.511

Wolverine Creek Instruments

	Oct-15			Jul-15			Jan-16			Jun-16			Jul-16		
	m			m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	1.304	1.304	1.304	0.947	0.948	0.948	1.119	1.119	1.119	0.951	0.952	0.952	0.944	0.946	0.945
BM 2	0.691	0.691	0.691	0.332	0.331	0.332	0.518	0.518	0.518	0.340	0.341	0.341	0.334	0.335	0.335
Staff Gauge (SG)	1.595	1.597	1.596	1.248	1.249	1.249	1.415	1.414	1.415	1.234	1.233	1.234	1.230	1.231	1.231
Station casing (SC)	0.694	0.694	0.694	0.337	0.337	0.337	0.520	0.521	0.521	0.357	0.357	0.357	0.348	0.349	0.349
BM1-BM2 Difference			0.613			0.616			0.601			0.611			0.611
BM1-BM3 difference			-			-			-			-			-
BM2-BM3 difference			-			-			-			-			-
SG-BM1 difference			0.292			0.301			0.296			0.282			0.286
SG-BM2 difference			0.905			0.917			0.897			0.893			0.896
SG-BM3 difference			-			-			-			-			-
SC-BM1 difference			0.610			0.611			0.599			0.595			0.597
SC-BM2 difference			0.003			0.006			0.002			0.017			0.014
SC-BM3 difference			-			-			-			-			-

Snowshoe Pit Lake Instruments

	Oct-15			Jul-15			Jan-16			Jun-16			Jul-16		
	m			m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	1.383	1.383	1.383	1.372	1.372	1.372	1.210	1.209	1.210	1.272	1.272	1.272	0.574	0.574	0.574
BM 2	1.295	1.294	1.295	1.282	1.282	1.282	1.122	1.122	1.122	1.182	1.182	1.182	0.484	0.484	0.484
Staff Gauge (SG)	1.38	1.387	1.384	1.369	1.368	1.369	1.202	1.202	1.202	1.267	1.269	1.268	0.568	0.569	0.569
Water Surface	2.895	2.873	2.884	-	-	0.994	-	-	-	3.070	3.070	3.070	1.962	1.963	1.963
BM1-BM2 Difference			0.089			0.090			0.087			0.090			0.090
SG-BM1 difference			0.000			0.004			0.008			0.004			0.005
SG-BM2 difference			0.089			0.087			0.080			0.086			0.085
SG-Water Difference			-1.501			0.375			-			-1.802			-1.394

SG Reading	**Reading (m)**	
July 30, 2015	0.375	
October 1, 2015	-0.501	Water level below bottom of gauge
June 17, 2016	-0.802	Water level below bottom of gauge
July 24, 2016	-0.394	Water level below bottom of gauge (measured after four days of heavy rain)
August 20, 2016	1.300	Approximate. Water level was above the top of the SG. Lots of recent rain
September 21, 2016	0.990	Approximate and based on a photo taken of the staff gauge. Water level dropped since August sampling event

APPENDIX 6
Response to Client Comments

Response to Comments from Draft Report Version (as Received November 8, 2016)

Comment No.	Page	Comment	Response
1	6	Table 3.1 indicates that GWCC-4 had a field dissolved oxygen measurement of 2.19 mg/L (i.e., outside of CCME range). Should this be included in Table 3 as an exceedance?	This measurement should have been included in the table and has been added.
2	6	Please include Site Condition heading	The site condition heading has been added.
3	6	Is this an accurate field reading? Field pH at this location in June was 8.16. On the field data collection sheet, no pH was recorded (just "PEN"). Field notes from other sites indicate that the pen was not calibrated. Do we believe this pH to be an accurate reflection of conditions at R4?	We've reviewed this field pH reading and agree that this and one other reading would be best removed from the dataset. We have updated our field data protocol for such cases.
4	6	Similar to above comment – is this considered an accurate field measurement? On the field data collection sheet, pH is noted as 6.80, and was also collected with the pen unit. June field pH was 7.76.	We've reviewed this field pH reading and agree that this and one other reading would be best removed from the dataset. We have updated our field data protocol for such cases.
5	7	To confirm – BM3 was installed during this field visit? Further, a recommendation in the June report included reinforcement of staff gauges at SL and E1(H) – was this completed in July?	BM3 was installed during the July program. Also, staff gauges were visited and checked during the July program. Upon checks by the staff who had installed them, no further work was deemed necessary at Snowshoe Pit, and the gauge at Site E1(H) was reinforced. The text has been updated accordingly for both cases.